MITSUBISHI HEAVY INDUSTRIES, LTD.
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TOKYO, JAPAN

February 15, 2012

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

Attention: Mr. Jeffrey A. Ciocco

Docket No. 52-021
MHI Ref: UAP-HF-12033

Subject: Amended MHI's Response to US-APWR DCD RAI No. 388-2858 Revision 0 (SRP 08.03.02)

Reference: 1) "Request for Additional Information No. 388-2858 Revision 0, SRP Section: 08.03.02 DC Power Systems (Onsite), Application Section: 8.3.2," dated (June, 11, 2009).
2) "MHI's Response to US-APWR DCD RAI No. 388-2858 Revision 0" MHI Ref: UAP-HF-09375, dated July 13, 2009.
3) "Amended MHI's Response to US-APWR DCD RAI No. 388-2858 Revision 0 (SRP 08.03.02)" MHI Ref: UAP-HF-11403, dated November 22, 2011.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Amended Response to Request for Additional Information No. 388-2858 Revision 0." This amended response is submitted to address SER Open Item 08.03.02-1 and included battery sizing calculation.

Enclosed is the response to Question 08.03.02-22 that is contained within Enclosure 2.

As indicated in the enclosed materials, this document contains information that MHI considers proprietary, and therefore should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information which is privileged or confidential. A non-proprietary version of the document is also being submitted with the information identified as proprietary redacted and replaced by the designation "[ ]".

This letter includes a copy of the proprietary version (Enclosure 2), a copy of the non-proprietary version (Enclosure 3), and the Affidavit of Yoshiki Ogata (Enclosure 1) which identifies the reasons MHI respectfully requests that all materials designated as "Proprietary" in Enclosure 2 be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).

Please contact Mr. Joseph Tapia, General Manager of Licensing Department, Mitsubishi Nuclear Energy Systems, Inc. if the NRC has questions concerning any aspect of this submittals. His contact information is provided below.

D081
NRO

Sincerely,

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

Enclosures:

1. Affidavit of Yoshiki Ogata

2. Amended Response to Request for Additional Information No. 388-2858 Revision 0 (SRP 08.03.02) (Proprietary version)

3. Amended Response to Request for Additional Information No. 388-2858 Revision 0 (SRP 08.03.02) (Non-proprietary version)

CC: J. A. Ciocco
J. Tapia

Contact Information
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Enclosure 1

Docket No. 52-021
MHI Ref: UAP-HF-12033

MITSUBISHI HEAVY INDUSTRIES, LTD.

AFFIDAVIT

I, Yoshiki Ogata, state as follows:

1. I am Director, APWR Promoting Department, of Mitsubishi Heavy Industries, LTD ("MHI"), and have been delegated the function of reviewing MHI's US-APWR documentation to determine whether it contains information that should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4) as trade secrets and commercial or financial information which is privileged or confidential.

2. In accordance with my responsibilities, I have reviewed the enclosed document entitled "Amended Response to Request for Additional Information No. 388-2858 Revision 0 (SRP 08.03.02) dated February 15, 2012, and have determined that portions of the document contain proprietary information that should be withheld from public disclosure. Those pages containing proprietary information are identified with the label "Proprietary" on the top of the page and the proprietary information has been bracketed with an open and closed bracket as shown here "[ ]". The first page of the document indicates that all information identified as "Proprietary" should be withheld from public disclosure pursuant to 10 C.F.R. § 2.390 (a)(4).

3. The information identified as proprietary in the enclosed document has in the past been, and will continue to be, held in confidence by MHI and its disclosure outside the company is limited to regulatory bodies, customers and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and is always subject to suitable measures to protect it from unauthorized use or disclosure.

4. The basis for holding the referenced information confidential is that it describes the unique design methodology and analysis of Battery Sizing, developed by MHI for performing the nuclear design of the US-APWR reactor.

5. The referenced information is being furnished to the Nuclear Regulatory Commission ("NRC") in confidence and solely for the purpose of information to the NRC staff.

6. The referenced information is not available in public sources and could not be gathered readily from other publicly available information. Other than through the provisions in paragraph 3 above, MHI knows of no way the information could be lawfully acquired by organizations or individuals outside of MHI.

7. Public disclosure of the referenced information would assist competitors of MHI in their design of new nuclear power plants without incurring the costs or risks associated with the design of the subject systems. Therefore, disclosure of the information contained in the referenced document would have the following negative impacts on the competitive position of MHI in the U.S. nuclear plant market:

   A. Loss of competitive advantage due to the costs associated with development of methodology related to the analysis.

B. Loss of competitive advantage of the US-APWR created by benefits of modeling information.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information and belief.

Executed on this 15th day of February, 2012.

