

REQUEST FOR ADDITIONAL INFORMATION 562-4427 REVISION 2

3/24/2010

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

SRP Section: 02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases
Application Section: Tier 2, Sections 2.0 and 2.3

QUESTIONS for Siting and Accident Conseq Branch (RSAC)

02.03.04-6

The list of atmospheric dispersion factor (χ/Q) key site parameters shown in DCD Tier 1, Table 2.1-1 (sheet 4 of 7) and Tier 2, Table 2.0-1 (Sheet 3 of 8) include ground-level containment releases to the Class 1E electrical room HVAC intake for MCR inleakage. Please explain why there are no χ/Q key site parameter values provided for ground-level containment releases to the other MCR inleakage locations (i.e., reactor building door and auxiliary building intake).

02.03.04-7

DCD Tier 2, Tables 15A-18 through 15A-24 present the atmospheric dispersion (χ/Q) values used to evaluate MCR and TSC dose consequences from a number of different design basis accident events. The information presented in Table 15A-18 (sheet 1 of 2) includes the horizontal and vertical distances between the source and receptors for the steam system piping failure analysis. This type of information is not presented in Tables 15A-19 through 15A-24 for the other design basis accident events. Instead, the information necessary to calculate MCR and TSC χ/Q values (include source-receptor distances) is provided in DCD Tier 2, Tables 2.3-1 through 2.3-3 and Tables 2.3.4-1 through 2.3.4-7. Consequently, please consider deleting the source/receptor horizontal and vertical distance information from Table 15A-18 (sheet 1 of 2).

02.03.04-8

DCD Tier 2, Table 2.3-3, presents receptor height data for use by COL applicants in generating site-specific MCR and TSC χ/Q values. Different values for the heights to the lower and upper limits are presented for two sets of receptors: the reactor building door (west) and the auxiliary building/TSC HVAC intake (north and south). Please explain why the heights to the lower limit are higher than the heights to the upper limit for these two sets of receptors.

02.03.04-9

The following set of comments primarily refers to DCD Tier 2, Tables 2.3.4-1 through 2.3.4-7.

REQUEST FOR ADDITIONAL INFORMATION 562-4427 REVISION 2

- a. DCD Tier 2, Section 2.3.4 states that (1) the 0-8 hr MCR and TSC χ/Q values were calculated based, in part, on the diffusion equations contained in the ARCON96 atmospheric dispersion model and (2) the 8-24 hr, 24-96 hr, and 96-720 hr MCR and TSC χ/Q values were derived from the 0-8 hr χ/Q values by adjusting for long-term meteorological averaging of wind speed and wind direction as described in Section C.4.4 of Regulatory Guide 1.194. The long-term meteorological averaging was generally accomplished by multiplying the 0-8 hr χ/Q values by combined wind speed and wind direction correction factors of (1) 0.59 to obtain the 8-24 hr χ/Q values, (2) 0.38 to obtain the 24-96 hr χ/Q values, and (3) 0.17 to obtain the 96-720 hr χ/Q values.

SRP 2.3.4 states that the site parameters postulated for a standard design certification should be representative of a reasonable number of sites that have been or may be considered for a COL application. In order to confirm that the US-APWR MCR and TSC χ/Q values listed as key site parameters in DCD Tier 1, Table 2.1-1 and DCD Tier 2, Table 2.0-1 are representative of a reasonable number of sites that have been or may be considered for a COL application, the staff generated a set of site-specific MCR and TSC χ/Q values using hourly meteorological data provided in support of the four docketed ESP applications (North Anna, Clinton, Grand Gulf, and Vogtle). The staff executed the ARCON96 computer code with a subset of the source/receptor information presented in DCD Tier 2, Tables 2.3.4-1 through 2.3.4-7 assuming the US-APWR plant north was aligned to true north at each site. The staff found that the US-APWR 0-8 hour, 8-24 hour, and 1-4 day χ/Q values were bounding in all cases, but the US-APWR 4-30 day χ/Q values were not bounding for three out of the four sites. This implies to the staff that the use of a 96-720 hr combined wind speed and wind direction long-term averaging correction factor of 0.17 with the ARCON96 diffusion equations does not produce appropriate results.

Consequently, please consider increasing the 96-720 hr MCR and TSC χ/Q values listed as key site parameters in DCD Tier 1, Table 2.1-1 and DCD Tier 2, Table 2.0-1 to ensure they bound a reasonable number of sites that have been or may be considered for a COL application.

- b. Consider revising DCD Tier 2, Section 2.3.4 (last sentence on page 2.3-2) to appropriately reference DCD Tier 2, Tables 2.3.4-1 through 2.3.4-7.
- c. Please review the title of Table 2.3.4-3 (sheet 9 of 11) shown on page 2.3-35 and correct as necessary.
- d. Regarding Table 2.3.4-3 (Sheet 9 of 11 on page 2.3-35), should the lateral and vertical diffusion coefficients for the ground level containment release point to the north and south TSC HVAC intakes and to the north and south auxiliary building HVAC intakes be listed as 7.98 meters and 5.03 meters, respectively, instead of 0 meters?
- e. The source to receptor horizontal distances between the west main steam relief valve and the south TSC HVAC intake listed in the following tables are inconsistent:
- Table 2.3.4-1 (Sheet 11 of 12 on page 2.3-17)
 - Table 2.3.4-2 (Sheet 7 of 8 on page 2.3-25)
 - Table 2.3.4-3 (Sheet 10 of 11 on page 2.3-36)

REQUEST FOR ADDITIONAL INFORMATION 562-4427 REVISION 2

- f. Please consider deleting Footnote 6 to DCD Tier 2, Tables 2.3.4-1 through 2.3.4-7. The information presented in this footnote describes the process used by MHI to derive the US-APWR MCR and TSC key site parameter χ/Q values; this same information is also presented in DCD Tier 2, Section 2.3.4. The intent of DCD Tier 2, Tables 2.3.4-1 through 2.3.4-7, is to provide the plant configuration data required by COL applicants to calculate site-specific MCR and TSC χ/Q values. To include information in these tables related to the methodology used by MHI to derive the US-APWR χ/Q site parameter values can be confusing to a COL applicant.