American Nuclear Society

WITHDRAWN

May 14, 2017 ANSI/ANS-55.4-1993 (R2007) (W2017) gaseous radioactive waste processing systems for light water reactor plants

an American National Standard

This standard has been reviewed and reaffirmed with the recognition that it may reference other standards and documents that may have been superseded or withdrawn. The requirements of this document will be met by using the version of the standards and documents referenced herein. It is the responsibility of the user to review each of the references and to determine whether the use of the original references or more recent versions is appropriate for the facility. Variations from the standards and documents referenced in this standard should be evaluated and documented.

This standard does not necessarily reflect recent industry initiatives for risk informed decisionmaking or a graded approach to quality assurance. Users should consider the use of these industry initiatives in the application of this standard.

REAFFIRMED

November 19, 1999 ANSI/ANS-55.4-1993 (R1999) May 14, 2007 ANSI/ANS-55.4-1993 (R2007)

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 This standard may contain outdated material or may have been superseded by another standard.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

American National Standard for Gaseous Radioactive Waste Processing Systems for Light Water Reactor Plants

Secretariat
American Nuclear Society

Prepared by the American Nuclear Society Standards Committee Working Group ANS-55.4

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

Approved July 16, 1993 by the American National Standards Institute, Inc.

American National Standard

Designation of this document as an American National Standard attests that the principles of openness and due process have been followed in the approval procedure and that a consensus of those directly and materially affected by the standard has been achieved.

This standard was developed under the procedures of the Standards Committee of the American Nuclear Society; these procedures are accredited by the American National Standards Institute, Inc., as meeting the criteria for American National Standards. The consensus committee that approved the standard was balanced to ensure that competent, concerned, and varied interests have had an opportunity to participate.

An American National Standard is intended to aid industry, consumers, governmental agencies, and general interest groups. Its use is entirely voluntary. The existence of an American National Standard, in and of itself, does not preclude anyone from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard.

By publication of this standard, the American Nuclear Society does not insure anyone utilizing the standard against liability allegedly arising from or after its use. The content of this standard reflects acceptable practice at the time of its approval and publication. Changes, if any, occurring through developments in the state of the art, may be considered at the time that the standard is subjected to periodic review. It may be reaffirmed, revised, or withdrawn at any time in accordance with established procedures. Users of this standard are cautioned to determine the validity of copies in their possession and to establish that they are of the latest issue.

The American Nuclear Society accepts no responsibility for interpretations of this standard made by any individual or by any ad hoc group of individuals. Requests for interpretation should be sent to the Standards Department at Society Headquarters. Action will be taken to provide appropriate response in accordance with established procedures that ensure consensus on the interpretation.

Comments on this standard are encouraged and should be sent to Society Headquarters.

Published by

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

Copyright © 1994 by American Nuclear Society.

Any part of this standard may be quoted. Credit lines should read "Extracted from American National Standard ANSI/ANS-55.4-1993 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 for Gaseous Radioactive Waste Processing Systems for Light Water Reactor Plants, ANSI/ANS-55.4-1993, but is included for information purposes only.)

Management of the gaseous radioactive waste generated as a by-product of nuclear power plant operation constitutes a major management responsibility. Quantities of gaseous radioactive waste generated during operation are dependent upon several factors including design conditions, type of equipment, equipment arrangements, and operating philosophy.

The purpose of this standard is to establish uniform practices and minimum requirements for design, construction, and performance, with due consideration for operation, of gaseous radioactive waste processing systems. The standard sets forth design, construction, and performance requirements for acceptable gaseous radioactive waste processing systems. Adherence by system designers to the criteria contained in the standard will enable the operator (a) to control to regulatory levels radiation exposures to operating personnel; (b) to assure a low probability of unplanned release of radioactivity from the system; and (c) to control system releases of radioactivity to levels as low as reasonably achievable.

In accordance with ANS policy to maintain standards on a five year basis, the standard was revised to update its contents and to reflect changes in industry practices. Members of Working Group 55.4, and their affiliations at the time of their approval of this standard, were as follows:

- F. W. Hartley, Chairman, Management Analysis Company
- J. A. Battaglia, Westinghouse Electric Corporation
- D. H. DaCosta, Ergenics, Incorporated
- S. A. Lamanna, The Babcock & Wilcox Company
- J. Lee, U.S. Nuclear Regulatory Commission
- G. A. Tidrick, Pacific Gas & Electric Company

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

W. T. Ullrich, Chairman

M. D. Weber, Secretary

W. M. Andrews Southern Company Services, Inc.
F. Boorboor Impell Corporation
C. O. Coffer Pacific Gas & Electric Company
L. J. Cooper Nebraska Public Power District
J. D. Crawford
W. H. D'Ardenne (Vice Chairman)
S. N. Ehrenpreis Westinghouse Electric Corporation
S. B. Gerges
C. J. Gill Bechtel International Corporation
M. L. Hellums
C. E. Johnson
R. T. Lancet
J. C. McCall Tennessee Valley Authority
J. F. Mallay
R. E. Miller
J. A. Nevshemal
P. T. Reichert Stearns Catalytic, Inc.
B. M. Rice
(for the Institute of Electrical & Electronics Engineers, Inc.)
J. C. Saldarini Ebasco Services, Inc.
M. O. Sanford
S. I. Stamm Stone & Webster Engineering Corporation
J. D. Stevenson Stevenson & Associates
(for the American Society of Civil Engineers)
T. J. Sullivan Institute of Nuclear Power Operations
C. D. Thomas, Jr Yankee Atomic Electric Company
W. T. Ullrich Philadelphia Electric Company
(for the American Nuclear Society)
G. P. Wagner
G. L. Wessman Torrey Pines Technology
G. J. Wrobel Rochester Gas & Electric Corporation

Contents	Section Pa	age
	1. Scope and System Description 1.1 Scope	. 1
	2. Definitions	. 1
	3. Criteria	. 2 . 2
	4. Design Requirements 4.1 Code Classification 4.2 Seismic Design 4.3 Quality Assurance 4.4 Materials 4.5 Welding 4.6 Sampling 4.7 Design for Explosive Conditions 4.8 Provisions for Calibration and Testing 4.9 Leak Tightness 4.10 Charcoal Adsorption Parameters 5. Process and Equipment Requirements 5.1 Process Requirements	2 2 2 2 3 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4
	5.2 Equipment Requirements 5.3 System Arrangement 5.4 Controls and Instrumentation 5.5 Process and Effluent Radiation Monitoring	6 7 8
	6. Redundancy and Pre-Operational Requirements 6.1 Redundancy 6.2 Pre-Operational Testing and Cleaning	10
·	7. References	10
	Figures	
	Figure 1 Typical BWR Gaseous Radioactive Waste Processing Systems Figure 2 Typical PWR Tank Storage System	12 13
	Figure 4 Use with Volume Control Tank Stripping Figure 4 Typical PWR Volume Reduction Extended Storage System for	14
	Use with CVCS Stripping	15 16