**MITSUBISHI HEAVY INDUSTRIES, LTD.**
16-5, KONAN 2-CHOME, MINATO-KU

September 10, 2008

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attention: Mr. Jeffery A. Ciocco,

Docket No. 52-021
MHI Ref: UAP-HF-08179

**Subject: MHI's Responses to US-APWR DCD RAI No. 41 through 44**

**References:**
1) "Request for Additional Information No. 41-771 Revision 0, SRP Section: 02.03.01 – Regional Climatology, Application Section: DCD Tier 2 Section 2.3.6," dated July 30, 2008.
2) "Request for Additional Information No. 42-772 Revision 0, SRP Section: 02.03.04 – Short Term Atmospheric Dispersion Estimates for Accident Releases, Application Section: DCD Tier 2 Appendix 15A," dated July 30, 2008.
3) "Request for Additional Information No. 43-774 Revision 0, SRP Section: 02.03.04 – Short Term Atmospheric Dispersion Estimates for Accident Releases, Application Section: DCD Tier 2 Section 2.3.6," dated July 30, 2008.
4) "Request for Additional Information No. 44-775 Revision 0, SRP Section: 02.03.05 – Long-Term Atmospheric Dispersion Estimates for Routine Releases, Application Section: DCD Tier 2 Section 2.3.5.2," dated July 30, 2008.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") documents as listed in Enclosures.

Enclosed are the responses to 7 RAIs contained within References 1 through 4.

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of the submittals. His contact information is provided below.

Sincerely,

Y. Ogata

Yoshiki Ogata,
General Manager- APWR Promoting Department
Mitsubishi Heavy Industries, LTD.

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Enclosures:

1. "Response to Request for Additional Information No. 41-771 Revision 0"
2. "Responses to Request for Additional Information No. 42-772 Revision 0"
3. "Response to Request for Additional Information No. 43-774 Revision 0"
4. "Response to Request for Additional Information No. 44-775 Revision 0"

CC: J. A. Ciocco
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Enclosure 1

UAP-HF-08130
Docket No. 52-021

Response to Request for Additional Information No. 41-771
Revision 0

September, 2008

## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**9/10/2008**

**US-APWR Design Certification**

**Mitsubishi Heavy Industries**

**Docket No. 52-021**

| | |
|---|---|
| **RAI NO.:** | **NO. 41-771 REVISION 0** |
| **SRP SECTION:** | **02.03.01 - REGIONAL CLIMATOLOGY** |
| **APPLICATION SECTION:** | **02.03.01** |
| **DATE OF RAI ISSUE:** | **07/30/08** |

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**QUESTION NO. : 02.03.01-15**

Clarify the following statement in COL information item 2.3(1): "The COL Applicant ... is to demonstrate the site-specific parameters are qualified by the design, analysis and acceptance criteria established for the US-APWR key design." For example, pursuant to the definitions provided in 10 CFR 52.1, should the term "site-specific parameters" be replaced with the term "site-specific characteristics"? What does the phrase "qualified by the (US-APWR) design, analysis and acceptance criteria" mean?

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**ANSWER:**

It is agreed that the term "site-specific parameters" should be "site-specific characteristics" based on the definitions provided in 10 CFR 52.1 since this is referring to an action required of the COL Applicant.

It is agreed that the phrase "qualified by the (US-APWR) design, analysis and acceptance criteria" should be clarified. The intent of the phrase was to ensure criteria within NUREG-0800, *Standard Review Plan*, Sections 2.3.1 and 2.3.2, Subsections III.4.c are met. The associated statement is "For a COL application referencing a certified design, NRC staff reviews that application to ensure that sufficient information is presented to demonstrate that the characteristics of the site fall within the site parameters specified in the DC rule." The clarification is consistent with the remaining wording in the referenced SRP Sections which read "If there are site parameters associated with this SRP section and if the above condition for these parameters has not been met (i.e., the actual site characteristics do not fall within the certified standard design site parameters), the COL applicant should need to demonstrate by some other means that the proposed facility is acceptable at the proposed site. This might be done by re-analyzing or redesigning the proposed facility."

**Impact on DCD**

DCD Chapter 2, Revision 1 has incorporated the following change:

- The last sentence of Section 2.3 is changed to: "The COL Applicant is to provide site-specific pre-operational and operational programs for meteorological measurements, and is to verify the site-specific regional climatology and local meteorology are bounded by the site parameters for the standard US-APWR design or demonstrate by some other means that the proposed facility and associated site-specific characteristics are acceptable at the proposed site."

**Impact on COLA**

There is no impact on COLA.

**Impact on PRA**

There is no impact on PRA.

This completes MHI's response to the NRC's question.

Enclosure 2

UAP-HF-08130
Docket No. 52-021

Responses to Request for Additional Information No. 42-772
Revision 0

September, 2008

## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**9/10/2008**

**US-APWR Design Certification**

**Mitsubishi Heavy Industries**

**Docket No. 52-021**

| | |
|---|---|
| **RAI NO.:** | **NO.42-772 REVISION 0** |
| **SRP SECTION:** | **02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases** |
| **APPLICATION SECTION:** | **DCD Tier 2 Appendix 15A** |
| **DATE OF RAI ISSUE:** | **7/30/2008** |

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**QUESTION NO. : 02.03.04-1**

Revise DCD Tier 2 Figure 15A-1 to (1) indicate plant north and (2) add the technical support center (TSC) intake and inleakage locations.

The applicant stated in DCD Tier 2 Section 15.6.5.5.1.3 that the dose calculation model used to evaluate main control room (MCR) habitability for the loss-of-coolant accident (including source term, transport, and release assumptions) were also used to evaluate the TSC habitability for the same event. The applicant also stated that the distances from release points to receptors are almost the same between the TSC and MCR; therefore, the radiological consequences in the TSC are represented by those in the MCR. DCD Tier 2 Figure 15A-1 is a site plan showing release locations and MCR receptors. The TSC intake and inleakage locations should be added to Figure 15A-1 to confirm the applicant's statement that the distances from release points to receptors are almost the same between the TSC and MCR.

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**ANSWER:**

Figure 02.03.04-1 is a site plan showing release locations and, MCR and TSC receptors for the US-APWR. MHI will revise DCD Tier 2 Figure 15A-1 to (1) indicate plant north and (2) add the TSC intake and inleakage locations. Modified places from DCD Tier 2 Figure 15A-1 are shown by dotted line frames in Figure 02.03.04-1.

