U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REGULATORY RESEARCH

July 1981
Division 1
Task MS 140-5

DRAFT REGULATORY GUIDE AND VALUE/IMPACT STATEMENT

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PROPOSED REVISION 2 TO REGULATORY GUIDE 1.12
NUCLEAR POWER PLANT INSTRUMENTATION FOR EARTHQUAKES

A. INTRODUCTION

Paragraph (c) of § 50.36, "Technical Specifications," of 10 CFR Part 50, "Licensing of Production and Utilization Facilities," requires the technical specifications of a facility to include surveillance requirements to ensure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions of operation will be met. Appendix A, "Seismic and Geologic Siting Criteria for Nuclear Power Plants," to 10 CFR Part 100, "Reactor Site Criteria," requires, in Paragraph VI(a)(3), that suitable instrumentation be provided to determine promptly the seismic response of plant features important to safety to permit comparison of such response with that used as the design basis. Such a comparison is needed to decide whether the plant can continue to be operated safely. This guide describes seismic instrumentation acceptable to the NRC staff as satisfying the above-stated requirements of Appendix A to 10 CFR Part 100. This guide does not, however, address the need for instrumentation that would automatically trip a nuclear power plant or specify the methods to be used in the analysis of recorded data.

B. DISCUSSION

Working Group ANS-2.2 of Subcommittee ANS-2, Site Evaluation, of the American Nuclear Society Standards Committee has developed a standard that contains criteria for earthquake instrumentation, including the location and number of instruments, instrument characteristics, instrumentation station

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This regulatory guide and the associated value/impact statement are being issued in draft form to involve the public in the early stages of the development of a regulatory position in this area. They have not received complete staff review and do not represent an official NRC staff position.

Public comments are being solicited on both drafts, the guide (including any implementation schedule) and the value/impact statement. Comments on the value/impact statement should be accompanied by supporting data. Comments on both drafts should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Docketing and Service Branch, by SEP 30 1981

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installations, alternative instruments, and maintenance. This standard was prepared as a revision to ANSI N18.5-1974 and was approved and designated ANSI/ANS 2.2-1978, "Earthquake Instrumentation Criteria for Nuclear Power Plants,"* by the American National Standards Institute on September 5, 1978.

Section 6.4.2 of ANSI/ANS 2.2-1978, in items (2) and (4), refers to proposed Appendix A to 10 CFR Part 100. Appendix A to Part 100 was published as a final rule on November 13, 1973 (38 FR 31279). The correct paragraph number for the reference is V(a)(2) in items (2) and (4). Section 6.4.2 also refers to this guide for a discussion of the acceleration value corresponding to zero period in the design response spectra. For this reason, the following paragraph from Revision 1 is reprinted herein:

> The acceleration value corresponding to zero period in the containment foundation design response spectra may be referred to as the "acceleration level" of the input design earthquake motion to the containment structure. This acceleration level is an important parameter because the magnitudes of the design response spectra themselves are affected to a large extent by this level, and the plant shutdown requirement as specified in Appendix A to 10 CFR Part 100 is also related to this level.

The dynamic range specified in Section 5.3 of ANSI/ANS 2.2-1978 for the recorder is not consistent with the dynamic range specified in Section 5.2 for the acceleration sensors that provide data to the recorder. The regulatory position provides for compatibility between the recorder and the sensors.

The maintenance requirements in ANSI/ANS 2.2-1978 do not call for frequent visual inspections of passive instruments. Frequent visual inspections are necessary to detect signs of obvious physical damage to these instruments. Furthermore, active instruments have been known to be out of service during plant shutdowns, and the Standard does not address this matter. The Standard has been supplemented to correct these deficiencies.

