

# American Nuclear Society

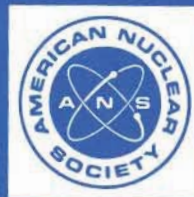
containment system leakage  
testing requirements

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**ANSI/ANS-56.8-1994**

**American National Standard  
for Containment System Leakage  
Testing Requirements**

Secretariat  
**American Nuclear Society**

Prepared by the  
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## Foreword

(This foreword is not part of American National Standard for Containment System Leakage Testing Requirements, ANSI/ANS-56.8-1994.)

This standard provides a basis for determining leakage rates through the primary reactor containment systems of light-water-cooled nuclear power plants.

The leakage rate tests performed on the primary reactor containment system simulate some of the conditions (e.g., penetrations vented, flooded, or in operation) that exist during a design basis accident. The test methodology and the associated requirements for both whole containment (integrated) and individual pathway (local) leakage rate testing are contained in this document.

The appendices contain Type A and verification test methods, formula derivations, data rejection criteria, containment atmosphere stabilization criteria, and test termination criteria.

The regulatory requirements for containment leakage rate testing are contained in Title 10, "Energy," Code of Federal Regulations (CFR), Part 50, "Domestic Licensing of Production and Utilization Facilities," Appendix J, "Leakage Rate Testing of Containments of Light-Water-Cooled Nuclear Power Plants." This standard is not in complete agreement with the current version of Appendix J.

The previous revision to this standard was issued in 1987. This revision was written to take advantage of subsequent advancements in computer and instrument technology. Also incorporated are items which the committee believed to be improvements in testing methodology and requirements. These include: an as-found and as-left section, minimum and maximum pathway leakage rates, test termination limits, containment air mass stabilization criteria, and improved data rejection guidelines.

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# Containment System Leakage Testing Requirements

## 1. Introduction

**1.1 Purpose.** This standard provides a basis for determining leakage rates through the primary containment of light-water reactor nuclear power plants.

The examples given in various sections of this standard do not contain or modify any requirements. These examples are for illustration only and clarify the intent of the text. Furthermore, the examples are not meant to be all-inclusive. Examples of alternative methods or exceptions to general requirements do not constitute permission to categorically apply the exceptions. Each alternative or exception needs to be evaluated to determine its validity and effect.

**1.2 Scope.**<sup>1</sup> This standard specifies acceptable primary containment leakage rate test requirements to assure valid testing. The scope includes

- (1) Leakage test requirements
- (2) Test instrumentation
- (3) Test procedures
- (4) Test methods
- (5) Acceptance criteria
- (6) Data analysis
- (7) Inspection and reporting of test results.

## 2. Definitions<sup>2</sup>

The following terms are for general use in this standard:

**acceptance criteria.** The standards against which test results are to be compared for establishing the functional acceptability of the primary containment as a leakage limiting boundary.

**accuracy.** Conformity of an indicated value to an accepted standard value or true value.

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<sup>1</sup> At the time this standard was approved, it contained certain requirements (i.e., testing frequency requirements) that were not fully consistent with existing regulations in the United States. The user of the standard should ensure that its application in a regulated facility is appropriate.

<sup>2</sup> Specialized definitions used in the appendices are defined in the appendix where they are used.

**active failure.** A malfunction, excluding passive failures, of a component which relies on mechanical movement or change of state to complete its intended function upon demand. Examples of active failures include the failure of a valve or a check valve to move to its correct position, or the failure of a pump, fan, or diesel generator to start. Spurious action of a power-operated component originating within its actuation or control system shall be regarded as an active failure unless specific design features or operating restrictions preclude such spurious action. An example is the unintended energization of a power-operated valve to open or close.

**as-found leakage rate.** The leakage rate prior to any repairs or adjustments to the barrier being tested.

**as-found testing.** Leakage rate testing after some period of normal service conditions, performed prior to any repairs or adjustments.

**as-left leakage rate.** The leakage rate following any repairs or adjustments to the barrier being tested.

**as-left testing.** Leakage rate testing performed following repair or adjustment.

**confidence level.** The probability that the true leakage rate does not exceed the upper confidence limit.

**containment atmosphere volume weighted average temperature (T).** The temperature derived from weighting each temperature sensor reading by the volume it represents.

**containment integrated leakage rate test (CILRT).** The leakage rate test performed on the primary containment by simulating some of the conditions (e.g., penetrations vented, drained, flooded, or in operation) that exist during a design basis accident. The CILRT consists of the following phases or activities:

- (1) inspecting the primary containment
- (2) pressurizing the primary containment system
- (3) stabilizing the containment atmosphere