The TSC is located inside the access building. The TSC heating, ventilation, and air conditioning (HVAC) intake and the auxiliary building (A/B) HVAC intake are located on the roof of the A/B. The air enters from same louver to these intakes. The TSC inleakage location for all the DBAs, except for the failure of small lines carrying primary coolant outside of the containment, is assumed to be equal to the TSC HVAC intake location. The access building interior door is assumed to be an inleakage location for the TSC in the failure of small lines carrying primary coolant outside of the containment.

In the failure of small lines carrying primary coolant outside of the containment, the radioactivity in spilled reactor coolant is postulated to be discharged to the atmosphere from the plant vent, and be transferred to the TSC via the TSC HVAC system. However, the $\chi/Q$ values used are based on the conservative assumption that radioactive materials leaked in the A/B are transferred directly to the TSC through the access building interior door. Therefore, $\chi/Q$ values for TSC considers inleakage through the access building interior door.

The MCR and TSC intake and inleakage locations are provided in Table 02.03.04-1(1) through Table 02.03.04-1(6). The distances from sources to receptors for TSC are generally equivalent to or longer than the distances for MCR, except for the loss-of-coolant accident (LOCA) for plant vent pathway, the rod ejection accident for plant vent pathway and the failure of small lines carrying primary coolant outside containment. However, in the LOCA and the rod ejection accident, though distances from plant vent to receptors for the TSC are shorter than those distances for the MCR, distances from other sources to receptors for the TSC are longer than those distances for the MCR, so that the TSC dose is less than the MCR dose. Though the TSC dose due to the failure of small lines is larger than the MCR dose in that event the TSC dose due to failure of small lines is bounded by the MCR dose during the LOCA. Therefore the radiological consequences in the TSC are bounded by those in the MCR.

**Table 02.03.04-1(1) Combination of Sources and Receptors for Steam System Piping Failure Analysis in the DCD**

| **Accidents** | **Steam system piping failure** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sources | Main steam line break releases<br>(4)[1] | | | | Main steam relief valve and safety valve releases<br>(5)[1] | | | |
| Receptors | **MCR** | | **TSC** | | **MCR** | | **TSC** | |
| | Intake | Inleak | Intake | Inleak | Intake | Inleak | Intake | Inleak |
| | MCR HVAC intake<br>(a)[1] | MCR HVAC intake<br>(a)[1] | TSC HVAC intake<br>(e)[1] | TSC HVAC intake<br>(e)[1] | Class 1E electrical room HVAC intake<br>(d)[1] | Class 1E electrical room HVAC intake<br>(d)[1] | TSC HVAC intake<br>(e)[1] | TSC HVAC intake<br>(e)[1] |
| Horizontal distance (m) | 17 | 17 | 67 | 67 | 24 | 24 | 60 | 60 |
| Vertical distance (m) | 0 | 0 | 0 | 0 | 22 | 22 | 13 | 13 |
| Straight distance (m) | 17 | 17 | 67 | 67 | 33 | 33 | 61 | 61 |

NOTE:
(1) The inside of a parenthesis shows the source locations and receptor locations of the Figure 02.03.04-1.

**Table 02.03.04-1(2)**
**Combination of Sources and Receptors for RCP Rotor Seizure Analysis in the DCD**

| Accidents | RCP rotor seizure accident | | | |
|---|---|---|---|---|
| Sources | Main steam relief valve and safety valve releases | | | |
| | (5) [1] | | | |
| Receptors | MCR | | TSC | |
| | Intake | Inleak | Intake | Inleak |
| | Class 1E electrical room HVAC intake | Class 1E electrical room HVAC intake | TSC HVAC intake | TSC HVAC intake |
| | (d) [1] | (d) [1] | (e) [1] | (e) [1] |
| Horizontal distance (m) | 24 | 24 | 60 | 60 |
| Vertical distance (m) | 22 | 22 | 13 | 13 |
| Straight distance (m) | 33 | 33 | 61 | 61 |

NOTE:
(1) The inside of a parenthesis shows the source locations and receptor locations of the Figure 02.03.04-1.

**Table 02.03.04-1(3)**
**Combination of Sources and Receptors for Rod Ejection Accident Analysis in the DCD (Sheet 1 of 2)**

| Accidents | Rod ejection accident | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sources | Plant vent | | | | Ground level containment release point | | | |
| | (7) [1] | | | | (2) [1] | (1) [1] | (3) [1] | |
| Receptors | MCR | | TSC | | MCR | | TSC | |
| | Intake | Inleak | Intake | Inleak | Intake | Inleak | Intake | Inleak |
| | MCR HVAC intake | Auxiliary building HVAC intake | TSC HVAC intake | TSC HVAC intake | MCRHVAC intake | Class 1E electrical room HVAC intake | TSC HVAC intake | TSC HVAC intake |
| | (a) [1] | (c) [1] | (e) [1] | (e) [1] | (a) [1] | (d) [1] | (e) [1] | (e) [1] |
| Horizontal distance (m) | 56 | 55 | 55 | 55 | 32 | 27 | 44 | 44 |
| Vertical distance (m) | 52 | 43 | 43 | 43 | 32 | 33 | 22 | 22 |
| Straight distance (m) | 77 | 69 | 69 | 69 | 45 | 42 | 50 | 50 |

NOTE:
(1) The inside of a parenthesis shows the source locations and receptor locations of the Figure 02.03.04-1.

**Table 02.03.04-1(3)**
**Combination of Sources and Receptors for Rod Ejection Accident Analysis in the DCD (Sheet 2 of 2)**

| **Accidents** | **Rod ejection accident** | | | |
|---|---|---|---|---|
| Sources | Main steam relief valve and safety valve releases | | | |
| | (5) [1] | | | |
| Receptors | **MCR** | | **TSC** | |
| | Intake | Inleak | Intake | Inleak |
| | Class 1E electrical room HVAC intake | Class 1E electrical room HVAC intake | TSC HVAC intake | TSC HVAC intake |
| | (d) [1] | (d) [1] | (e) [1] | (e) [1] |
| Horizontal distance (m) | 24 | 24 | 60 | 60 |
| Vertical distance (m) | 22 | 22 | 13 | 13 |
| Straight distance (m) | 33 | 33 | 61 | 61 |

NOTE:
(1) The inside of a parenthesis shows the source locations and receptor locations of the Figure 02.03.04-1.

