## **American Nuclear Society**

nuclear power plant simulators for use in operator training

an American National Standard

WITHDRAWN

ANSI/ANS



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

American National Standard Nuclear Power Plant Simulators for Use in Operator Training

Secretariat
American Nuclear Society

Prepared by the American Nuclear Society Standards Committee Working Group ANS-3.5

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

Approved October 25, 1985 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CAUTION NOTICE: This American National Standard may be reviewed or withdrawn at any time.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

Copyright@1985 by American Nuclear Society.

Any part of this standard may be quoted. Credit lines should read "Extracted from American National Standard ANSI/ANS-3.5-1985 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

(This Foreword is not a part of American National Standard Nuclear Power Plant Simulators for Use in Foreword Operator Training, ANSI/ANS-3.5-1985.)

> Nuclear power plant simulators have become an important tool in training of nuclear power plant operators. Acceptance of the use of simulators in operator training programs has resulted in the need for a standard describing the minimum configuration and performance of such a unit. The objective of the standard is to specify minimum simulator performance and configuration criteria necessary for effective training.

> It is not the intent of this standard to imply that a simulator is necessary for an effective operator training program. It is the responsibility of the individual organizations to establish a program to prepare the staff properly to operate and maintain the nuclear facility, and how the job is accomplished must be determined by each party.

> The standard has been revised to incorporate expanding knowledge concerning the capabilities, use, design, and updating of nuclear power plant simulators that has been developed in the years since the previous revision. Consideration has been given to the effects of improvements made in simulators. Appendices have been provided to aid users in maintaining simulator data and in testing of simulators.

> When a simulator is used in an operator training program, it shall meet the requirements set forth in this standard.

> Working Group ANS-3.5 of the Standards Committee of the American Nuclear Society had the following membership:

- N. S. Elliott, Chairman, Babcock & Wilcox Company
- J. C. Velotta, Vice-Chairman, Florida Power & Light Company
- T. Dennis, Secretary, Public Service Electric & Gas Company
- J. M. Black, Northeast Utilities Service Company
- B. A. Boger, U.S. Nuclear Regulatory Commission J. H. Harris, Commonwealth Edison Company
- R. A. Johnson, Interfacts, Inc.
- J. W. Lehner, Tennessee Valley Authority
- M. F. Reisinger, Electronic Associates, Inc.
- P. J. Swanson, The Singer Company
- D. L. Thames, General Physics Corporation
- G. H. Wanner, Interfacts, Inc.
- R. M. Wyatt, Institute of Nuclear Power Operations

Certain highly technically qualified individuals provided additional expert assistance and advice to the working group during the development of the standard. They are:

- W. F. Fernow, Arizona Public Service Company
- W. M. Guinn, Institute of Nuclear Power Operations
- P. M. Haas, Oak Ridge National Laboratory
- J. P. Jankovich, U.S. Nuclear Regulatory Commission
- N. B. Kraje, Babcock & Wilcox Company
- E. W. Merschoff, U.S. Nuclear Regulatory Commission
- J. P. Sursock, Electric Power Research Institute

Subcommittee ANS-3, Reactor Operations, had the following membership at the time of its approval of this standard:

- W. T. Ullrich, Chairman, Philadelphia Electric
- D. H. Beckham, U.S. Nuclear Regulatory Commission
- F. A. Dougherty, Utility Services
- N. S. Elliott, Babcock & Wilcox Company
- T. W. Fitzgerald, American Nuclear Insurers
- H. J. Green, Tennessee Valley Authority
- E. Jackson, Vermont Yankee Nuclear Power Cor-
- T. Murray, Toledo Edison

- V. Poeppelmeier, Institute of Nuclear Power Operations R. J. Rodriquez, Sacramento Municipal Utility District
- D. Roth, General Physics Corporation
- J. D. Shiffer, Pacific Gas & Electric Company
- J. E. Smith, Duke Power Company
- J. M. Taylor, U.S. Nuclear Regulatory Commission
- P. F. Walzer, Public Service Electric & Gas Company
- G. K. Whiteham, Argonne National Laboratory

The American Nuclear Society's Nuclear Power Plant Standards Committee (NUPPSCO) had the following membership at the time of its approval of this standard.

## L. J. Cooper, Chairman M. D. Weber, Secretary

Name of Representative	Organization Represented
R. V. Bettinger F. Boorboor W. S. Brown C. O. Coffer L. J. Cooper	Jnited Engineers and Constructors, Incorporated
J. D. Crawford	
C. J. Gill	U.S. Nuclear Regulatory Commission Rockwell International Corporation
J. F. Mallay L. M. Mills P. T. Reichert W. M. Rice	
M. O. Sanford	(for the Institute of Electrical and Electronics Engineers, Inc.)GPU Nuclear Corporation
J. E. Smith	
T. J. Sullivan	(for the American Society of Civil Engineers)
W. T. Ullrich. G. P. Wagner. G. L. Wessman	
J. E. Windhorst	Southern Company Services

<b>Contents</b>	Section	
	1.	Scope
	2.	Definitions
	3.	General Requirements
	4.	Performance Criteria
	5.	Simulator Design Control
	6.	References
	Ap	pendices
		Appendix A Guide for Documenting Simulator Performance