

American National Standard

a guide for acquisition and documentation
of reference power reactor physics measurements
for nuclear analysis verification

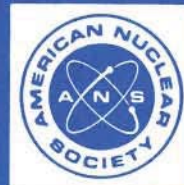
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of Reference Power Reactor Physics Measurements
for Nuclear Analysis Verification

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Foreword

(This Foreword is not part of American National Standard A Guide for Acquisition and Documentation of Reference Power Reactor Physics Measurements for Nuclear Analysis Verification N652-1976/ANS-19.4)

It is the purpose of this Standard to specify criteria for performing and documenting measurements on light water power reactors which are to be used as reference measurements in the validation of reactor physics computational methods. Considerably more confidence is placed in nuclear analysis methods when they have been successfully used to calculate performance characteristics that have been carefully measured in an actual operating system. The existence of well-documented measurements made in a number of operating power reactors will fill a need on the part of the nuclear designer and reactor operator, and will permit the development of increased confidence in the design and performance analysis methods used to predict reactor performance. This Standard is not a guide for routine measurement of reactor physics parameters in an operating reactor. The objective of routine measurements carried out on an operating reactor is to satisfy specific operational, licensing, and contractual requirements. In many cases, however, measurements made on a routine basis are of sufficient quality to merit their use as reference measurements, and reporting these measurements in accordance with this guide is encouraged.

In addition, if time, personnel and instrumentation are available during the course of operation to perform additional measurements not normally required, reactor designers and operators are encouraged to specify, perform, document and report such measurements for use as reference power reactor physics measurements.

This Standard was developed primarily for application to measurements on reactors whose pertinent descriptions are available, or can be made available, to the technical community. This does not preclude its use on reactors for which some reactor information required to stimulate the measurement is proprietary. Since performance of reference measurements is not required on any system, application of this Standard is not related to the question of what reactor design information should, or should not, be publicly disseminated.

This Standard is an initial attempt to produce criteria for reference reactor physics measurements. As such it specifically considers only those types of reactor physics measurements that experience has shown to be practical and reproducible when carried out in large power reactors. The intended current application of the standard is confined to light water moderated and cooled power reactors. Inclusion of similar guidelines for measurements in High Temperature Gas Reactors (HTGRs) and Liquid Metal Fast Breeder Reactors (LMFBR's) is intended at a future date. In view of the lack of experience in applying such a standard to power reactor physics measurements, review and revision within a two-year period is recommended.

This Standard is intended primarily for measurements which can be performed at the reactor site; destructive analysis of the spent or partially spent fuel to determine isotopic composition, for example, is not covered. In the event such destructive analysis is carried out, however, its usefulness is increased if it is preceded by a series of reference quality measurements carried out in accordance with this Standard.

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