**Table 02.03.04-1(4)**
**Combination of Sources and Receptors for Failure of Small Lines Carrying Primary Coolant Outside Containment and Steam Generator Tube Rupture (SGTR) analyses in the DCD**

| **Accidents** | **Failure of small lines carrying primary coolant outside containment** | | | | **SGTR** | | | |
|---|---|---|---|---|---|---|---|---|
| Sources | Auxiliary building (Reactor coolant system sample line) (8)[1] | | | | Main steam relief valve and safety valve releases (5)[1] | | | |
| Receptors | **MCR** | | **TSC** | | **MCR** | | **TSC** | |
| | Intake | Inleak | Intake | Inleak | Intake | Inleak | Intake | Inleak |
| | MCR HVAC intake (a)[1] | Reactor building door (b)[1] | Access building door (f)[1] | Access building door (f)[1] | Class 1E electrical room HVA C intake (d)[1] | Class 1E electrical room HVAC intake (d)[1] | TSC HVAC intake (e)[1] | TSC HVAC intake (e)[1] |
| Horizontal distance (m) | 52 | 34 | 23 | 23 | 24 | 24 | 60 | 60 |
| Vertical distance (m) | 7 | 0 | 0.9 | 0.9 | 22 | 22 | 13 | 13 |
| Straight distance (m) | 52 | 34 | 23 | 23 | 33 | 33 | 61 | 61 |

NOTE:
(1) The inside of a parenthesis shows the source locations and receptor locations of the Figure 02.03.04-1.

**Table 02.03.04-1(5)**
**Combination of Sources and Receptors for LOCA Analysis in the DCD**

| Accidents | LOCA | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sources | Plant vent | | | | Ground level containment release point | | | |
| | (7) [1] | | | | (2) [1] | (1) [1] | (3) [1] | |
| Receptors | **MCR** | | **TSC** | | **MCR** | | **TSC** | |
| | Intake | Inleak | Intake | Inleak | Intake | Inleak | Intake | Inleak |
| | MCR HVAC intake | Reactor building door | TSC HVAC intake | TSC HVAC intake | MCR HVAC intake | Class 1E electrical room HVAC intake | TSC HVAC intake | TSC HVAC intake |
| | (a) [1] | (b) [1] | (e) [1] | (e) [1] | (a) [1] | (d) [1] | (e) [1] | (e) [1] |
| Horizontal distance (m) | 56 | 37 | 55 | 55 | 32 | 27 | 44 | 44 |
| Vertical distance (m) | 52 | 60 | 43 | 43 | 32 | 33 | 22 | 22 |
| Straight distance (m) | 77 | 71 | 69 | 69 | 45 | 42 | 50 | 50 |

NOTE:
(1) The inside of a parenthesis shows the source locations and receptor locations of the Figure 02.03.04-1.

**Table 02.03.04-1(6)**
**Combination of Sources and Receptors for Fuel Handling Accident Analysis in the DCD**

| Accidents | Fuel handling accident in the containment | | | | Fuel handling accident in the fuel handling area | | | |
|---|---|---|---|---|---|---|---|---|
| Sources | Air lock of containment (9) [1] | | Equipment hatch of containment (10) [1] | | Fuel handling area (6) [1] | | | |
| Receptors | MCR | | TSC | | MCR | | TSC | |
| | Intake | Inleak | Intake | Inleak | Intake | Inleak | Intake | Inleak |
| | MCR HVAC intake (a) [1] | Class 1E electrical room HVAC intake (d) [1] | TSC HVAC intake (e) [1] | TSC HVAC intake (e) [1] | MCR HVAC intake (a) [1] | Class 1E electrical room HVAC intake (d) [1] | TSC HVAC intake (e) [1] | TSC HVAC intake (e) [1] |
| Horizontal distance (m) | 35 | 29 | 80 | 80 | 82 | 76 | 100 | 100 |
| Vertical distance (m) | 5.2 | 5.8 | 0.6 | 0.6 | 8.5 | 8.5 | 17 | 17 |
| Straight distance (m) | 35 | 30 | 80 | 80 | 83 | 76 | 105 | 105 |

NOTE:
(1) The inside of a parenthesis shows the source locations and receptor locations of the Figure 02.03.04-1.

