REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.:	**433-8363**
SRP Section:	**SRP 19**
Application Section:	**19.1**
Date of RAI Issue:	**03/08/2016**

Question No. 19-80

10 CFR 52.47(a)(27) states that a design certification (DC) application must contain an FSAR that includes a description of the design-specific PRA and its results. SECY 93-087 approves an alternative approach to seismic PRA for the DC application and interim staff guidance (ISG) 20 provides guidance on the methods acceptable to the staff to demonstrate acceptably low seismic risk for a DC.

Design control document (DCD) Section 19.1.5.1.2.2 “Seismic Fragility Analysis” states that the fragility information shown in Table 19.1-43 is the reference plant’s fragility information. Provide the technical basis for concluding that the reference plant fragility information provided in Table 19.1-43 applies to the APR1400 DC and associated seismic spectra.

The applicant states that the exception to the use of fragility information from the reference plants is when a component has a high confidence in low probability of failure (HCLPF) value less than required. In this case, it is assumed that the APR1400 design will be modified to increase the capacity of these components. This increase in capacity should be documented as a commitment (combined operating license (COL) Information Item) by the applicant.

Response – (Rev. 1)

1) The paragraph of DCD Section 19.1.5.1.2.2, “The reference plant’s fragility information is shown in Table 19.1-43.” is deleted. DCD Section 19.1.5.1.2.2 is revised as shown in the Attachment.

2) The paragraph of DCD Section 19.1.5.1.1.2, “The exception to the use of fragility information from the reference plants is when a component has a HCLPF of less than 0.5g. In such cases, it is assumed that the APR1400 design will be modified to increase the capacity of components to at least a 0.5g HCLPF.” is deleted. DCD Section 19.1.5.1.1.2 is revised as shown in the response to RAI 433-8363 Question 19-75.

Impact on DCD

DCD Sections 19.1.5.1.2.2 and 19.1.5.1.1.2 are revised as shown in Attachment and in the response to RAI 433-8363 Question 19-75 Attachment 2, respectively.

Impact on PRA

There is no impact on the PRA.

Impact on Technical Specifications

There is no impact on the Technical Specifications.

Impact on Technical/Topical/Environmental Reports

There is no impact on any Technical, Topical, or Environmental Report.

19.1.5.1.2.2 Seismic Fragility Analysis

~~The reference plant's fragility information is shown in Table 19.1-43. Components shown in Table 19.1-43 with an HCLPF of screened out (S/O) are assumed to be seismically rugged. Component groups that were not screened out, and have a mean failure probability calculated, are:~~

~~a. Safety injection tanks~~

~~b. Emergency diesel generators~~

~~c. ESF-CCS cabinet and load center~~

~~d. Plant protection system cabinet~~

~~e. 4.16 kv main control switchgear (MCSG)~~

~~f. Offsite power~~

~~g. Containment building exterior walls~~

~~h. Containment building internal structure~~

~~i. Auxiliary building~~

~~j. Emergency diesel generator building~~

~~The HCLPF for the APR1400 design is 0.5g. The dominant contributors to the plant HCLPF are provided in Table 19.1-44. The seismically induced failure probabilities are the mean failure probabilities calculated at 1.0g.~~

~~A COL applicant is to confirm that the PRA-based seismic margin assessment is bounding for their specific site, and update the SMA to include site-specific SSC and soil effects (including sliding, overturning, liquefaction, and slope failure).~~

New text is added as shown A

19.1.5.1.2.3 Risk Insights

The following dominant sequences were identified for the seismic event.

A

The following building structures and the RCS components of the APR1400 standard design are evaluated by the CDFM method using the design-specific information within the scope of the DC application. The resulting HCLPF capacities and the associated failure modes of the SSCs are summarized in Table 19.1-43 and all the SSCs meet the target HCLPF capacity of 0.5g.

a. Safety-related building structures

1) Reactor containment building

2) Reactor containment internal

3) Auxiliary building

4) Emergency diesel generator building/Diesel fuel oil tank building

b. RCS components

1) Reactor pressure vessel (RPV)

2) Reactor vessel internals (RVI)

3) Control element drive mechanism (CEDM)

4) Pressurizer (PZR)

5) Steam generators (SG)

6) Reactor coolant pumps (RCP)

7) Reactor coolant loop (RCL) piping

The COL applicant is to evaluate the safety-related ESWIS, CCW Hx Building, and BOP components assigned to COL item (COL 19.1(17)) and to confirm that the PRA-based seismic margin assessment is bounding for their specific site, and update the SMA to include site-specific SSC and soil effects (including sliding, overturning, liquefaction, and slope failure) (COL 19.1(7)).

The dominant contributors to the plant HCLPF are provided in Table 19.1-44.