American Nuclear Society

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Nuclear Analysis and Design
of Concrete Radiation Shielding
for Nuclear Power Plants

an American National Standard

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American National Standard for Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants

Secretariat
American Nuclear Society

Prepared by the
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Standards Committee
Working Group ANS-6.4

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American National Standard

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Foreword

(This Foreword is not a part of American National Standard for Nuclear Analysis and Design of Concrete Radiation Shielding for Nuclear Power Plants, ANSI/ANS-6.4-1997.)

The need for this standard was identified in mid-1972 by D. K. Trubey, then chairman of Subcommittee ANS-6, Radiation Protection and Shielding. The then-existing standard, ANSl N101.6-1972, "Concrete Radiation Shields," provided excellent guidance on the construction of concrete radiation shielding structures, but contained almost no information on shielding effectiveness or analysis. This standard was first issued as ANSI/ANS-6.4-1977 (N403).

After ANSI/ANS-6.4-1977 was issued, two significant events occurred that led to the decision to revise the standard: ANSI N101.6-1972 was withdrawn by ANSI, and the American Concrete Institute (ACI) issued its standard ACI 349-80, "Code Requirements for Nuclear Safety Related Concrete Structures," as well as the Commentary ACI 349R-80, which provided updated requirements with regard to the construction aspects of concrete shielding structures. The withdrawal of ANSI N101.6-1972, the guidance provided by ACI 349-80, and advances in the evolution of shielding methods, data, and applications, led to the revision, ANSI/ANS-6.4-1985.

Since that revision effort, there have been a number of other advances, particularly with respect to buildup factors. These advances have prompted this newest revision, ANSI/ ANS-6.4-1997.

This revised standard is meant to be a "guide to good practice" in the area of concrete shielding analysis and design. Recommendations are given where possible, but more often the choice of analytical methods must be left to the discretion of the shielding engineer as appropriate to the particular job, whether it be a conceptual design or final construction drawing.

This standard was revised by Working Group ANS-6.4 of the American Nuclear Society, which had the following members at the time it prepared and approved this standard:

J. L. Kamphouse, Chairman, *Tennessee Valley Authority*
R. J. Donahue, *Lawrence Berkeley National Laboratory*
S. J. Haynes, *Washington Public Power Supply System*
A. R. Larson, *Bechtel Corporation*
R. W. Roussin, *Oak Ridge National Laboratory*
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Consensus Committee N-17, Research Reactors, Reactor Physics, Radiation Shielding, and Computational Methods, had the following membership at the time it reviewed and approved this standard:

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