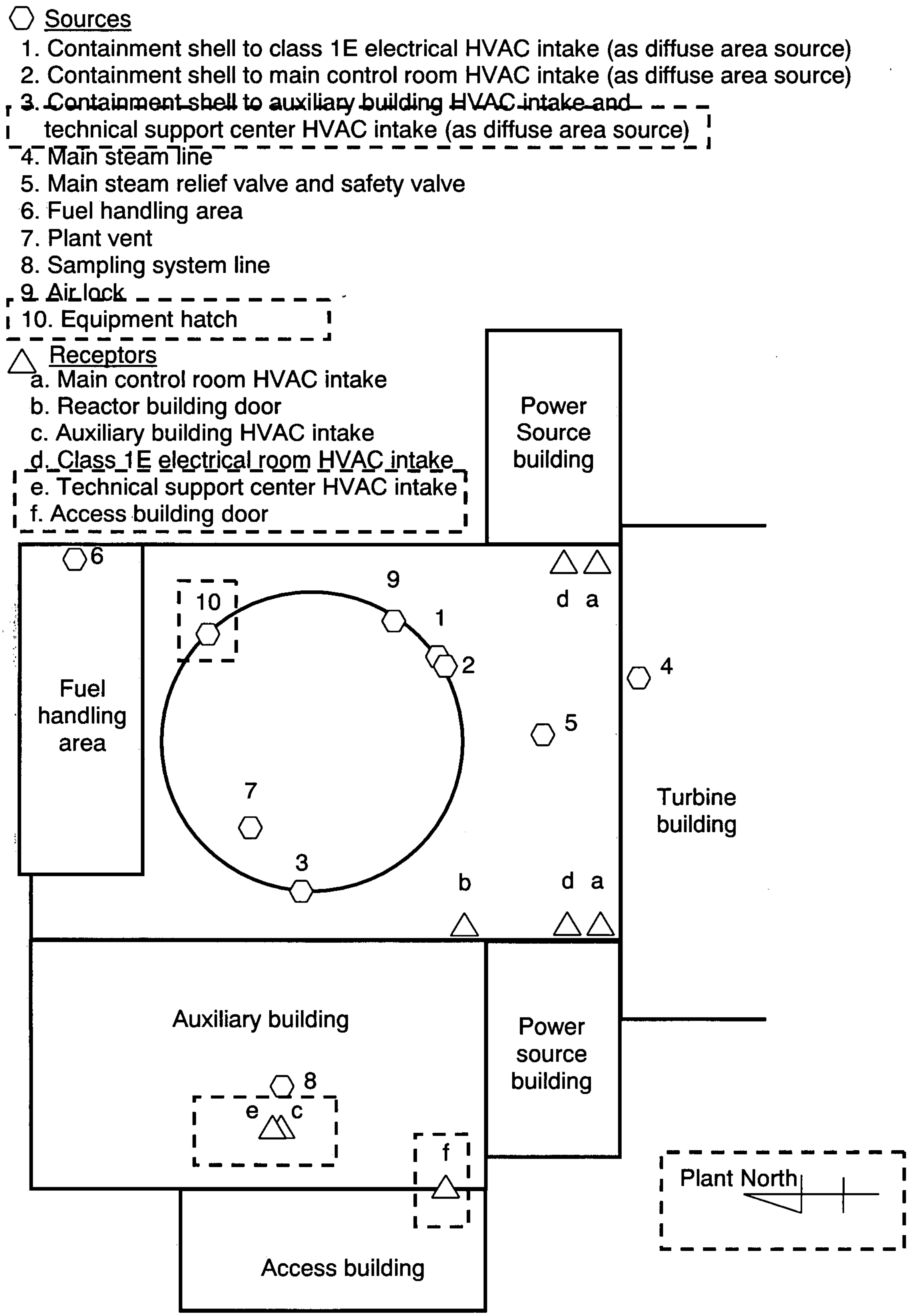


**Figure 02.03.04-1 Site Plan with Release and Intake Locations**

**Impact on DCD**

The DCD will be changed in Revision 2 to incorporate the following:

- Revise DCD Tier 2 Figure 15A-1 to indicate plant north and add the technical support center (TSC) intake and inleakage locations as indicated in Figure 02.03.04-1.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.

9/10/2008

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

| | |
|---|---|
| **RAI NO.:** | **NO.42-772 REVISION 0** |
| **SRP SECTION:** | **02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases** |
| **APPLICATION SECTION:** | **DCD Tier 2 Appendix 15A** |
| **DATE OF RAI ISSUE:** | **7/30/2008** |

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**QUESTION NO. : 02.03.04-2**

Add a table of ARCON96 source/receptor inputs to the DCD for use by all future COL applicants. The table should identify ARCON96 inputs for each main control room (MCR) and technical support center (TSC) source/receptor combination developed in accordance with the guidance provided in RG 1.194 (e.g., release height above plant grade, intake height above plant grade, horizontal distance between the release point and intake, direction from the intake to source in degrees from plant north, vent vertical velocity, stack flow, stack radius, building area, diffuse source initial lateral and vertical diffusion coefficients).

Review Procedure 6.b of SRP 2.3.4 states the DC application should contain figures and tables showing the design features that would be used by COL applicants to generate MCR $\chi/Q$ values. RG 1.194 presents criteria for characterizing atmospheric dispersion conditions for evaluating the consequences of radiological releases to the MCR. RG 1.194 endorses the ARCON96 atmospheric dispersion computer code (Revision 1 to NUREG-6331) as an acceptable methodology for determining MCR $\chi/Q$ values for use in design basis accident radiological analyses. The ARCON96 source/receptor inputs required to generate TSC $\chi/Q$ values should be added to this table as well.

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**ANSWER:**

MHI will add the following sentences and tables in the Section 2.3 of the DCD Chapter 2.

The necessary data for COL applicant to calculate $\chi/Q$ values of MCR by using ARCON96 are shown as Tables 2.3-1, 2.3-2 and 2.3-4. The necessary data for COL applicant to calculate $\chi/Q$ values of TSC by using ARCON96 are also shown as Tables 2.3-1, 2.3-3 and 2.3-4.

**Table 2.3-1 Common input parameters for $\chi/Q$ calculation of MCR and TSC**

| **Common parameter** | |
|---|---|
| Building area ($m^2$) | 2000 [(1)] |
| Plant vent vertical velocity (m/s) | NA [(2)] |
| Stack flow ($m^3/s$) | 0 [(3)] |
| Stack radius (m) | 0 [(4)] |
| Elevation difference (m) | 0 |
| Initial diffusion coefficient (m) (Lateral) [(5)] | 7.98 |
| Initial diffusion coefficient (m) (Vertical) [(5)] | 5.03 |

NOTES:

(1) According to the RG 1.194, the default value (2000 $m^2$) is used to reasonably calculate.
(2) The plant vent vertical velocity is not used due to ground release.
(3) The stack flow is conservatively set to zero. (See the RG 1.194.)
(4) The stack radius is set to zero according to the RG 1.194 due to zero stack flow.
(5) Initial diffusion coefficient (Lateral, Vertical) are used only for the case when the source is from the surface of containment.

**Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 1 of 10)**

| Sources | Plant vent[4] | | Ground level containment release point[3][4] | | Main steam line break releases | | Main steam safety valve release[5] | | Main steam relief valve release[5] | |
|---|---|---|---|---|---|---|---|---|---|---|
| Receptors | Control room HVAC intake (East) | Control room HVAC intake (West) | Control room HVAC intake (East) | Control room HVAC intake (West) | Control room HVAC intake (East) | Control room HVAC intake (West) | Control room HVAC intake (East) | Control room HVAC intake (West) | Control room HVAC intake (East) | Control room HVAC intake (West) |
| Horizontal distance[1](m) | 68 | 56 | 32 | 32 | 17 | 25 | 26 | 26 | 31 | 31 |
| Vertical distance[1](m) | −52 | −52 | −32 | −32 | 0.0 | −8.8 | −21 | −21 | −23 | −23 |
| Direction[2] (degree) | 321 | 21 | 325 | 35 | 256 | 93 | 291 | 69 | 309 | 51 |

Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 2 of 10)

| Sources | Fuel handling area(6) | | Equipment hatch(7) | | Air lock of containment (North)(7) | | Air lock of containment (South)(7) | | Reactor coolant system sample line(8) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Receptors | Control room HVAC intake (East) | Control room HVAC intake (West) | Control room HVAC intake (East) | Control room HVAC intake (West) | Control room HVAC intake (East) | Control room HVAC intake (West) | Control room HVAC intake (East) | Control room HVAC intake (West) | Control room HVAC intake (East) | Control room HVAC intake (West) |
| Horizontal distance(1)(m) | 82 | 105 | 62 | 80 | 72 | 80 | 35 | 63 | 78 | 52 |
| Vertical distance(1)(m) | 8.5 | 8.5 | −5.2 | −5.2 | 7.3 | 7.3 | −5.2 | −5.2 | 7.0 | 7.0 |
| Direction(2) (degree) | 360 | 38 | 347 | 34 | 342 | 32 | 342 | 58 | 316 | 335 |

Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 3 of 10)

| Sources | Plant vent[4] | | Ground level containment release point[3][4] | | Main steam line break releases | | Main steam safety valve release[5] | | Main steam relief valve release[5] | |
|---|---|---|---|---|---|---|---|---|---|---|
| Receptors | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) |
| Horizontal distance[1] (m) | 68 | 56 | 32 | 32 | 17 | 25 | 26 | 26 | 31 | 31 |
| Vertical distance[1] (m) | −52 | −52 | −32 | −32 | 0.0 | −8.8 | −21 | −21 | −23 | −23 |
| Direction[2] (degree) | 321 | 21 | 325 | 35 | 256 | 93 | 291 | 69 | 309 | 51 |

Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 4 of 10)

| Sources | Fuel handling area[6] | | Equipment hatch[7] | | Air lock of containment (North)[7] | | Air lock of containment (South)[7] | | Reactor coolant system sample line[8] | |
|---|---|---|---|---|---|---|---|---|---|---|
| Receptors | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) | Class 1E electrical room HVAC intake (South-east) | Class 1E electrical room HVAC Intake (South-west) |
| Horizontal distance[1] (m) | 82 | 105 | 62 | 80 | 72 | 80 | 35 | 63 | 78 | 52 |
| Vertical distance[1] (m) | 8.5 | 8.5 | −5.2 | −5.2 | 7.3 | 7.3 | −5.2 | −5.2 | 7.0 | 7.0 |
| Direction[2] (degree) | 360 | 38 | 347 | 34 | 342 | 32 | 342 | 58 | 316 | 335 |

Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 5 of 10)

| Sources | Plant vent[(4)] | | Ground level containment release point[(3)(4)] | | Main steam line break releases | | Main steam safety valve release[(5)] | | Main steam relief valve release[(5)] | |
|---|---|---|---|---|---|---|---|---|---|---|
| Receptors | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) |
| Horizontal distance[(1)] (m) | 63 | 50 | 27 | 27 | 20 | 26 | 24 | 24 | 27 | 27 |
| Vertical distance[(1)] (m) | −53 | −53 | −33 | −33 | 0.0 | −9.8 | −22 | −22 | −24 | −24 |
| Direction[(2)] (degree) | 317 | 24 | 320 | 40 | 234 | 110 | 277 | 83 | 299 | 61 |

Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 6 of 10)

| Sources | Fuel handling area(6) | | Equipment hatch(7) | | Air lock of containment (North)(7) | | Air lock of containment (South)(7) | | Reactor coolant system sample line(8) | |
|---|---|---|---|---|---|---|---|---|---|---|
| Receptors | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) | Class 1E electrical room HVAC intake (North-east) | Class 1E electrical room HVAC intake (North-west) |
| Horizontal distance(1) (m) | 76 | 100 | 56 | 75 | 66 | 75 | 29 | 60 | 73 | 46 |
| Vertical distance(1) (m) | 8.5 | 8.5 | −5.8 | −5.8 | 7.3 | 7.3 | −5.8 | −5.8 | 7.0 | 7.0 |
| Direction(2) (degree) | 360 | 41 | 346 | 36 | 340 | 35 | 338 | 64 | 313 | 331 |

Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 7 of 10)

| Sources | Plant vent(4) | | Ground level containment release point(3)(4) | | Main steam line break releases | | Main steam safety valve release(5) | | Main steam relief valve release(5) | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Receptors** | **Auxiliary building HVAC intake (North)** | **Auxiliary building HVAC intake (South)** | **Auxiliary building HVAC intake (North)** | **Auxiliary building HVAC intake (South)** | **Auxiliary building HVAC intake (North)** | **Auxiliary building HVAC intake (South)** | **Auxiliary building HVAC intake (North)** | **Auxiliary building HVAC intake (South)** | **Auxiliary building HVAC intake (North)** | **Auxiliary building HVAC intake (South)** |
| Horizontal distance(1) (m) | 55 | 60 | 44 | 46 | 84 | 67 | 72 | 61 | 69 | 60 |
| Vertical distance(1) (m) | −43 | −43 | −22 | −22 | 0.0 | 0.0 | −11 | −11 | −13 | −13 |
| Direction(2) (degree) | 92 | 65 | 98 | 75 | 135 | 118 | 125 | 103 | 121 | 98 |

Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 8 of 10)

| Sources | Fuel handling area[6] | | Equipment hatch[7] | | Air lock of containment (North)[7] | | Air lock of containment (South)[7] | |
|---|---|---|---|---|---|---|---|---|
| Receptors | Auxiliary building HVAC intake (North) | Auxiliary building HVAC intake (South) | Auxiliary building HVAC intake (North) | Auxiliary building HVAC intake (South) | Auxiliary building HVAC intake (North) | Auxiliary building HVAC intake (South) | Auxiliary building HVAC intake (North) | Auxiliary building HVAC intake (South) |
| Horizontal distance[1] (m) | 103 | 114 | 80 | 88 | 79 | 87 | 92 | 89 |
| Vertical distance[1] (m) | 17 | 17 | 0.6 | 0.6 | 16 | 16 | 0.6 | 0.6 |
| Direction[2] (degree) | 75 | 61 | 82 | 64 | 81 | 63 | 104 | 87 |

Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 9 of 10)

| Sources | Plant vent[4] | Ground level containment release point[3][4] | Main steam line break releases | Main steam safety valve release[5] | Main steam relief valve release[5] |
|---|---|---|---|---|---|
| Receptors | Reactor building door | Reactor building door | Reactor building door | Reactor building door | Reactor building door |
| Horizontal distance[1](m) | 37 | 17 | 33 | 24 | 24 |
| Vertical distance[1](m) | −60 | −39 | −16 | −29 | −30 |
| Direction[2] (degree) | 33 | 53 | 132 | 101 | 88 |

**Table 2.3-2 Combination of Sources and Receptors for MCR (Sheet 10 of 10)**

| Sources | Fuel handling area(6) | Equipment hatch(7) | Air lock of containment (North)(7) | Air lock of containment (South)(7) | Reactor coolant system sample line(8) |
|---|---|---|---|---|---|
| **Receptors** | **Reactor building door** | **Reactor building door** | **Reactor building door** | **Reactor building door** | **Reactor building door** |
| Horizontal distance(1)(m) | 89 | 64 | 64 | 55 | 34 |
| Vertical distance(1)(m) | 1.5 | −12 | 0.3 | −12 | 0.0 |
| Direction(2) (degree) | 47 | 44 | 42 | 77 | 320 |

NOTES:

(1) Distance from sources to receptors.

