

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.: 21-7913

SRP Section: 02.03.05 - Long-Term Atmospheric Dispersion Estimates for Routine Releases

Application Section: 2.3

Date of RAI Issued: 06/01/2015

Question No. 02.03.05-1

As stated in SRP Section 2.3.5, 10CFR20, subpart D, 10CFR50.34a, 10CFR50 Appendix I, and 10CFR100.21(c)(2) provide the requirements related to long-term atmospheric dispersion estimates for routine releases.

SRP Section 2.3.5 Acceptance Criteria 1 states, in part, that a detailed description of the atmospheric dispersion and deposition models used by the applicant to calculate annual average concentrations in air and amount of material deposited as a result of routine releases of radioactive materials to the atmosphere should be provided. The models should be sufficiently documented and substantiated to allow a review of their accuracy and validity, source configuration, suitability of input parameters, topography, and appropriateness for the site, plant, and release characteristics.

So that the staff may independently conduct a confirmatory analysis to verify the technical acceptability per NRC Regulatory Guide 1.111, please provide any XOQDOQ input and output files used to determine the Annual Average X/Q values at Site Boundary as presented in Table 2.0-1 (2 of 4). These files should include any joint frequency distributions (JFD) used in the analysis as well as a description of what data was used to derive the JFD. Include in this RAI response any assumptions (i.e., release modes) employed during the analysis and update the applicable DCD sections if needed.

Response

The annual average atmospheric dispersion factor (χ/Q) and relative deposition factor (D/Q) are determined using the site-specific meteorological data. However, since a plant site for the APR1400 in the U.S is not determined in the design certification stage, the XOQDOQ calculations using site-specific meteorological data were not performed.

Instead, the bounding conservative χ/Q and D/Q values were determined that envelop the values used at several U.S. operating NPP sites and in previous DC applications. Table 1

compares the APR1400 χ/Q and D/Q values with those for the U.S. operating plants and previous DC applications which were already approved or are currently being reviewed by the NRC.

Table 1. Comparison of APR1400 Annual Average χ/Q and D/Q Values With Other U.S. NPPs and DC Applications

Plant	EAB Site Boundary (m)	Values	
		χ/Q (sec/m ³)	D/Q (1/m ²)
Ginna	500	1.10E-05	1.80E-07
Cook	610	1.13E-05	-
Kewaunee	400	1.20E-06	-
Point Beach	1,200	1.50E-06	-
US-EPR	804	5.00E-06	5.00E-08
US-APWR	800	5.00E-06	4.00E-08
APR1400	800	2.00E-05	2.00E-07

Table 1 shows that the annual average χ/Q (2.0E-05 sec/m³) and relative D/Q (2.0E-07 m⁻²) values used for APR1400 DC application were conservatively selected to bound the values of the U.S. operating plants and other DC applications.

However, when a plant site for the APR1400 in U.S is determined, the annual χ/Q and D/Q will have to be re-calculated by the COL applicant using the site meteorological data as indicated in COL 2.3(1). Then, the COL applicant is to confirm if the site-specific χ/Q values exceed the bounding values described in Tables 2.0-1 of the DCD as specified in COL 2.3(2) in Subsection 2.3.6.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical/Environmental Reports

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

Impact on Technical Specifications

There is no impact on the Technical Specifications.