# American Nuclear Society

**REAFFIRMED**
**February 23, 2017**
**ANSI/ANS-57.8-1995 (R2017)**
**August 26, 2011**
**ANSI/ANS-57.8-1995 (R2011)**

## fuel assembly identification

## an American National Standard

**REAFFIRMED**
**January 12, 2005**
**ANSI/ANS-57.8-1995**
**(R2005)**

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reviewed and reaffirmed with the recognition that it may reference other standards and documents that may have been superseded or withdrawn.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 decision-making or a graded approach to quality assurance. Users should consider the use of these industry initiatives in the application of this standard

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ANSI/ANS-57.8-1995

# American National Standard
# Fuel Assembly Identification

Secretariat
**American Nuclear Society**

Prepared by the
**American Nuclear Society**
**Standards Committee**
**Working Group ANS-57.8**

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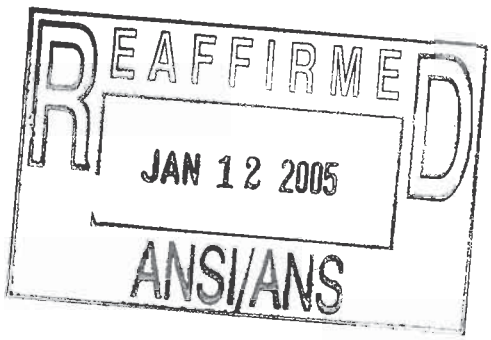

**American National Standard**

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 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.

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# Foreword

(This Foreword is not a part of American National Standard Fuel Assembly Identification, ANSI/ANS-57.8-1995.)

This standard describes a system for the unique identification of nuclear fuel assemblies. This uniqueness is achieved by the assignment of the following to each fuel assembly: 1) a fabricator or facility identification prefix, and 2) a serial number. Although the standard was developed primarily for commercial light-water reactor fuel, it may be used for any reactor fuel contained in discrete fuel assemblies that can be identified with a serial number as specified by the standard.

The standard was originally developed to meet a need of the U.S. Atomic Energy Commission, now the U.S. Nuclear Regulatory Commission, for its Safeguards Program. Reporting and recordkeeping are necessary parts of this program. Because of the large volume of fuel needed to support commercial power reactors, a systematic method of fuel assembly identification is necessary to ensure that no two fuel assemblies manufactured in the United States have the same number; the reactor fuel can thus be accurately and expeditiously recorded. This standard provides such an identification system.

This revised standard was developed by Working Group ANS-57.8. Members at the time of its preparation were:

R. H. Ripley, Chairman, *Union Electric Company*
L. G. Ernst, *Duke Power Company*
M. T. McKelvy, *Southern Nuclear Operating Company*
W. J. Rawlings, *Westinghouse Electric Corporation*

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

W. H. D'Ardenne, Chairman
M. D. Weber, Secretary

R. E. Allen ..... UE&C Nuclear
(for the Institute of Electrical and Electronics Engineers, Inc.)
P. Ballinger ..... Nebraska Public Power District
S. Bhattacharya ..... Pacific Gas & Electric Company
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W. B. Reuland ..... Electric Power Research Institute
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D. J. Spellman ..... Oak Ridge National Laboratories
S. L. Stamm ..... Stone & Webster Engineering Corporation
J. D. Stevenson ..... Stevenson & Associates
C. D. Thomas, Jr. ..... Yankee Atomic Electric Company
G. P. Wagner ..... Commonwealth Edison Company
N. Weber ..... Sargent & Lundy
R. Weir ..... Tennessee Valley Authority

# Contents

# Fuel Assembly Identification

## 1. Scope and Purpose

This standard describes requirements for the unique identification of fuel assemblies utilized in nuclear power plants. It defines the characters and proposed sequence to be used in assigning identification to fuel assemblies.

This standard was developed primarily for commercial light-water reactor fuel, but may be used for any reactor fuel contained in discrete fuel assemblies that can be identified with a serial number as specified by this standard.

Additionally, this standard describes requirements for a matrix system for identification in mapping the location of fuel rods within a fuel assembly. The matrix system establishes unique *x-y* coordinates for each possible rod location.

## 2. Definitions

**fuel rod (fuel pin).** The smallest component of a reactor fuel assembly that encapsulates the nuclear fuel.

**fuel assembly.** A matrix array of fuel rods which is normally treated as a unit for handling and accountability purposes.

**lifetime (of a fuel assembly).** The period starting at the time of shipment from the fabricator's facility and ending when the assembly is destroyed or dismantled, and is no longer identifiable as an assembly.

**shall, should, and may.** The word "shall" denotes a requirement; the word "should" denotes a recommendation; the word "may" denotes permission, neither a requirement nor a recommendation.

## 3. Fuel Assembly Identification Numbering System

**3.1 Composition.** Fuel assembly identification shall be provided through a six-character numbering system consisting of a prefix of two alphabetic characters, which identify the individual fabrication facility, followed by a serial number consisting of four alphanumeric characters. Definition and specification of the characters are given in 3.1.1 through 3.1.4 below.

**3.1.1 Fabrication Facility Identification.** The alphabetic characters for identification of the fabrication facility shall consist of the first two characters of the three-character code assigned to each fabrication facility by the United States Nuclear Regulatory Commission (NRC).[1]

**3.1.2 Serial Number.** The combinations of four characters used for serial numbers shall be assigned without repetition to individual fuel assemblies by the fuel fabricator. The serial number shall be comprised of the characters specified in 3.1.3 and should be assigned in the sequence specified in 3.1.4.

**3.1.3 Serial Number Characters.** The characters used for fuel assembly serial numbers shall be selected from the Arabic numerals 0 through 9 and letters of the English alphabet, except B, F, I, O, Q, and Z; this provides 30 different characters.

**3.1.4 Serial Number Sequence.** The character combinations in the serial numbers should be assigned to fuel assemblies by the fuel fabricator using a base-30 numerical system. The numerical order of the 30 characters used in the base is the numerals from 0 through 9, followed by the letters defined in 3.1.3 as normally ordered from A through Y.

The number sequence in the base-30 numerical system is illustrated in tabular form in the Appendix for clarification and guidance. Progressing from 0000 through YYYY provides 810,000 combinations of characters for each fabrication facility.

**3.2 Style of Characters.** The style of characters used for the identification system shall

[1] The code list appears in "Directory of Reporting Identification Symbols," available from the Office of Nuclear Materials Safety and Safeguards, USNRC, Washington, DC 20555.