(2) The angle of receptors from Plant North centering on sources (Direction increases in a clockwise fashion based on the Plant North, i.e. The Plant North is 0 degree.)

(3) Area source

(4) These parameters are used for a loss-of-coolant accident (LOCA) and a rod ejection accident.

(5) These parameters are used for a steam generator tube rupture, a steam system piping failure, a reactor coolant pump rotor seizure and a rod ejection accident.

(6) These parameters are used for a fuel handling accident occurring in the fuel storage and handling area.

(7) These parameters are used for a fuel-handling accident inside the containment.

(8) These parameters are used for a failure of small lines carrying primary coolant outside containment.

It should be noted that the $\chi/Q$ values of MCR can not be directly calculated by ARCON96 itself because there is no site specific meteorological data in the stage of the DCD. Therefore, the diffusion equations described in ARCON96 (e.g. Revision 1 to NUREG-6331) are used for calculating the $\chi/Q$ values of MCR, together with the conservative meteorological condition based on RG 1.194 (e.g., F stability with wind speeds of 1.0 m/s).

**Table 2.3-3 Combination of Sources and Receptors for TSC (Sheet 1 of 2)**

| Sources | Plant vent[4] | | Ground level containment release point[3][4] | | Main steam line break releases | | Main steam safety valve release[5] | | Main steam relief valve release[5] | |
|---|---|---|---|---|---|---|---|---|---|---|
| Receptors | Technical support center HVAC intake (North) | Technical support center HVAC intake (South) | Technical support center HVAC intake (North) | Technical support center HVAC intake (South) | Technical support center HVAC intake (North) | Technical support center HVAC intake (South) | Technical support center HVAC intake (North) | Technical support center HVAC intake (South) | Technical support center HVAC intake (North) | Technical support center HVAC intake (South) |
| Horizontal distance[1] (m) | 55 | 60 | 44 | 46 | 84 | 67 | 72 | 61 | 69 | 60 |
| Vertical distance[1] (m) | −43 | −43 | −22 | −22 | 0.0 | 0.0 | −11 | −11 | −13 | −13 |
| Direction[2] (degree) | 92 | 65 | 98 | 75 | 135 | 118 | 125 | 103 | 121 | 98 |

Table 2.3-3 Combination of Sources and Receptors for TSC (Sheet 2 of 2)

| **Sources** | **Fuel handling area**(6) | | **Equipment hatch**(7) | | **Air lock of containment (North)**(7) | | **Air lock of containment (South)**(7) | | **Reactor coolant system sample line**(8) |
|---|---|---|---|---|---|---|---|---|---|
| **Receptors** | **Technical support center HVAC intake (North)** | **Technical support center HVAC intake (South)** | **Technical support center HVAC intake (North)** | **Technical support center HVAC intake (South)** | **Technical support center HVAC intake (North)** | **Technical support center HVAC intake (South)** | **Technical support center HVAC intake (North)** | **Technical support center HVAC intake (South)** | **Access building door** |
| Horizontal distance(1) (m) | 103 | 114 | 80 | 88 | 79 | 87 | 92 | 89 | 23 |
| Vertical distance(1) (m) | 17 | 17 | 0.6 | 0.6 | 16 | 16 | 0.6 | 0.6 | 0.9 |
| Direction(2) (degree) | 75 | 61 | 82 | 64 | 81 | 63 | 104 | 87 | 32 |

NOTES:

(1) Distance from sources to receptors.

(2) The angle of receptors from Plant North centering on sources (Direction increases in a clockwise fashion based on the Plant North, i.e. The Plant North is 0 degree.)

(3) Area source

(4) These parameters are used for a loss-of-coolant accident (LOCA) and a rod ejection accident.

(5) These parameters are used for a steam generator tube rupture, a steam system piping failure, a reactor coolant pump rotor seizure and a rod ejection accident.

(6) These parameters are used for a fuel handling accident occurring in the fuel storage and handling area.

(7) These parameters are used for a fuel-handling accident inside the containment.

(8) These parameters are used for a failure of small lines carrying primary coolant outside containment.

It should be noted that the $\chi/Q$ values of TSC can not be directly calculated by ARCON96 itself because there is no site specific meteorological data in the stage of the DCD. Therefore, the diffusion equations described in ARCON96 (e.g. Revision 1 to NUREG-6331) are used for calculating the $\chi/Q$ values of TSC, together with the conservative meteorological condition based on RG 1.194 (e.g., F stability with wind speeds of 1.0 m/s).

**Table 2.3-4 Source heights**

| | Height [1] (m) |
|---|---|
| Containment | 49.4 |
| Plant vent | 69.8 |
| Main steam line (East) | 12.8 |
| Main steam line (West) | 26.2 |
| Main steam relief valve | 40.5 |
| Main steam safety valve | 38.7 |
| Fuel handling area | 5.8 |
| Equipment hatch | 22.3 |
| Air lock (North) | 6.7 |
| Air lock (South) | 22.3 |
| Reactor coolant system sample line | 7.3 |

NOTE:

(1) The distance is from the ground level.

**Impact on DCD**

The DCD will be changed in Revision 2 to incorporate the following:

- Tables 2.3-1, 2.3-2, 2.3-3, and 2.3-4 are to be added at the end of Section 2.3.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.

9/10/2008

**US-APWR Design Certification**

**Mitsubishi Heavy Industries**

**Docket No. 52-021**

| | |
|---|---|
| **RAI NO.:** | **NO.42-772 REVISION 0** |
| **SRP SECTION:** | **02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases** |
| **APPLICATION SECTION:** | **DCD Tier 2 Appendix 15A** |
| **DATE OF RAI ISSUE:** | **7/30/2008** |

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**QUESTION NO. : 02.03.04-3**

Justify the main control room (MCR) intake and inleakage locations selected for each postulated accident and anticipated operational occurrence listed in DCD Tier 2 Tables 15A-18 through 15A-23. In particular, address the following:

(a) Why isn't the MCR HVAC intake listed as a receptor for the steam system piping failure, reactor cooling pump rotor seizure, rod ejection, and steam generator tube rupture postulated accidents?

