



MITSUBISHI HEAVY INDUSTRIES, LTD.

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TOKYO, JAPAN

November 26, 2008

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-08270

Subject: MHI's Responses to US-APWR DCD RAI No.87

Reference: 1) "Request for Additional Information No.87-1514 Revision 1, SRP Section: 09.05.01 – Fire Protection Program, Application Section: FSAR Section 9.5.1" dated October 28, 2008.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Responses to Request for Additional Information No.87-1514 Revision 1".

Enclosed are the responses to 4 RAIs contained within Reference 1:

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,

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

Enclosure:

1. Responses to Request for Additional Information No. 87-1514 Revision 1

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

Contact Information

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Docket No. 52-021
MHI Ref: UAP-HF-08270

Enclosure 1

UAP-HF-08270
Docket Number 52-021

Responses to Request for Additional Information No. 87-1514
Revision 1

November 2008

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

11/26/2008

**US-APWR Design Certification
Mitsubishi Heavy Industries
Docket No. 52-021**

RAI NO.: NO.87-1514 REVISION 0
SRP SECTION: 09.05.01 – Fire Protection Program
APPLICATION SECTION: FSAR Sections 9.5.1
DATE OF RAI ISSUE: 10/28/2008

QUESTION NO. : 09.05.01-14

In response to the US-APWR DCD RAI No. 30, question 09.05.01-3, MHI stated that “the effects of smoke and heat that could potentially destroy digital instrumentation and control circuits and cause multiple spurious actuations in one fire area cannot migrate to another fire area.” Describe the design features used to prevent smoke migration between fire areas containing redundant safe-shutdown trains and/or equipment. If smoke or combination fire/smoke dampers are used, confirm that the dampers are tested at full operating HVAC flow rate and pressure.

ANSWER:

The barriers that separate redundant safety trains utilize 3-hour fire rated construction with appropriately rated doors, fire dampers and penetration seals. Combination fire/smoke dampers will be used in ventilation ductwork that penetrate fire barrier walls separating redundant safety trains to prevent smoke migration into those areas containing digital instrumentation and control circuits. The combination fire/smoke dampers will be tested to operate under full operating HVAC flow rates.

Impact on DCD

See “Impact on DCD” of RAI No.30, question No.09.05.01-11.
The combination fire/smoke dampers will be included in this ITAAC.

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

11/26/2008

**US-APWR Design Certification
Mitsubishi Heavy Industries
Docket No. 52-021**

RAI NO.: NO.87-1514 REVISION 0
SRP SECTION: 09.05.01 – Fire Protection Program
APPLICATION SECTION: FSAR Sections 9.5.1
DATE OF RAI ISSUE: 10/28/2008

QUESTION NO. : 09.05.01-15

In response to the US-APWR DCD RAI No. 30, question 09.05.01-13, MHI stated that "Conformance with RG 1.189, position 4.1.7, and NFPA 804 will be demonstrated as described in COL item 9.5(1) and Table 9.5-2, including a radio system used by the fire brigade." However, as provided in Table 9.5.1-1, position 4.1.7, and Table 9.5.1-2, paragraph 8.11.1, 8.11.6 and 8.11.7, the conformance status are noted as "Conform", which infer that MHI is responsible for the installation and testing of this system. Clarify the design responsibility for the portable radio communication system provided for use by the fire brigade and other operations personnel required to achieve post-fire safe shutdown. Revise Table 9.5.1-1 and 9.5.1-2 accordingly.

ANSWER:

Conformance with RG 1.189, position 4.1.7 and NFPA 804, paragraph 8.11.1, 8.11.6 and 8.11.7 will be demonstrated as described in COL Item 9.5(1). The design responsibility for the portable radio communication system provided for use by the fire brigade and other operations personnel will be the COL Holder. MHI will revise Table 9.5.1-1, position 4.1.7 to identify "COL" in the Conformance column and to reference "COL Item 9.5(1)" in the Remarks column. Also, MHI will revise Table 9.5.1-2, paragraphs 8.11.1, 8.11.6, and 8.11.7 to identify "COL" in the Conformance column and to reference "COL Item 9.5(1)" in the Remarks column. These revisions will be made to the next revision of the DCD.

