

American Nuclear Society

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fuel assembly identification

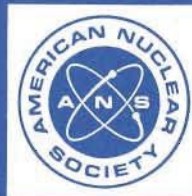
an American National Standard

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**American National Standard
Fuel Assembly Identification**

**Secretariat
American Nuclear Society**

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

**Published by the
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American National Standard

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Foreword

(This Foreword is not a part of American National Standard Fuel Assembly Identification, ANSI/ANS-57.8-1978, Revision of N18.3-1972.)

This Standard describes a system for the unique identification of nuclear fuel assemblies. This uniqueness is provided by assigning each fuel assembly a fabricator or facility identification prefix and 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 U.S. Nuclear Regulatory Commission, for its Safeguards Program. Reporting and record keeping are a necessary part 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.

The Standard was originally developed by the Fuel Assembly Identification Working Group of Subcommittee 13. Members of the Working Group were:

C. Sastre, Chairman, <i>Brookhaven National Laboratory</i>	R. R. Dlesk, <i>Commonwealth Edison Company</i>
G. C. Andognini, <i>Yankee Atomic Electric Company</i>	L. F. Hardy, <i>General Electric Company</i>
A. J. Anthony, <i>Combustion Engineering</i>	D. Mars, <i>Babcock & Wilcox Company</i>
E. A. Bassler, <i>Westinghouse Electric Corporation</i>	J. D. O'Toole, <i>United Nuclear Corporation</i>
	P. D. Wright, <i>Gulf General Atomic</i>

A substantial contribution was made by A.A. Karkosza, past Chairman of the Working Group.

This Standard was originally prepared by Subcommittee 13 of the Standards Committee of the American Nuclear Society. At the time of approval, the membership of the Subcommittee was:

J. F. Mumm, Chairman, <i>Babcock & Wilcox Company</i>	J. D. O'Toole, <i>United Nuclear Corporation</i>
G. C. Andognini, <i>Yankee Atomic Electric Company</i>	M. F. Sankovich, <i>Babcock & Wilcox Company</i>
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F. Chin, <i>Nuclear Energy Liability Insurance Association</i>	C. E. Weber, <i>U.S. Atomic Energy Commission</i>
R. L. Heiks, <i>Consumers Power Company</i>	J. M. Williams, <i>U.S. Atomic Energy Commission</i>
D. K. Magnus, <i>U.S. Atomic Energy Commission</i>	W. Willoughby II, <i>South Carolina Electric & Gas Company</i>
	T. Wyke, <i>Duke Power Company</i>

The Standard was reviewed by Subcommittee ANS-50, the Power Reactor Systems Committee, in January 1978 to prepare the maintenance revision. It was designated ANS-57.8 at the time since ANS-13 had been incorporated into ANS-50 previously. The membership of ANS-50 at the time of its approval of the revision was:

J. F. Mallay, Chairman, <i>Babcock & Wilcox Company</i>	C. C. Lawrence, <i>Baltimore Gas and Electric Company</i>
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J. R. Floyd, <i>Metropolitan Edison Company</i>	M. D. Weber, <i>American Nuclear Society</i>
C. J. Gill, <i>Bechtel Power Corporation</i>	G. L. Wessman, <i>General Atomic Company</i>
A. R. Kasper, <i>Combustion Engineering, Inc.</i>	J. E. Windhorst, <i>Southern Company Services</i>
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M. Kehnemuyi, <i>U.S. Nuclear Regulatory Commission</i>	

The American National Standards Committee N18, Nuclear Design Criteria, had the following membership at the time of its approval of the revision:

G. L. Wessman, *Chairman*
M. D. Weber, *Secretary*

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American National Standard

Fuel Assembly Identification

1. Scope and Purpose

1.1 This Standard describes requirements for the unique identification of fuel assemblies utilized in nuclear power plants. It 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.

1.2 This Standard defines the characters and proposed sequence to be used in assigning identification to the fuel assemblies. The identification shall be borne by the fuel assembly during its lifetime.

2. Definitions

2.1 Fuel Rod (Fuel Pin). The smallest component of a reactor fuel assembly which contains the encapsulated nuclear fuel.

2.2 Fuel Assembly. A grouping of fuel rods which is normally treated as a unit for handling and accountability purposes.

2.3 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 as an entity.

2.4 Shall. The word "shall" is used to express what is mandatory.

2.5 Should. The word "should" is used to express what is recommended.

3. Identification Numbering System

3.1 Composition. Fuel assembly identification is 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 paragraphs 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 last two characters of the three-character code assigned to each fabrication facility by the United States Atomic Energy Commission (AEC) under AEC Reporting Identification System (RIS). The code list appears in "Directory of Reporting Identification Symbols," available from the Office of Safeguards and Materials Management, USAEC, Washington, DC.

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 I and O; this provides 34 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-34 numerical system. The numerical order of the 34 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 Z.

The number sequence in the base-34 numerical system is illustrated in tabular form in the Appendix for clarification and guidance. Progressing from 0000 through ZZZZ provides 1,336,336 combinations of characters for each fabrication facility.

3.2 Style of Characters. The style of characters used for the identification system shall be single-stroke gothic, vertical or microfont, capital letters, and numerals.

An example of such style is shown in American National Standard Drafting Practices, Y14.2-1973; Section 2, Line Conventions and Lettering, Figures 14 and 15. The size and spacing of characters shall be as set forth in 3.4 below.