(b) Why is the auxiliary building HVAC intake listed as an inleakage location for the rod ejection accident plant vent release pathway whereas the reactor building door is listed as an inleakage location for the loss-of-coolant accident plant vent release pathway?

(c) Why is the auxiliary building HVAC intake listed as an inleakage location for the rod ejection accident ground level containment release pathway whereas the class 1E electrical room HVAC intake is listed as the loss-of-coolant accident ground level containment release pathway?

---

**ANSWER:**

In principle, the MCR HVAC intake is selected as an intake location, while an inleakage location is selected from among the reactor building (R/B) door (communicating with the pathway in front of MCR), class 1E electrical room HVAC intake (external air drawn in by the class 1E electrical room HVAC may leak through negative pressure sections of the MCR HVAC equipment), and auxiliary building (A/B) HVAC intake (external air drawn in by the A/B HVAC is fed to the pathway in front of MCR) such that the direct distance from a release point will be shortest.

When the $\chi/Q$ value from inleakage is smaller than that of the intake, the $\chi/Q$ value for inleakage is set equal to the $\chi/Q$ of the intake. On the other hand, if the $\chi/Q$ value from inleakage is larger than that of the intake, but the difference is 10% or less, the $\chi/Q$ value for intake is set equal to that of the inleakage (RADTRAD Ver.3.03 allows only one set of $\chi/Q$ values to be used in one calculation. These assumptions allow a reduced number of calculations). Thus, inleakage and intake dispersion from the main steam safety valve become identical. Intakes for the steam system piping failure, reactor coolant pump rotor seizure accident, rod ejection accident and steam generator tube rupture have $\chi/Q$ values different from those for the MCR HVAC. The intake location from the steam line at the time of steam system piping failure is the MCR HVAC intake and the distance from a rupture location is the same as the case of class 1E electrical room HVAC intake (Refer to answer to 02.03.04-2). This is the reason why $\chi/Q$ values are identical. In case of DCD Revision 0, focusing on the difference from inleakage (the difference was 10% or less), the class 1E electrical room HVAC intake was listed as the representative receptor. However, in DCD Revision 1 both the HVAC intake and the inleakage location are represented by MCR HVAC intake because of the same $\chi/Q$ values.

As regards the plant vent release pathway and ground level containment release pathway, the A/B HVAC intake is used because it has a shorter straight distance from the rupture location when compared to both the R/B door and class 1E electrical room HVAC intake. In the case of an accident when emergency core cooling system (ECCS) actuation signal is not issued, A/B HVAC continues its actuation. In the case of a LOCA when ECCS actuation signal is generated, the A/B HVAC stops. In case of rod ejection accident, it is anticipated that it takes considerable time before the ECCS actuation signal is emitted and the A/B HVAC is conservatively assumed to continue its actuation. Therefore the LOCA and rod ejection accident have different assumed inleakage positions.

**Impact on DCD**

There is no impact on the DCD.

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.

## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**9/10/2008**

**US-APWR Design Certification**

**Mitsubishi Heavy Industries**

**Docket No. 52-021**

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|---|---|
| **RAI NO.:** | **NO.42-772 REVISION 0** |
| **SRP SECTION:** | **02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases** |
| **APPLICATION SECTION:** | **DCD Tier 2 Appendix 15A** |
| **DATE OF RAI ISSUE:** | **7/30/2008** |

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**QUESTION NO. : 02.03.04-4**

Revise the DCD to discuss in greater detail the methodology (e.g., atmospheric dispersion models, input assumptions, and meteorological data sets) used to select the exclusion area boundary (EAB), low population zone (LPZ), and main control room (MCR) atmospheric dispersion factors presented as key site parameters in DCD Tier 1 Table 2.1-1 and Tier 2 Table 2.0-1. Discuss how this methodology ensures that the selected key site parameter values bound a reasonable number of sites that have been or may be considered for a COL application.

Review Procedure 6.b of SRP 2.3.4 states site parameters should be representative of a reasonable number of sites that may be considered within a COL application and a basis should be provided for each of the site parameters.

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## ANSWER:

It is agreed to discuss the methodology, bounding of a reasonable number of sites in more detailed, and the basis for each of the site parameters.

**Impact on DCD**

The DCD will be changed in Revision 2 to incorporate the following:

- Replace the second paragraph of Subsection 2.3.4 with the following:

"The short-term $\chi/Q$ values are site-specific parameters. The $\chi/Q$ values listed in Table 2.0-1 are bounding factors for a typical US-APWR sited in most areas of the US and can be used to calculate radiological consequences of design basis accidents. There is no site specific meteorological data in the stage of the DCD. The atmospheric dispersion factors ($\chi/Q$ values) are determined as follows.

The US-APWR $\chi/Q$ value of EAB should be determined as the representative of the US plants. Therefore, the US-APWR $\chi/Q$ value of EAB is selected to envelop most values at the corresponding EAB distance (0.5 miles) of the many existing plants. This value is reasonable in comparison with the existing plants values with different EAB distances.

The $\chi/Q$ values of LPZ are also determined by using the same method as EAB at every time interval. However, the LPZ distance of US-APWR can not be specified in the stage of the DCD. Therefore, the US-APWR $\chi/Q$ values of LPZ are determined to envelop most $\chi/Q$ values of many existing plants with LPZ distance of more than 1 mile.

The 0-8 hrs $\chi/Q$ values of MCR are calculated by some formula based on both the diffusion equations used in ARCON96 (e.g. Revision 1 to NUREG-6331) and the conservative meteorological condition referred to RG 1.194 (e.g. F stability and wind speeds of 1.0 m/s), not directly by ARCON96 itself. In this calculation formula, a multiplier is introduced to envelop the most $\chi/Q$ values of MCR of many existing plants.

By using the $\chi/Q$ values of MCR at various source-receptor distances of many existing plants, it is ensured that the above calculation formula envelops the most $\chi/Q$ values of the existing plants at any source-receptor distance, and then the US-APWR $\chi/Q$ values of MCR are determined by this calculation formula.

The other time interval $\chi/Q$ values (8-24 hrs, 24-96 hrs, 96-720 hrs) of MCR are calculated by using both the above formula of 0-8 hrs $\chi/Q$ values and the time interval factors described in RG 1.194 regulatory position 4.4. These calculated $\chi/Q$ values also envelop most existing plants values.

