

# American Nuclear Society

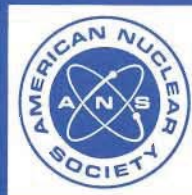
**WITHDRAWN**

April, 1990  
ANSI/ANS-2.10-1979

**guidelines for retrieval, review,  
processing and evaluation of records  
obtained from seismic instrumentation**

an American National Standard

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**American National Standard  
Guidelines for Retrieval, Review,  
Processing and Evaluation of Records Obtained  
from Seismic Instrumentation**

**Secretariat  
American Nuclear Society**

**Prepared by the  
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# Foreword

(This Foreword is not a part of American National Standard Guidelines for Retrieval, Review, Processing and Evaluation of Records Obtained from Seismic Instrumentation, ANSI/ANS-2.10-1979.)

The purpose of this standard is to specify for light water-cooled, land-based nuclear power plant guidelines for timely retrieval and evaluation of records obtained from seismic instrumentation specified in American National Standard Earthquake Instrumentation Criteria for Nuclear Power Plants, ANSI/ANS-2.2-1978.

This standard sets forth guidelines on how the records obtained from such instrumentation should be treated.

The December, 1973 version of Title 10, Code of Federal Regulations, Part 100, "Seismic and Geologic Criteria for Nuclear Power Plants," requires that a nuclear power plant be shut down in the event that the Operating Basis Earthquake (OBE) is exceeded. This standard provides guidelines for a timely evaluation of data used to determine whether or not the OBE has been exceeded. Guidance to the utility or its agents is provided in connection with the following activities:

(1) Retrieval of recorded data from seismic instrumentation in the event an earthquake occurs sufficient to activate the seismic instrumentation.

(2) Correction or modification of the recorded data to minimize spurious or erroneous signals.

(3) Preliminary evaluation of the corrected recorded data to estimate the degree of earthquake excitation in terms of the levels of earthquake excitation used as the plant design bases.

(4) Analysis applied to the corrected recorded data to obtain calculated results which can be used to compare with plant components seismic design bases.

(5) Final comparison of recorded seismic data, including the calculated results, and evaluations of the comparisons.

(6) Storage and maintenance of recorded data and subsequent calculations.

This standard does not deal with operator procedures to accomplish plant shutdown due to seismic activity, restarting of plants after shutdown due to seismic activity, or any power plant operator functions.

When an earthquake occurs, seismic data are recorded by the seismic instrumentation and are either immediately available through remote recording or annunciation or can be obtained by extracting recorded data manually from the activated seismic instrumentation. The remotely obtained data are used to make an early determination of the degree of severity of the seismic event in terms of the seismic design bases. This data will be used to make the initial determination of whether the plant should be shut down, if it has not already been shut down by normal mechanisms due to component malfunction, or has been required to be shut down due to operation perturbations observed by the control room operator. If, on the basis of this initial evaluation, it is concluded that the seismic design has not been exceeded, it is presumed that the plant will not be shut down. However, additional studies may be undertaken to evaluate possible long-term effects and to document the recorded response and the calculated results. These studies may be minimal depending on the initial evaluation.

In the event that the initial evaluations result in the conclusion that the plant should be shut down, this standard sets forth guidelines for analysis techniques and comparison methods which can be used to arrive at a conclusion as to whether the plant can be safely re-started on the basis of seismic considerations. The sequence of owner activities is set forth in Figure 1 which is intended to serve as the "road map" for the standard. Specific existing regulations or codes are not necessarily included in the scope of this standard and are set forth in other documents.

This standard was prepared by Working Group ANS-2.10 of ANS-2 subcommittee, Site Evaluation, of the American Nuclear Society Standards Committee.

The first draft was submitted to the Subcommittee for their review and for industry

comment on May 15, 1975. The working group reviewed the comments received from the Subcommittee and industry and the draft dated September 1, 1976 was sent to the Subcommittee for balloting. The Subcommittee approved the draft with some comments. These comments were reviewed and incorporated in a draft dated January 24, 1977. Comments received from N18 have been reviewed and implemented leading to the current draft dated February 28, 1978.

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# Guidelines for Retrieval, Review, Processing and Evaluation of Records Obtained From Seismic Instrumentation

## 1. Scope

This standard is intended for use at light water-cooled, land-based nuclear power plants and may be used for guidance, where appropriate, at other types of nuclear power plants.

Included is an Earthquake Decision Tree and specific associated procedures for evaluating records obtained from seismic instrumentation specified in American National Standard "Earthquake Instrumentation Criteria for Nuclear Power Plants, ANSI/ANS-2.2-1978. [1]<sup>1</sup>

This standard does not include specific operator functions to be accomplished in the event of an earthquake. The standard does, however, define the type and timing of plant owner activities to be accomplished in the event of an earthquake. These activities relate to shutdown requirements of Title 10, Code of Federal Regulations, Part 100, Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," [2], and evaluation of seismic data obtained from seismic instrumentation. The activities described should be accomplished in a timely fashion to satisfy the regulatory requirements of promptness in reporting information and determining the seismic response of the plant.

Instructions are provided in this standard for treatment of data from a variety of seismic instruments not all of which may be required. The procedures set forth herein may be used where applicable, or when considered desirable by the plant owner for instrumentation other than specified in ANSI/ANS-2.2-1978. [1]

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<sup>1</sup>Numbers in brackets refer to corresponding numbers in Section 8, "References."

## 2. Purpose

The purpose of this standard is to define activities that shall be accomplished, in the event of an earthquake, in connection with seismic instrumentation data retrieval, processing, interpretation, evaluation and storage.

## 3. Definitions

For the purpose of this standard, the following words and phrases are defined:

**active status.** Status of being in the position to record new data without destroying old data previously recorded by the instrument.

**accelerogram.** The record of absolute acceleration varying with time for a single linear component of vibration, recorded by a time-history accelerograph.

**accessible.** Instruments or sensors whose locations permit ready access during plant operation without violation of applicable safety regulations such as Occupational Safety and Health Administration (OSHA), plant security or radiation protection.

**data processing.** The preparation and compilation of recorded data for subsequent evaluation.

**design bases response spectra (DBRS).** Response spectra which were used to design Seismic Category I structures, systems and components.

**design bases time-history.** The acceleration time-history which corresponds to the DBRS.

**non-accessible.** Instruments or sensors whose locations do not permit ready access during