C. REGULATORY POSITION

Earthquake instrumentation specified in ANSI/ANS 2.2-1978, "Earthquake Instrumentation Criteria for Nuclear Power Plants," is acceptable to the NRC

*Copies may be obtained from the American Nuclear Society, 555 North Kensington Avenue, La Grange Park, Illinois 60525.

staff for satisfying the seismic instrumentation requirements indicated in Paragraph VI(a)(3) of Appendix A to 10 CFR Part 100 for ensuring the safety of nuclear power plants, subject to the following:

1. Instead of the dynamic range specified in Section 5.3.5 of the Standard, a range of 100:1 should be used.

2. In addition to the maintenance requirements in Section 8 of the Standard, a visual inspection of accessible passive sensors should be made at one-month intervals to detect signs of obvious physical damage. For normally inaccessible passive sensors this visual inspection should be made at the end of the periods during which they are accessible, but not more often than at one-month intervals. Furthermore, active sensors should be maintained in operational condition during periods of plant shutdown.

D. IMPLEMENTATION

The purpose of this section is to provide information to applicants regarding the NRC staff's plans for using this regulatory guide.

Revision 1 and this Proposed Revision 2 to Regulatory Guide 1.12 reflect NRC staff practice in use since September 1973. Therefore, except in those cases in which the applicant proposes an acceptable alternative method for complying with specified portions of the Commission's regulations, the method described herein is being and will continue to be used in the evaluation of submittals in connection with applications for construction permits and operating licenses.

In addition, the staff intends to apply the regulatory position of this guide to all operating reactors, construction permit applications, and operating license applications that do not already have the recommended instrumentation. The staff expects to accomplish this in the two refueling cycles of operating plants following publication of the active guide but no later than December 1, 1985.

VALUE/IMPACT STATEMENT

1. The Proposed Action

1.1 Seismic instrumentation is required at nuclear power plants so that, in the event of an earthquake, the seismic response of plant features important to safety can be determined promptly. This response is then compared with that used as the design basis in order to decide whether the plant can continue to be operated safely. Detailed guidance on the type and location of such instrumentation is currently provided in Revision 1 of Regulatory Guide 1.12, "Instrumentation for Earthquakes," issued in April 1974, which endorses ANSI N18.5-1974. The proposed action will update this guidance by endorsing the revised version of this standard, which is designated ANSI/ANS 2.2-1978.

1.2 The proposed regulatory position reflects the current NRC staff practice in use since September 1973. However, the staff intends to apply the regulatory position of this guide to all operating reactors, construction permit applications, and operating license applications that do not already meet the recommendations of the guide.

2. Need for the Proposed Action

2.1 Regulatory Guide 1.12 currently endorses ANSI N18.5-1974, "Earthquake Instrumentation Criteria for Nuclear Power Plants," with several exceptions regarding the number and location of seismic recording instruments. Working Group ANS-2.2 of American Nuclear Society Subcommittee ANS-2, Site Evaluation, has revised N18.5. The revision reflects most of the exceptions taken in Revision 1 of Regulatory Guide 1.12. The proposed action will endorse the revised standard, ANSI/ANS 2.2-1978, to eliminate most of the exceptions.

2.2 Backfitting of the guide is needed to ensure the safety against earthquake hazards of all those plants that do not already have the seismic instruments recommended in this guide. Instruments recommended in the proposed guide are the minimum needed to promptly determine the response of the plant for comparison with the design basis in order to decide whether the plant can continue to be operated safely.

3. Impact of the Proposed Action

3.1 The proposed revision of Regulatory Guide 1.12 endorses the current staff position. However, the staff will have to review proposed modifications to the plants that do not already have the instrumentation recommended in this guide.

3.2 There will be no impact on industry for the plants currently under review because the proposed revision to Regulatory Guide 1.12 will endorse the current staff position, which has been in use since September 1973.

3.3 Backfitting of this guide on those plants that virtually have no instruments will require the utility to spend an estimated $100,000 per plant for purchasing and installing the instruments (direct cost) plus another estimated $100,000 to cover the cost of engineering.

4. Decision of the Proposed Action

Regulatory Guide 1.12 should be updated to reflect the revision of ANSI N18.5 by endorsing revised standard ANSI/ANS 2.2-1978, and the staff should apply the recommendations of the updated guide to all plants that do not already have the recommended instrumentation.

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