As a result, the US-APWR $\chi/Q$ values of EAB, LPZ and MCR in DCD Tier 2 Table 2.0-1 are representative of a reasonable number of the existing plants values. The COL Applicant is to provide conservative factors as described in SRP 2.3.4 (Reference 2.3-2). If a selected site will cause excess to the bounding $\chi/Q$ values, then the COL Applicant is to demonstrate how the dose reference values in 10 CFR 52.79(a)(1)(vi) (Reference 2.3-3) and the control room dose limits in 10 CFR 50, Appendix A, General Design Criteria 19 (Reference 2.3-4) are met using site-specific $\chi/Q$ values."

**Impact on COLA**

There is no impact on the COLA.

**Impact on PRA**

There is no impact on the PRA.

This completes MHI's responses to the NRC's questions.

Enclosure 3

UAP-HF-08130
Docket No. 52-021

Response to Request for Additional Information No. 43-774
Revision 0

September, 2008

## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**9/10/2008**

**US-APWR Design Certification**

**Mitsubishi Heavy Industries**

**Docket No. 52-021**

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|---|---|
| **RAI NO.:** | **NO.43-774 REVISION 0** |
| **SRP SECTION:** | **02.03.04 - Short Term Atmospheric Dispersion Estimates for Accident Releases** |
| **APPLICATION SECTION:** | **02.03.06** |
| **DATE OF RAI ISSUE:** | **7/30/2008** |

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**QUESTION NO. : 02.03.04-5**

Revise COL information item 2.3(2) to state that if a selected site will cause excess to the bounding $\chi/Q$ values, the COL applicant will demonstrate how the dose reference values in 10 CFR 52.79(a)(1)(vi) (instead of 10 CFR 50.34) are met using site-specific $\chi/Q$ values.

The applicable design-basis accident offsite radiological consequence criteria for COL applicants are presented in 10 CFR 52.79(a)(1)(vi), not 10 CFR 50.34.

---

**ANSWER:**

Agree with the comment, and it will be revised in the DCD Revision 2.

**Impact on DCD**

The DCD will be changed in Revision 2 to incorporate the following:

- Change the last sentence in *COL 2.3(2)* of Subsection 2.3.6 to "*If a selected site will cause excess to the bounding $\chi/Q$ values, then the COL Applicant is to demonstrate how the dose reference values in 10 CFR 52.79(a)(1)(vi) (Reference 2.3-3) and the control room dose limits in 10 CFR 50, Appendix A, General Design Criteria 19 (Reference 2.3-4) are met using site-specific $\chi/Q$ values.*"
- Change Reference 2.3-3 of Subsection 2.3.7 to "Contents of applications; technical information in final safety analysis report, Title 10, Code of Federal Regulations, Part 52.79, U.S. Nuclear Regulatory Commission, Washington, DC."

**Impact on COLA**

The COLA will be changed to incorporate the following:

- The COL Applicant is to reference 10 CFR 52.79(a)(1)(vi) opposed to 10 CFR 50.34 for dose criteria as indicated in revised DCD Subsection 2.3.4 and COL 2.3(2).

**Impact on PRA**

There is no impact on the PRA

This completes MHI's response to the NRC's question.

Enclosure 4

UAP-HF-08130
Docket No. 52-021

Response to Request for Additional Information No. 44-775
Revision 0

September, 2008

## RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

9/10/2008

**US-APWR Design Certification**

**Mitsubishi Heavy Industries**

**Docket No. 52-021**

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|---|---|
| **RAI NO.:** | **NO.44-775 REVISION 0** |
| **SRP SECTION:** | **02.03.05 – Long Term Atmospheric Dispersion Estimates for Routine Releases** |
| **APPLICATION SECTION:** | **02.03.05.02** |
| **DATE OF RAI ISSUE:** | **7/30/2008** |

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**QUESTION NO. : 02.03.05-1**

Revise the DCD to discuss in greater detail the methodology (e.g., atmospheric dispersion models, input assumptions, and meteorological data sets) used to select the annual average exclusion area boundary and food production area χ/Q and D/Q values presented as key site parameters in DCD Tier 1 Table 2.1-1 and Tier 2 Table 2.0-1. Discuss how this methodology ensures that the selected key site parameter values bound a reasonable number of sites that have been or may be considered for a COL application.

Review Procedure 6.b of SRP 2.3.5 states site parameters should be representative of a reasonable number of sites that may be considered within a COL application and a basis should be provided for each of the site parameters.

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**ANSWER:**

It is agreed to discuss the methodology, bounding of a reasonable number of sites in more detailed, and the basis for each of the site parameters.

**Impact on DCD**

The DCD will be changed in Revision 2 to incorporate the following:

- Replace the second paragraph of Subsection 2.3.5 with the following:

"The long-term χ/Q values at the US-APWR EAB are site-specific. There is no site specific meteorological data and the food production area in the stage of the DCD.

The Depleted/Undepleted/Decayed χ/Q value of EAB should be determined to envelop the most existing plant values. The US-APWR χ/Q value of EAB (0.5 miles) is selected as representative of US-plants, to be around 70% of the highest value at the corresponding EAB distance of many existing plants. This US-APWR $\chi/Q$ value of EAB envelopes most values at the corresponding EAB distance of many existing plants.

The long-term offsite $\chi/Q$ value should be determined for the food production area. The offsite $\chi/Q$ value is defined almost to envelop the $\chi/Q$ values at locations more than the EAB distance of the US-APWR.

The D/Q values should be determined in a similar way as to how to determine the $\chi/Q$ values. The US-APWR D/Q value of the offsite boundary is conservatively assumed to be equal to the D/Q value of EAB. Therefore, the D/Q values of EAB are determined to envelop most values of some existing plants.

Therefore, it is ensured that the $\chi/Q$ values and the D/Q values of the US-APWR bound a reasonable number of existing plant values. The COL Applicant is to characterize the atmospheric transport and diffusion conditions necessary for estimating radiological consequences of the routine release of radioactive materials to the atmosphere, and provide realistic estimates of annual average $\chi/Q$ values and D/Q values as described in SRP 2.3.5 (Reference 2.3-5)."

**Impact on COLA**

There is no impact on the COLA

**Impact on PRA**

There is no impact on the PRA

This completes MHI's response to the NRC's question.