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.:	**60-7972**
SRP Section:	**06.05.03 - Fission Product Control Systems and Structures**
Application Section:	**6.5.2.3.3 Particulate (Aerosol) Removal by Natural Deposition**
Date of RAI Issue:	**07/06/2015**

Question No. 06.05.03-1

In DCD Chapter 15, loss of coolant accident (LOCA) and control element assembly accident design basis accident dose analyses (DBAs) were performed to show compliance with the design and siting criteria in 10 CFR 52.47(a)(2)(iv) and control room habitability dose criteria in GDC 19. For these DBAs which include releases to the containment, DCD Section 6.5.2.3.3 states that aerosol iodine removal in containment by natural deposition was modeled by using the 10th percentile values of the Powers natural deposition correlation in NUREG/CR-6189. Considering that the Powers natural deposition correlation was developed using operating PWR and BWR information on containment geometry and power, demonstrate why the Powers natural deposition correlation is applicable to the APR-1400 containment.

Response

The applicability of the Powers natural deposition model to the APR1400 containment is demonstrated by the correlation provided in Section III.A of NUREG/CR-6189, which specifies the allowable range of containment free volume (V) depending on the thermal power (MW_{th}) of the corresponding plant, as given in Eq. 1 below:

$$V\ (m^3) = (16{,}700 \pm 5{,}500) + (16.16 \pm 1.94) \times P\ (MW_{th}) \qquad \text{(Eq.1)}$$

Substituting the P value in Eq. 1 with the APR1400 nominal thermal power of 3,983 MW_{th}, presented in DCD Subsection 1.1.4, results in an allowable containment free volume range of 6.78×10^4 m^3 to 9.43×10^4 m^3.

Since the containment free volume of the APR1400 of 8.86×10^4 m^3, as presented in DCD Table 6.5-3, is within the lower and upper bounds of the allowable range, the Powers natural

deposition model is demonstrated to be applicable to the APR1400 containment.

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

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