



American National Standard

ANSI/HPS N13.45-2012

Incineration of Low-Level Radioactive Waste

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American National Standards Institute, Inc.



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Foreword

(This foreword is not part of American National Standard ANSI/HPS N13.45-2012.)

This American National Standard is intended to provide minimum requirements for incineration of low-level radioactive waste that is generated at facilities such as medical centers, universities, and research institutions. It describes the identification and classification of wastes, selection and siting of incineration equipment, licensing and permitting requirements, control and monitoring, disposal of residues, documentation, and decontamination and decommissioning.

This standard incorporates contemporary information and is intended to be consistent with current U.S. regulatory requirements or guidance. The process of licensing and permitting an incinerator will require a thorough knowledge of state and local regulations that may be more stringent than this standard. Institutions may wish to refer to this standard when discussing licensing or permitting requirements with regulators.

Suggestions for improvement of this standard are welcome. Suggestions should be sent to the Health Physics Society, 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101.

Incineration of Low-Level Radioactive Waste

1.0 Scope

This standard provides guidelines for incineration of combustible forms of low-level radioactive waste. It addresses the siting, licensing and permitting, operation and monitoring of the incinerator operation, disposal of residues, and decontamination and decommissioning. This standard may be applied to incineration of mixed wastes (i.e., radioactive wastes that contain other hazardous components as defined by federal or state agencies), provided consideration is given to additional design features and regulatory permitting required by the hazardous nature of the wastes.

For purposes of this standard, incineration is considered a treatment or volume-reduction technique rather than a disposal mechanism. Other volume-reduction techniques have previously been described, such as in "Solid Radioactive Waste Processing Systems for Light Water Reactor Plants," ANSI/ANS 55.1-2009 (1992).

2.0 Definitions

2.1 Limitations

This standard does not address non-radiological hazards associated with incineration. Additionally, the decision of whether specific waste items (e.g., plastics containing PVC) are acceptable for incineration is beyond the scope of this standard.

The definitions that follow are of a restricted nature for purposes of this document.

2.2 Glossary of terms

Aerodynamic Downwash: The downward movement of a plume associated with the

turbulence created when air passes over a structure.

Agreement State: Any state with which the U.S. Nuclear Regulatory Commission has entered into an agreement to allow that state to assume regulatory authority over certain radioactive materials.

As Low As Reasonably Achievable (ALARA): A policy of making every reasonable effort to keep exposure to ionizing radiation as far below established limits as is practical, where economic, technological, and social factors are taken into account.

Ash: Solid residue that results from the incineration process, which includes bottom ash from the primary chamber and any fly ash collected from the emissions stack, scrubber, or filter train.

Batch Burn: The process of charging an incinerator, completing the incineration cycle for that charge, allowing the combustion chamber to cool down, and removing the ash residue prior to introduction of another charge.

Biological/Pathological/Infectious Low-Level Radioactive Waste: A waste stream consisting of research animal carcasses, tissues/body fluids, syringes and other materials that have come into contact with tissues/body fluids, and discarded viral/microbiological material that is contaminated with radioactivity.

British Thermal Unit (BTU): The quantity of thermal energy required to raise the temperature of one pound of water 1°F at, or near, its point of maximum density (39.1°F).

Burn Parameters: A set of physical properties, (e.g., temperature in primary chamber and charge rate) whose values determine the