Y. Ogata

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

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Enclosure 3

UAP-HF-12033
Docket Number 52-021

Amended Response to Request for Additional Information
No. 388-2858 Revision 0

February 2012
(Non-Proprietary)

SUPPLEMENTAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/15/2012

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 388-2858 REVSION 0**
SRP SECTION:	**08.03.02 – DC Power Systems (Onsite)**
APPLICATION SECTION:	**08.03.02**
DATE OF RAI ISSUE:	**06/11/2009**

QUESTION NO. 08.03.02-22

In response to Question # 08.03.02-12, MHI indicated that the current requirement depended on procurement specifications. In a teleconference meeting with MHI on March 23, 2009, Staff indicated that MHI needed to explain the current requirements for loads such as load sequencer, dc solenoids, ground detector, auxiliary relays, indicating lights, etc., and confirm that all the loads listed above are included in battery load calculations. MHI provided a brief discussion on the conservatism used in sizing of the loads and the associated protection of the loads. MHI indicated that its assumptions for these types of loads were made based on Japanese experience and products. MHI agreed to provide a more in depth explanation on this issue which will be incorporated in the upcoming FSAR revisions. The staff requests that MHI docket its response confirming the above actions on part of MHI to resolve the above RAI question.

ANSWER:

The load current requirements in DCD Rev. 1 included Japanese experience and Japanese product base requirements. MHI has reconfirmed the 125V DC Class 1E Load Current Requirement of DCD Table 8.3.2-1 in consideration of US manufacturers' information and differences from the Japanese reference plant. MHI has also reviewed the basis for Japanese products and found them comparable. Where differences existed the load estimate was adjusted. Please see Attachment 1 for the basis and Attachment 2, DCD markups for the revised dc loads. Although load currents have been changed, the rating of Class 1E batteries does not require modification. Please see Attachment 3 for the battery sizing calculation.

The load current requirements of the Reactor Building DC Distribution Panel included the current requirements of the Class 1 E solenoid valves as shown in DCD Rev. 1. The load current requirements of these solenoid valves are described separately from the Reactor Building DC Distribution Panel in DCD Rev.2.

The assumed current requirements for auxiliary components (e.g., multifunctional relay) are included in each load. The explanation has been added in Table 8.3.2-1 as notes in DCD Rev.2. In addition, the load sequencer and the ground detector loads are not separately included in the dc power load because the load sequence is included in the UPS load, and the ground detector is included in auxiliary component loads.

Impact on DCD

See attached markup of DCD Table 8.3.2-1 (Attachment 2).

Impact on R-COLA

There is no impact on the R-COLA.

Impact on S-COLA

There is no impact on the S-COLA.

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical Report

There is no impact on a Technical/Topical Report.

ATTACHMENT 1 (1/1)

Description	DCD Rev.3 Load Current	Revised Load Current	Basis of Revision
Class 1E 6.9kV Switchgear	0 to 1 min ; 44 (A)	100 (A)	Revised in consideration of US manufacturer's typical values. Load current of 0 to 1 min. is current for the trip coils of all circuit breakers. Load current of 119 to 120 min. is current for the close coil of one offsite power incoming breaker.
	119 to 120 min ; 34 (A)	30 (A)	
Class 1E 480V Load Center	Normal Current ; 4 (A)	No change (Change was incorporated in DCD Rev.2.)	Revised in consideration of US manufacturer's typical values. Load current of 0 to 1 min. is current for the trip coils of all circuit breakers.
	0 to 1 min ; 24 (A)		
	1 to 119 min ; 4 (A)		
	119 to 120 min ; 4 (A)		
Class 1E GTG Exciter	Normal Current ; 1 (A)	Deleted	Excitation current for the Class 1E GTG is supplied by a permanent magnetic generator.
	0 to 1 min ; 175 (A)		
	1 to 119 min ; 0 (A)		
	119 to 120 min ; 0 (A)		
UPS unit	Normal Current ; 438 (A)	0 (A)	UPS unit normally draws AC power from 480V MCC. UPS unit only draws DC power when AC power is not available.
Battery Charger Control Circuit	0 to 1 min (A) ; 2 (A)	0 (A)	Control power for the battery charger is not supplied from the battery.
	1 to 119 min ; 2 (A)	0 (A)	
	119 to 120 min ; 2 (A)	0 (A)	
Emergency Feed Water Pump Emergency Oil Pump	Normal Current ; N/A; New	35 (A)	Emergency Feed Water Pump Emergency Oil Pump receives power from the DC power system. Rated current has been included in the battery sizing evaluation.
	0 to 1 min ; N/A; New	56 (A)	
	1 to 119 min N/A; New	35 (A)	
	119 to 120 min ; N/A; New	35 (A)	

Table 8.3.2-1 125V DC Class 1E Load Current Requirement
(Sheet 1 of 4)
Train A

Load Description	Normal Current (A)	Maximum Load Current			
		0 to 1 min (A)	1 to 119 min (A)	119 to 120 min (A)	
A Switchboard Control Circuit	2	2	2	2	
A Class 1E 6.9kV Switchgear	4	~~44~~100	4	~~34~~30	DCD_08.03.02-22
A Class 1E 480V Load Center	4	24	4	4	
A Class 1E GTG Control Board	1	5	5	5	
~~A Class 1E GTG Exciter~~	~~1~~	~~175~~	~~0~~	~~0~~	DCD_08.03.02-22
A UPS Unit	~~43~~80	438	438	438	
A&B MOV Inverter	1	1440	1	1	DCD_08.03.02-22
A Reactor Building DC Distribution Panel	11	15	11	11	
A Solenoid Valve Distribution Panel	20	20	20	20	
A Battery Charger Control Circuit	2	~~2~~0	~~2~~0	~~2~~0	DCD_08.03.02-22
A Emergency Lighting	10	10	10	10	
A MCR Radiation Monitor Pump	30	30	30	30	
A Emergency Feedwater Pump Emergency Oil Pump	35	56	35	35	DCD_08.03.02-22
Total	~~52~~4120	~~220~~52140	~~52~~7560	~~55~~7586	DCD_08.03.02-22
Random Load			For One Minute - 195	195	

