

## KHNPDCDRAIsPEm Resource

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**Subject:** APR1400 Design Certification Application RAI 29-7926 (03.02.01 - Seismic Classification)  
**Attachments:** APR1400 DC RAI 29 MEB 7926.pdf; image001.jpg

KHNP

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Please submit your RAI response to the NRC Document Control Desk.

Thank you,

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**Hearing Identifier:** KHNP\_APR1400\_DCD\_RAI\_Public  
**Email Number:** 34

**Mail Envelope Properties** (A67A2D233B3FBB4C8B5109AD7C39550715C4CCCCFF3)

**Subject:** APR1400 Design Certification Application RAI 29-7926 (03.02.01 - Seismic Classification)  
**Sent Date:** 6/15/2015 9:56:54 AM  
**Received Date:** 6/15/2015 9:56:55 AM  
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Files	Size	Date & Time
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APR1400 DC RAI 29 MEB 7926.pdf		108701
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# REQUEST FOR ADDITIONAL INFORMATION 29-7926

Issue Date: 06/15/2015

Application Title: APR1400 Design Certification Review – 52-046

Operating Company: Korea Hydro & Nuclear Power Co. Ltd.

Docket No. 52-046

Review Section: 03.02.01 - Seismic Classification

Application Section:

## QUESTIONS

### 03.02.01-1

SRP 3.2.1 Review Procedure 1 indicates that the staff review should establish whether the applicant's classification system conforms with Regulatory Guides 1.29, 1.143, 1.151, and 1.189. A statement regarding conformance with these RGs is necessary to make a safety finding under SRP 3.2.1. The applicant has referred to these RGs as guidance, but has not committed to conformance. Please revise the DCD to specify conformance with the RGs, or indicate where deviations from the guidance are taken and justify these deviations.

### 03.02.01-2

RG 1.29 defines seismic Category I in Regulatory Position C.1. In doing so, the RG creates two categories of SSCs: those that are seismic Category I and those that are not (non-seismic Category I).

The applicant has created three seismic categories: seismic Category I, which conforms with Regulatory Position C.1, and two other categories. The applicant has defined seismic Category II similarly to RG 1.29, Regulatory Position C.2. Seismic Category III is defined as "anything not seismic Category I or II" on DCD Tier 2, Section 3.2.1, page 3.2-5, but this is not consistent with the statement on page 3.2-3, defining it as "the equivalent of the non-seismic (NS) category specified in NRC RG 1.29"

RG 1.29 does not define a "non-seismic (NS) category." Please revise the definition of Seismic Category III on DCD Tier 2, page 3.2-3 to clarify what is meant by this statement in terms consistent with RG 1.29.

### 03.02.01-3

RG 1.29 Regulatory Position C.2 provides guidance regarding what the applicant has referred to as "seismic Category II." Please clarify the definition of seismic Category II on DCD Tier 2, Section 3.2.1, page 3.2-4 to address the following issues regarding consistency with this portion of RG 1.29:

1. The second paragraph of item (b), "Seismic Category II," refers to proximity to safety-related equipment and prevention of a "component or structure ... fulfilling its required function." This statement is inconsistent with Position C.2, which refers to the functioning of any seismic Category I feature, and should be clarified for consistency with the cited guidance.
2. This second paragraph also does not include the set of SSCs whose failure "could result in incapacitating injury to occupants of the control room," as stated in Position C.2, so this should be included for consistency with the cited guidance.
3. For clarity, terms such as "component or structure" and "equipment or structures" should be replaced by the more general "SSCs."
4. Finally, the statement in the third paragraph of item (b) that "NNS [non-nuclear safety] SSCs are designed to preclude a gross structural failure..." is consistent with Regulatory Position C.2 and addresses aspects of items (a) and (b) above, but NNS is later defined to be anything not ASME Class 1, 2, or 3. In addressing items (a) and (b) above, this paragraph should also be revised to clarify its intent—as currently written, the DCD commits to design all NNS SSCs using these criteria, which is not necessary for conformance with RG 1.29.

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### 03.02.01-4

In DCD Tier 2, Table 3.2-1, Remark (3)(d) is intended to designate seismic Category II SSCs. Table 3.2-1 contains several instances where this remark has been applied to SSCs that are not designated seismic Category II and other instances where this remark has not been applied to seismic Category II SSCs. Please clarify if the seismic classification or the remark is in error for each of the cases discussed above. A list of examples are provided below, but this list is not exhaustive:

1. Non-safety UPS in AB, CPB has a portion classified seismic Category II, but does not have this remark. Also see page 3.2-64 for additional examples.
2. Non-safety soft control (IFPD) (seismic Category III) and "Piping and valves on the SIS filling line from and including SI-700, 714, 701, 715 to the piping downstream of SI-476, 435, 478, 447" (seismic Category I).

### 03.02.01-5

Regulatory Guide 1.29 is indicated as guidance for meeting SRP 3.2.1. Regulatory Guide 1.29, Regulatory Position C.1 states that "cooling water and seal water systems or portions thereof that are required for functioning of reactor coolant system components important to safety, such as reactor coolant pumps [RCPs]" should be seismic Category I. DCD Tier 2, Table 3.2-1 lists the RCPs as seismic Category I, consistent with this position; however, in note N-3 to Table 3.2-1, the DCD indicates an exception to RG 1.29:

Loss of cooling water and/or seal water service to the reactor coolant pumps (RCPs) may require stopping the pumps. However, the continuous operation of the pumps is not required during or following an SSE. The auxiliaries are therefore not necessarily seismic Category I. The provision for cooling water to the pump bearing oil cooler and pump motor air cooler does not conform with the requirements of NRC RG 1.29.

In addition, note N-4 states: "Only those structural portions of the RCPs that are necessary to provide reasonable assurance of the integrity of the RCPB are Safety Class 1."

These notes should be revised to clarify which portions of the pump and its support systems (auxiliaries) are seismic Category I, Safety Class 1, Quality Group A, and subject to 10 CFR Part 50, Appendix B quality assurance requirements, as listed for the RCPs in Table 3.2-1. A complete justification from exceptions to RG 1.29 and 1.26 is also necessary, with reference to the key functions of the pump (e.g., seal cooling, coastdown flow, and reactor coolant pressure boundary (RCPB) integrity, as described in DCD Section 5.4.1). General statements such as "not necessarily" and "those structural portions ... that are necessary" are not sufficient to support the staff's finding in accordance with SRP Sections 3.2.1 and 3.2.2.

### 03.02.01-6

In DCD Tier 2, Table 3.2-1, the letdown heat exchanger supply and return piping between the valves CC-297, CC-301, CC-1685, and CC-1686 in division I, which appears to be part of the component cooling water system (CCW), is identified as seismic Category II, Quality Group D. This is supported in Figure 9.2.2-1 (Page 9.2-149). The letdown heat exchanger itself (part of the chemical and volume control system (CVCS)) is classified as seismic Category I, Quality Group C. This transition is not illustrated in the system figure. Please justify why a portion of CCW, a safety-related system, is not seismic Category I, and why its classification is not consistent with the heat exchanger that it supports. Updates to DCD Tier 2, Table 3.2-1 and associated system figures may be needed to clarify these classifications.

