

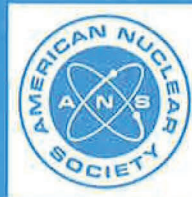
American Nuclear Society

WITHDRAWN

program for testing radiation shields in
light water reactors (LWR)

an American National Standard

No longer being maintained as an American National Standard. This standard may contain outdated material or may have been superseded by another standard. Please contact the ANS Standards Administrator for details.



published by the
American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60525 USA

ANSI/ANS-6.3.1-1980

**American National Standard
Program for Testing Radiation Shields
in Light Water Reactors (LWR)**

**Secretariat
American Nuclear Society**

**Prepared by the
American Nuclear Society
Standards Committee
Working Group ANS-6.3**

**Published by the
American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60525 USA**

**Approved July 3, 1980
by the
American National Standards Institute, Inc.**

American National Standard

An American National Standard implies a consensus of those substantially concerned with its scope and provisions. An American National Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an American National Standard does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. American National Standards are subject to periodic review and users are cautioned to obtain the latest editions.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of publication. Purchasers of this standard may receive current information, including interpretation, on all standards published by the American Nuclear Society by calling or writing to the Society.

Published by

**American Nuclear Society
555 North Kensington Avenue, La Grange Park, Illinois 60525 USA**

Price: \$20.00

Copyright © 1980 by American Nuclear Society.

Any part of this standard may be quoted. Credit lines should read "Extracted from American National Standard ANSI/ANS-6.3.1-1980 with permission of the publisher, the American Nuclear Society." Reproduction prohibited under copyright convention unless written permission is granted by the American Nuclear Society.

Printed in the United States of America

Foreword

(This Foreword is not a part of American National Standard Program for Testing Radiation Shields in Light Water Reactors (LWR), ANSI/ANS-6.3.1-1980.)

Working Group ANS-6.3 of the American Nuclear Society Standards Committee was originally formed with the objective of developing standards for an operational shield test program to be used in evaluating installed biological shielding in nuclear power plants. The standard was prepared in 1972 and was adopted as American National Standard Program for Testing Biological Shielding in Nuclear Reactor Plants, N18.9-1972 (ANS-6.3). The N18.9-1972 document was endorsed in the NRC Regulatory Guide 2.1, "Shield Test Program for the Evaluation of Installed Biological Shielding in Research and Training Reactors," and issued in May 1973.

In the latter part of 1973, Working Group ANS-6.3 was reorganized with the objective to develop a standard for a radiation shield testing program of reactor power plants. The committee working sessions were convened on an almost quarterly basis and included two field trips: (1) Davis-Besse Power Station, Toledo Edison Co., Toledo, Ohio, July 1975, and (2) Dresden Plant Units, Commonwealth Edison Co., Chicago, Illinois, February 1976.

1. The purpose of the Davis-Besse Nuclear Power Station field trip was to inspect the shield and plant layout relating to methods and procedures of the shield testing program being developed for the standard. The completion phase of construction allowed the committee a very instructive insight and this experience has been reflected in the standard.

2. The Dresden Plant visit was for the purpose of studying the methods, procedures and problems of shielding and radiation survey programs in an actual operating power plant. The on-site study of the plant layout and the mechanics of carrying out the survey programs was found to be an effective experience and has been incorporated into the standard.

This standard was prepared by Working Group ANS-6.3 of the Standards Committee of the American Nuclear Society, which had the following membership at the time of its approval of this standard:

P. J. Persiani, Chairman, *Argonne National Laboratory*
D. W. Briden, *Toledo Edison Company*
W. O. Chatfield, *Stone & Webster Engineering Corporation*
W. L. Duke, *Commonwealth Edison Company*

D. Foreman, *Sargent and Lundy, (Currently with General Electric Co.)*
T. D. Murphy, *U.S. Nuclear Regulatory Commission*
R. A. Pavlick, *Commonwealth Edison Company*
T. E. Todd, *Tennessee Valley Authority*

The membership of Subcommittee ANS-6 at the time of its approval of this standard was:

D. K. Trubey, Chairman, *Oak Ridge National Laboratory*
George G. Biro, *Gibbs & Hill, Inc.*
J. Celnik, *Burns & Roe*
D. R. Harris, *Rensselaer Polytechnic Institute*
H. E. Hungerford, *Purdue University*

E. Normand, *Sargent and Lundy*
P. J. Persiani, *Argonne National Laboratory*
D. J. Schuh, II, *Fabricated Systems Incorporated*
E. A. Warman, *Stone & Webster Engineering Corporation*

The American National Standards Committee N17, Research Reactors, Reactor Physics, and Radiation Shielding, had the following membership when it reviewed and approved this standard:

W. L. Whittemore, Chairman
 R. S. Carter, Secretary

<i>Organization Represented</i>	<i>Name of Representative</i>
American College of Radiology	M. M. TerPogossian
American Institute of Chemical Engineers	R. Duffy
American Nuclear Society	W. L. Whittemore
American Physical Society	W. W. Havens
	H. Goldstein (Alt.)
American Public Health Association	W. A. Holt
American Society of Mechanical Engineers	R. A. Axford
American Society of Radiologic Technologists	J. H. Tolan
Health Physics Society	C. A. Willis
Institute of Electrical & Electronics Engineers	E. A. Corte
National Bureau of Standards	R. S. Carter
	T. M. Raby (Alt.)
National Council on Radiation Protection & Measurement	A. B. Chilton
U.S. Nuclear Regulatory Commission	R. W. Reid
	R. J. Schemel (Alt.)
U.S. Department of Energy	P. B. Hemmig
	J. W. Lewellen (Alt.)
Individual Members	J. E. Olhoeft
	E. A. Warman

Contents	Section	Page
1.	Introduction	1
2.	Scope	1
3.	Definitions	1
	3.1 Limitations	1
	3.2 Shall, Should, and May	1
	3.3 Glossary of Terms	1
4.	Objective of Test Program	2
5.	Radiation Shield Testing Program	2
	5.1 General	2
	5.2 Selection of Locations of Measurements	2
	5.3 Methods of Measurements	4
	5.4 Shield Testing Phases	7
	5.5 Relation of the Radiation Shield Testing Program to Other Routine Operating Radiation Survey Programs	11
6.	Instrumentation	11
	6.1 General Characteristics	11
	6.2 Gamma-ray Instrumentation	11
	6.3 Neutron Instrumentation	12
	6.4 Other Shield Test Dosimetry	12
7.	Administrative Practices	12
	7.1 Program Feedback and Comparison	12
	7.2 Administrative Controls	13
	7.3 Data Collection	13
	7.4 Data Analysis	13
	7.5 Records	13
8.	References	16
Tables		
	Table 7.3 Shield Test Data Sheet	14
	Table 7.4 Data Analysis Sheet	15
Figures		
	Fig. 1 Radiation Base Point (RBP) Symbol	3
	Fig. 2a Horizontal Shield (Plan View) Suggested Scanning Method (A)	5
	Fig. 2b Horizontal Shield (Plan View) Suggested Scanning Method (B)	6
	Fig. 3 Vertical Shield (Elevation View) Suggested Scanning Method	8