Guidelines for Estimating Present & Projecting Future Population Distributions Surrounding Nuclear Facility Sites

REAFFIRMED

January 3, 2023

ANSI/ANS-2.6-2018 (R2023)

An American National Standard

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Guidelines for Estimating Present & Projecting Future Population Distributions Surrounding Nuclear Facility Sites

Secretariat
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Foreword

(This foreword is not a part of American National Standard "Guidelines for Estimating Present & Projecting Future Population Distributions Surrounding Nuclear Facility Sites," ANSI/ANS-2.6-2018, but is included for informational purposes.)

The purpose of this standard is to provide guidance in calculating the population sizes and densities surrounding all types of proposed nuclear facilities, such as non–light water nuclear reactors. The focus of this standard is the accurate assessment of demographic considerations for nuclear site selection regardless of the site's purpose.

The standard development ANS-2.6 Working Group (WG) identified several key objectives. First, while this standard's principal audience is the agencies and stakeholders of the United States, development of this standard to address international siting methodologies has merit. Therefore, this standard has been drafted as much as possible to apply equally to all users. This will enable the possible future development of an International Organization for Standardization (ISO) standard.

Second, the WG agreed that the scope of its standard did not include any reassessment or reconsideration of the regulatory parameters upon which demographic characteristics would be applied. Consequently, this standard does not address maximum dose or any of the other parameters that typically drive a nuclear facility siting regulation, including the boundaries for public safety purposes.

Third, the WG recognizes that a certain lack of specificity or quantification in demographic requirements provides for a more efficient and flexible siting process. However, the WG identified several places where a greater clarity in the language would improve the siting process. Therefore, this standard includes language designed to provide definitions and insights to such terms as "very densely populated centers," "weighted transient population," and other such unquantified terms.

Fourth, the WG recognized that one of the unintended consequences of nonspecific terminology is that it leaves a great deal of strategic room for presenting data without consideration of the intent of the language. For example, lower surrounding population densities are desired for nuclear facility sites, but for some sites lower population density is not a true reflection of the population distribution. A nuclear facility that is surrounded by large nonpopulated areas, such as water bodies, forests, park lands, and other nonhabitable areas, could produce misleading lower population densities. Identifying the urban areas within the study area provides additional context about the population distribution to decision makers, instead of relying solely upon the average population density metric in facility siting.

Finally, the WG recognized that the demographic requirements in the regulations and guidance of the United States were written by professionals at a time when data were difficult to manage and manipulate. This has resulted in the current regulations being out of date technologically as well as technically. Consequently, this standard provides insight into modern geographic information system (GIS) tools and demographic data gathering techniques with an emphasis on the utility of readily available tools and databases from relevant governmental agencies (e.g., U.S. Census Bureau or Census Canada).

Accordingly, the intent of this standard is to benefit the private- and public-sector U.S. nuclear industries, the regulators and federal agencies that oversee their activities, and the people of the United States, with the assurance that the siting of any nuclear facility has been performed with the full consideration of that site's public safety and security. This standard establishes that assurance by providing consistency across the United States' nuclear facility siting using the most recent data and geographic tools available while still

allowing for flexibility in application due to professional judgment. Additionally, this standard has been crafted to offer a defined methodology to regulators and nuclear enterprises in foreign countries with demographic requirements that can be readily adapted to the specific regulatory requirements of that host country.

This standard contains four appendices to detail some of the standard body information, including bibliographical references for each appendix. Appendix A provides a literature search of regulations and guidance on similar topics. Appendices B and C include instructional materials for users unfamiliar with some of the basic geospatial and demographic terminology. Appendix D offers a description of the most commonly used computer-based GIS programs at the time this standard was written that facilitate the visualization and assessment of geospatial data.

Inclusion of any specific GIS program or mapping system in this standard or its appendices should not be construed as promotion of or support for that product by the American Nuclear Society or the American National Standards Institute.

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.

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