## MITSUBISHI HEAVY INDUSTRIES, LTD.

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TOKYO, JAPAN

September 2, 2009

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-09439

### Subject: Amended MHI's Response to US-APWR DCD RAI No.419

References: 1) "Request for Additional Information No. 419 Revision 0, SRP Section: 08.04 -Station Blackout," dated July, 6, 2009

2) "MHI's Response to US-APWR DCD RAI No.419 Revision 0, UAP-HF-09427, dated August, 21, 2009"

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.419 Revision 0."

Enclosed are the responses to one question of the RAI (Reference 1).

This response amend the previously transmitted answers submitted under MHI Reference UAP-HF-09427 on August 21, 2009 (Reference 2) in order to correct description of Impact on DCD, COLA and PRA.

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 below.

Sincerely,

4. Ogerta

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

1. Amended Response to Request for Additional Information No.419 Revision 0

CC: J. A. Ciocco C. K. Paulson

Contact Information C. Keith Paulson, Senior Technical Manager Mitsubishi Nuclear Energy Systems, Inc. 300 Oxford Drive, Suite 301 Monroeville, PA 15146 E-mail: ck\_paulson@mnes-us.com Telephone: (412) 373-6466

Docket No. 52-021 MHI Ref: UAP-HF-09439

Enclosure 1

UAP-HF-09439 Docket No. 52-021

# Amended Response to Request for Additional Information No.419 Revision 0

September 2009

#### **RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION**

9/2/2009

US-APWR Design Certification Mitsubishi Heavy Industries Docket No. 52-021 NO. 419-3126 REVISION 0

RAI NO.:	NO. 419-3126 REVISION 0
SRP SECTION:	08.04 - STATION BLACKOUT
APPLICATION SECTION:	8.4
DATE OF RAI ISSUE:	7/6/2009

#### **QUESTION NO. : 08.04-9**

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In RAI-08.04-003 the staff requested additional information and clarification on how USAPWR design met the guidance provided on SBO in the SECY 94-084 and SRP Section 8.4 for evolutionary designs. The guidance given in the SECY 94-084 recommends that the preferred method of demonstrating compliance with an SBO (10 CFR 50.63) for evolutionary designs is to have a full-capacity AAC power source of a diverse design that can power a larger complement of shutdown equipment to bring the plant to cold shutdown if needed. The description given in the US-APWR DCD (Rev 0 and Rev1) credits only one of the two AAC-GTGs to maintain the plant in hot shutdown condition during an SBO event. During the teleconference with MHI held on March 12, 2009, the staff explored the use of the second AAC-GTG during an SBO. MHI explained that USAPWR can achieve the hot shut-down condition by using only one AAC-GTG and one train Class 1 E system. Also MHI stated that the second AAC-GTG can be used as an additional back-up source to power Class 1 E system loads to achieve and to keep the plant in cold shut down condition if required.

In the original RAI the staff asked MHI to address why the Residual Heat Removal Pump was not included in the SBO loads that are powered by the AAC GTG during an SBO event. MHI indicated that the loads shown in the DCD are the loads needed for hot shut down as a minimum requirement of US-APWR under SBO conditions. MHI indicated during the March 12, 2009, teleconference that when the plant is moved to cold shut down, two AAC-GTGs will be used to operate any two safety trains' loads including the Residual Heat Removal Pump for keeping the plant in safe condition. Further, MHI agreed to add detail description to the DCD in future revision (Rev 2) on the use of both AAC-GTGs for SBO purposes. MHI will also provide load list for both Hot and Cold Shutdown conditions of the plant for an SBO event in future revision (Rev 2) of the DCD.

The staff requests that MHI docket its response confirming the above actions to resolve this RAI question.

#### ANSWER:

Description to achieve and keep cold shutdown will be added in section 8.4. Table to show loads which achieve and keep cold shutdown will be added. Impact on DCD

The last paragraph in subsection 8.4.1.3 will be revised as following:

If both AAC GTGs are running and AAC power supply from one of the AAC GTG is restored to one Class 1E bus, the other AAC GTG feeds the loads on the other non-Class 1E permanent bus. Power source which achieve and keep cold shutdown becomes available when two AACs start and the second AAC is connected to other Class 1E bus by the way which is similar to the first AAC.

Table 8.3.1-6 will be revised as Attachment A to show the load which achieve and keep Cold Shutdown during an SBO.

Impact on COLA There is no impact on the COLA.

#### Impact on PRA

There is no impact on the PRA

#### Attachment A

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#### Table 8.3.1-6 Electrical Load Distribution - AAC GTG Loading (SBO Condition)

Bus	Load	Quantity Installed	Rated Output [kW]	Load Input [kW]	Efficiency [%]	Power Factor [%]	Load Factor [%]	SBO							
								Hot Standby				Cold Shutdown			
								A or B AAC GTG			A and B AAC GTG				
								Quantity	[kW]	[kvar]	[kVA]	<u>Quantity</u>	[kW]	[kVAR]	[kVA]
Class 1E Bus	Component Cooling Water Pump	1	610	644	90	85	95	1	644	400	. 758	1	<u>644</u>	<u>400</u>	<u>758</u>
	Essential Service Water Pump	1	720	760	90	85	95	1	760	473	895	1	<u>760</u>	<u>473</u>	<u>895</u>
	Containment Spray/Residual Heat Removal Pump	1	400	422	90	85	95	0	-	-	-	1	<u>422</u>	<u>263</u>	<u>497</u>
	Charging Pump	1	820	866	90	85	95	1	866	537	1019	1	866	<u>537</u>	<u>1019</u>
	Class 1E Electrical Room Air Handling Unit Fan	1	80	89	85	80	95	1	89	68	112	1	<u>89</u>	<u>68</u>	<u>112</u>
	Essential Chiller Unit	1	290	324	85	80	95	1	324	243	405	1	324	<u>243</u>	<u>405</u>
	Class 1E Electrical Room Air Handling Unit Electrical Heater	1	250	250	100	100	100	0		•	-	Q	:	:	:
	Pressurizer Heater	1	562	562	100	100	100	0	-	-	-	Q	:	:	=
	Motor Control Center	2						2	400	249	471	2	<u>500</u>	<u>311</u>	<u>589</u>
	Subtotal								3083	1970	3660		<u>3605</u>	<u>2295</u>	<u>4275</u>
	Meter Centrel Center AAC Supporting Equipment	2						2	20 <u>80</u>	46 <u>6</u> 0	<del>25<u>10</u>0</del>	=	<u>80</u>	<u>60</u>	<u>100</u>
	Subtotal								<del>200</del>	<del>150</del>	250				
Total							_		3 <del>28<u>16</u>3</del>	2 <del>12</del> 030	3 <del>9</del> 4 <u>76</u> 0		<u>3685</u>	<u>2355</u>	<u>4375</u>