Table 8.3.2-1 125V DC Class 1E Load Current Requirement
(Sheet 2 of 4)
Train B

Load Description	Normal Current (A)	Maximum Load Current			
		0 to 1 min (A)	1 to 119 min (A)	119 to 120 min (A)	
B Switchboard Control Circuit	2	2	2	2	
B Class 1E 6.9kV Switchgear	4	~~44~~100	4	~~34~~30	DCD_08.03.02-22
B Class 1E 480V Load Center	4	24	4	4	
B Class 1E GTG Control Board	1	5	5	5	
~~B Class 1E GTG Exciter~~	~~1~~	~~175~~	~~0~~	~~0~~	DCD_08.03.02-22
B UPS Unit	~~43~~80	438	438	438	
A&B MOV Inverter	1	1440	1	1	
B Reactor Building DC Distribution Panel	11	15	11	11	
B Solenoid Valve Distribution Panel	20	20	20	20	
B Battery Charger Control Circuit	2	~~2~~0	~~2~~0	~~2~~0	DCD_08.03.02-22
B Emergency Lighting	10	10	10	10	
A MCR Radiation Monitor Pump	30	30	30	30	
Total	~~52~~485	~~2205~~2084	~~527~~525	~~557~~551	DCD_08.03.02-22
Random Load			For One Minute - 195	195	

Table 8.3.2-1 125V DC Class 1E Load Current Requirement
(Sheet 3 of 4)
Train C

Load Description	Normal Current (A)	Maximum Load Current			
		0 to 1 min (A)	1 to 119 min (A)	119 to 120 min (A)	
C Switchboard Control Circuit	2	2	2	2	
C Class 1E 6.9kV Switchgear	4	~~44~~100	4	~~34~~30	DCD_08.03.02-22
C Class 1E 480V Load Center	4	24	4	4	
C Class 1E GTG Control Board	1	5	5	5	
~~C Class 1E GTG Exciter~~	~~1~~	~~175~~	~~0~~	~~0~~	DCD_08.03.02-22
C UPS Unit	~~43~~80	438	438	438	
C&D MOV Inverter	1	1440	1	1	
C Reactor Building DC Distribution Panel	11	15	11	11	
C Solenoid Valve Distribution Panel	20	20	20	20	
C Battery Charger Control Circuit	2	~~20~~	~~20~~	~~20~~	DCD_08.03.02-22
C Emergency Lighting	10	10	10	10	
B MCR Radiation Monitor Pump	30	30	30	30	
Total	~~52~~485	~~2205~~2084	~~527~~525	~~557~~551	DCD_08.03.02-22
Random Load			For One Minute - 195	195	

Table 8.3.2-1 125V DC Class 1E Load Current Requirement
(Sheet 4 of 4)
Train D

Load Description	Normal Current (A)	Maximum Load Current			
		0 to 1 min (A)	1 to 119 min (A)	119 to 120 min (A)	
D Switchboard Control Circuit	2	2	2	2	
D Class 1E 6.9kV Switchgear	4	~~44~~100	4	~~34~~30	DCD_08.03.02-22
D Class 1E 480V Load Center	4	24	4	4	
D Class 1E GTG Control Board	1	5	5	5	
~~D Class 1E GTG Exciter~~	~~1~~	~~175~~	~~0~~	~~0~~	DCD_08.03.02-22
D UPS Unit	~~43~~80	438	438	438	
C&D MOV Inverter	1	1440	1	1	
D Reactor Building DC Distribution Panel	11	15	11	11	
D Solenoid Valve Distribution Panel	20	20	20	20	
D Battery Charger Control Circuit	2	~~2~~0	~~2~~0	~~2~~0	DCD_08.03.02-22
D Emergency Lighting	10	10	10	10	
B MCR Radiation Monitor Pump	30	30	30	30	
B Emergency Feedwater Pump Emergency Oil Pump	35	56	35	35	DCD_08.03.02-22
Total	~~52~~120	~~220~~2140	~~527~~560	~~557~~586	DCD_08.03.02-22
Random Load			For One Minute - 195	195	

Notes:

1. Each Class 1E 6.9kV switchgear and 480V Load Center includes multifunction relays, auxiliary relays and indication lights for each incoming breakers and feeder breakers, and undervoltage relays.
2. Load requirement for auxiliary parts
   Multifunction relay: 0.15A
   Auxiliary relay: 0.1A
   Indication light: 0.1A
   Undervoltage relay: 0.05A
3. ~~The DC loads are preliminary and typical, and are subject to change during detailed design.~~ DCD_08.03.02-22