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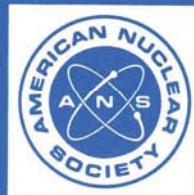
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**liquid radioactive waste processing
system for light water reactor plants**

an American National Standard

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

Secretariat
American Nuclear Society

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Working Group ANS-55.6**

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American National Standard

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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:

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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 dry-well 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 Non-nuclear 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.

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

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