American Nuclear Society

WITHDRAWN

May 14, 2017

ANSI/ANS-55.6-1993 (R2007) (W2017)

liquid radioactive waste processing system for light water reactor plants

an American National Standard

REAFFIRMED

May 14, 2007

ANSI/ANS-55.6-1993 (R2007)

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reviewed and reaffirmed with the recognition that it may reference other standards and documents that may have been superseded or withdrawn.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.
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published by the
American Nuclear Society
555 North Kensington Avenue
La Grange Park, Illinois 60525 USA

ANSI/ANS-55.6-1993

American National Standard for Liquid Radioactive Waste Processing System for Light Water Reactor Plants

Secretariat
American Nuclear Society

Prepared by the
American Nuclear Society
Standards Committee
Working Group ANS-55.6

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.

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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

Printed in the United States of America

Foreword

(This foreword is not a part of American National Standard for Liquid Radioactive Waste Processing System for Light Water Reactor Plants, ANSI/ANS-55.6-1993, but is included for information purposes only.)

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

The purpose of this standard is to establish uniform practices and set forth minimum requirements for design, construction, and performance, with due consideration for operation, for acceptable liquid radioactive waste handling and processing systems. Adherence by system designers to the criteria contained in the standard will enable the operator: (a) to control to within regulatory levels radiation exposures to operating personnel; (b) to assure a low probability of accidental 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 55.6, 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, Inc.*
S. A. Lamanna, *The Babcock & Wilcox Company*
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:

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W. T. Ullrich ..... Philadelphia Electric Company
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G. P. Wagner ..... Commonwealth Edison Company
G. L. Wessman ..... Torrey Pines Technology
G. J. Wrobel ..... Rochester Gas & Electric Corporation

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Liquid Radioactive Waste Processing System for Light Water Reactor Plants

1. Scope and System Description

1.1 Scope. This standard sets forth minimum design, construction, and performance requirements, with due consideration for operation, of the Liquid Radioactive Waste Processing System (LRWPS) for light water reactor (LWR) plants for design basis inputs. It is applicable to routine operation, including design basis fuel leakage and other design basis occurrences.

1.2 System Description. For the purpose of this standard, the LRWPS begins at the interfaces with the reactor coolant system pressure boundary, at the points of discharge for lines from other systems or at the discharge from the building sumps that are provided for the collection of liquid waste that has the potential of containing radioactive material. The system excludes drywell sumps and safety-related systems. The system terminates at the point of controlled discharge to the environment, at the point of interface with the waste solidification system, and at the point of recycle back to storage for reuse.

The LRWPS components are nonnuclear safety related and the system is classified as Nonnuclear Safety (NNS). See Section 3.3 of both American National Standard for Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants, ANSI/ANS-51.1-1983 (R1988) [1],[1] and American National Standard for Nuclear Safety Criteria for the Design of Stationary Boiling Water Reactor Plants, ANSI/ANS-52.1-1983 (R1988) [2], for definitions of "Safety Class" and "Nonnuclear Safety."

2. Definitions

chemical wastes. Liquid radioactive wastes having high conductivity (>200 microsiemens), variable insoluble solids content, variable radioactivity content, and not containing soaps, detergents, oils, or similar organic materials.

controlled area. That portion of a nuclear facility, including outside yard areas, enclosed equipment, systems, and facilities, which may contain radio-active material by definition or design. Controlled area does not normally, but may temporarily, include portions of secondary system areas of the plant.

crud. Insoluble particulate materials in the process streams.

decontamination factor (DF). The ratio of the concentration of the radioactive material in the influent stream to its concentration in the effluent.

decontamination wastes. Liquid radioactive wastes generated by decontamination of radioactive plant components, equipment, and tools, other than personnel protective clothing and equipment.

deep bed plants. Those plants utilizing deep bed demineralizers in the condensate polishing system.

design basis radioactivity concentrations. Concentration of radiochemical constituents provided in the reference Safety Analysis Report (SAR) by Nuclear Steam Supply System (NSSS) supplier.

detergent wastes. Liquid radioactive waste containing detergents, soaps, or similar organic materials.

dry cleaning waste. Liquid solvent wastes generated in the operation of dry cleaning laundry equipment.

expected basis radioactivity concentrations. Radiochemical constituents as provided in American National Standard Radioactive Source Term for Normal Operation of Light Water Reactors, ANSI/ANS-18.1-1984 [3].

high purity (clean) wastes. Liquid radioactive wastes of low conductivity (normally less than 50 microsiemens) and low insoluble solids content

[1] Numbers in brackets [ ] refer to corresponding numbers in Section 7, References.