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## 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.: ER 1-8429  
SRP Section: Environmental Report  
Application Section: APR1400 Environmental Report  
Date of RAI Issue: 03/22/2016

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### **Question No. EIS ACC/SAMDA-4**

10 CFR 51.55(a) requires each applicant for a standard design certification under subpart B of 10 CFR Part 52 (i.e., 10 CFR 52.47(b)(2)) to submit with its application a separate document entitled, "Applicant's Environmental Report—Standard Design Certification." The environmental report must address the costs and benefits of severe accident mitigation design alternatives, and the bases for not incorporating severe accident mitigation design alternatives in the design to be certified.

The environmental standard review plan (ESRP) Section 7.3, Severe Accident Mitigation Alternatives, directs the staff to evaluate and independently confirm an applicant's severe accident mitigation design alternatives (SAMDA) analysis presented in an Environmental Report (ER) (i.e., the APR1400 ER, "Applicant's Environmental Report – Standard Design Certification," found under ML15006A038 and the technical report, "Severe Accident Mitigation Design Alternatives (SAMDA) for the APR1400," proprietary under ML15012A105 and nonproprietary under ML15009A246) that applies design and site information along with a cost benefit analysis based on the guidance provided in NUREG/BR-0184. The scope includes the identification and evaluation of design alternatives and procedural modifications that reduce the radiological risk from a severe accident by preventing substantial core damage (i.e., preventing a severe accident) or by limiting releases from containment in the event that substantial core damage occurs (i.e., mitigating the impacts of a severe accident). The purpose of the review is to ensure that plant design changes with the potential for improved severe accident safety performance are identified and evaluated.

The staff requires the following additional information in order to complete its review of the environmental impacts of severe accidents and to ensure appropriate documentation of the applicant's assessment in the APR1400 Environmental Report.

Provide additional documentation in the ER or supporting technical reports to explain the purpose, need and development of Tables 5a through 5f and Tables 6a through 6f of APR1400-E-P-NR-14006-P. The discussion of these tables in Section 6 and 7 of APR1400-E-P-NR-

14006-P is very brief (see pages 17 and 19) and does not provide a rationale as to how the information was developed, why each important basic event is being presented in the tables, and if there is any relationship to the Subsections 7.1 through 7.22 of APR1400-E-P-NR-14006-P.

The NRC staff request that any revisions to the ER or supporting technical reports be provided as a markup as part of the response to this RAI.

The response to this RAI also may need to be reflected in the DCD's FSAR Chapter 19.

This RAI is related to the Environmental Audit Information Needs ER-TI-13 (ML15198A023).

### **Response – (Rev. 2)**

The ASME PRA Standard (ASME/ANS RA-Sb-2013) defines a significant basic event as a basic event that contributes significantly to the computed risks for a specific hazard group. This definition includes any basic event that has an FV importance greater than 0.005 or a RAW importance greater than 2. For the SAMDA analysis (APR1400-E-P-NR-14006-P, [Rev. 1](#)), Tables [6a](#) through [6f](#) include basic events with FV importance greater than 0.005 (0.5%), as the purpose of the SAMDA analysis is to consider ways to reduce risk. The RAW importance parameter does not provide indication of potential risk reduction and is not germane to a SAMDA analysis for risk reduction. Therefore, the RAW importance measure is not used.

Tables [7a](#) through [7f](#) include basic events from the top 100 cutsets that do not have a FV importance greater than 0.005 (0.5%). These basic events were reviewed because they could be considered important based on the order they appear in the cutsets.

NEI-05-01, "Severe Accident Mitigation Alternatives (SAMA) Analysis Guidance Document," allows the open interpretation for the definition of dominant cutsets, provided justification is given. As is documented in the APR1400 DCD Table 19.1-19, the top 100 internal events cutsets contribute approximately [37](#) percent of the total CDF and the number of cutsets that contribute to 95 percent of the CDF is over [290,000](#). Review of additional basic events that do not have a FV importance greater than 0.005 (0.5%) and are outside the top 100 cutsets would have little influence on CDF and are therefore not likely contributors for identification of cost benefit enhancements.

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#### **Impact on DCD**

There is no impact on the DCD.

#### **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**

[The Environmental Report and SAMDA Report are updated to reflect the changes discussed above.](#)