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Subject: Docket ID NRC-2016-0201,  
Draft Regulatory Guide DG-1332,  
(Proposed Revision 3 of Regulatory Guide 1.12, dated March 1997),  
Nuclear Power Plant Instrumentation for Earthquakes

Attached are my comments on Draft Regulatory Guide DG-1332. Do not hesitate to contact me, if necessary.

Attachment: As Stated

Sincerely,

Roger M. Kenneally

SUNSI Review Complete

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Add= S. Tabatabai (SH 151)

E. O'Donnell (EXD)

**Docket ID NRC-2016-0201**

Draft Regulatory Guide DG-1332  
(*Proposed Revision 3 of Regulatory Guide 1.12, dated March 1997*)  
Nuclear Power Plant Instrumentation for Earthquakes

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**General**

In general, I agree with the instrumentation type, locations, characteristics, and maintenance presented in Proposed Revision 3 of Regulatory Guide (RG) 1.12 dated March 1997. However, I do have a few comments for NRC staff consideration.

**Section A, Introduction**

1. Applicable Regulations

Comment:

Add the following regulation:

“10 CFR Part 20, "Standards for Protection Against Radiation," licensees are required to make every reasonable effort to maintain radiation exposures as low as is reasonably achievable.”

Supporting Information:

Part 20 needs to be cited, it is the basis for Regulatory Positions 1.3.3 and 1.3.4 in both RG 1.12, Revision 2, and this draft guide (DG-1332). Also, the second paragraph in Section C (Staff Regulatory Guidance) cites Part 20.

2. Related Guidance,

Comment

Corrections are need to the last item in the list of related guidance, ANSI/ANS-2.2. The standard was approved July 14, 2016, and the title should be “Earthquake Instrumentation Criteria for Nuclear Power Plants”

## Section C, Staff Regulatory Guidance

### 1. Regulatory Position 1.2, "Instrument Type and Location,"

#### Comment

Item (7), add the word "not" after foundation (see highlighted text below).

(7) Any Seismic Category I structure foundation **not** included in a certified standard design or facility.

#### Supporting Information:

Without the "not" this position is the same as Regulatory Position 1.2 (4).

### 2. Regulatory Position 1.3.2, "In-Structure Instrumentation,"

#### Comment

Add two statements (see highlighted text below).

The in-structure instrumentation should be placed at optimum locations that have been included in the building dynamic analysis so that the measured motion can be directly compared with the design in-structure response spectra and other parameters, or other considerations such as risk-informed locations. The instrumentation should not be located on a secondary structural frame member that is not modeled as a mass point in the building dynamic model. Locations should be selected to record highly amplified response rather than slightly amplified response. Thus, it would be inappropriate to locate instruments where amplification would not be expected.

#### Supporting Information:

The first addition is to include a statement about using risk-insights in the regulatory process consistent with *Federal Register* notices 76 FR 72220, "Incorporation of Risk Management Concepts in Regulatory Programs," (11/22/2011), and 78 FR 28258, "mPower™ Design-Specific Review Standard," (05/14/2013).

The second addition is to ensure that in-structure instrumentation is not placed in areas with low amplified response. A similar statement is specified in ANSI 18.5-1974, "Earthquake Instrumentation Criteria for Nuclear Power Plants," Section 4, "Location and Number of Instruments," third paragraph. This standard is endorsed (with exceptions) in Revision 1 of RG 1.12.

3. Regulatory Position 2, "Instrumentation at Multi-Unit Sites,"

Comment

Add two statements (see highlighted text below).

All units at the site should have the same instrumentation unless it can be demonstrated that the site conditions across the site are essentially the same and the structures expected structural responses of each unit are identical. In this case, a reduced set of instrumentation is permitted. Adequate free-field instruments should be provided to capture differences in site response, unless it can be demonstrated that one free-field instrument is adequate. In the case of separate control rooms for the same or different certified designs, annunciation should be provided to all control rooms as specified in Section C.7 of this guidance.

Supporting Information:

The first addition addresses the situation where the structures of each unit might be identical but oriented differently, resulting in different responses to vibratory ground motion.

The second addition clarifies that a free-field instrument may not be necessary for all units at the site.

**References**

Comment:

When NRC issued Revision 5 to RG 1.29 in July 2016, the title was changed to "Seismic Design Classification for Nuclear Power Plants," revise Ref. 10.