Impact on DCD

The DCD will be changed to incorporate the following:

**Table 9.5.1-1 US-APWR Fire Protection Program Conformance with RG 1.189
(Sheet 23 of 46)**

Regulatory Position	Position Number	Conformance	Remarks
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9.5.1-2

The communication system design should provide effective communication between plant personnel in all vital areas during fire conditions under maximum potential noise levels.	4.1.7	Conform <u>COL</u>	In-plant repeaters used where required. <u>COL Item 9.5(1)</u>
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**Table 9.5.1-2 US-APWR Fire Protection Program Conformance with NFPA 804
(Sheet 28 of 54)**

Standard Requirement	Paragraph	Conformance	Remarks
The plant-approved voice/alarm communications system in accordance with NFPA 72, National Fire Alarm Code, shall be available on a priority basis for fire announcements, directing the plant fire brigade, and fire evacuation announcements.	8.11.1	Conform <u>COL</u>	<u>COL Item 9.5(1)</u>

**Table 9.5.1-2 US-APWR Fire Protection Program Conformance with NFPA 804
(Sheet 29 of 54)**

Standard Requirement	Paragraph	Conformance	Remarks
Plant control equipment shall be designed so that the control equipment is not susceptible to radio frequency interferences from portable radios.	8.11.6	Conform <u>COL</u>	<u>COL Item 9.5(1)</u>
Preoperational tests and periodic testing shall demonstrate that the frequencies used for portable radio communications will not affect actuation of protective relays or other electrical components.	8.11.7	Conform <u>COL</u>	<u>COL Item 9.5(1)</u>

Impact on COLA

There are impacts on the COLA to incorporate the DCD change.

Impact on PRA

There is no impact on the PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

11/26/2008

**US-APWR Design Certification
Mitsubishi Heavy Industries
Docket No. 52-021**

RAI NO.: NO.87-1514 REVISION 0
SRP SECTION: 09.05.01 – Fire Protection Program
APPLICATION SECTION: FSAR Sections 9.5.1
DATE OF RAI ISSUE: 10/28/2008

QUESTION NO. : 09.05.01-16

In Table 9.5.1-1 of the US-APWR DCD, Rev. 1, in conformance with RG 1.189, position 1.4, MHI states that, "The US-APWR employs the use of limited applications of cable fire barriers, which have been qualified in accordance with GL 86-10, supplement 1." This shifts the design and documentation responsibility from the COL applicant to MHI. The DCD should be revised to include ITAAC per the guidance of RG 1.189, position 1.4, for cable fire barriers as appropriate.

ANSWER:

An ITAAC to verify fire barriers is included as item 15 of Table 2.2-4, Tier 1. The cable fire barrier is one type of fire barrier and an inspection of the as-built cable fire barrier will be performed if this type of fire barrier is used in the US-APWR.

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

11/26/2008

**US-APWR Design Certification
Mitsubishi Heavy Industries
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RAI NO.: NO.87-1514 REVISION 0
SRP SECTION: 09.05.01 – Fire Protection Program
APPLICATION SECTION: FSAR Sections 9.5.1
DATE OF RAI ISSUE: 10/28/2008

QUESTION NO. : 09.05.01-17

In section 9A.2.7.1 of the US-APWR DCD, Rev. 1, MHI states that "IEEE Standard 242, "IEEE Recommended Practices for Protection and Coordination of Industrial and Commercial Power systems", are applied in the design of feeder fuse and breaker coordination. This guidance is expected to be effective to prevent the multiple high-impedance faults from occurring." This statement is inaccurate as protective device coordination does not prevent multiple high impedance faults from occurring. The use of proper protective device coordination practices along with IEEE Standard 1202 cables, however, effectively eliminates the likelihood of sustained fire-induced multiple high impedance faults in branch circuits from affecting the upstream protective device. The DCD should be revised accordingly.

ANSWER:

The DCD will be revised to state, "The use of proper protective device coordination practices along with IEEE standard 1202 cables effectively eliminates the likelihood of sustained fire-induced multiple high impedance faults in branch circuits from affecting the upstream protective device."

Impact on DCD

The last two sentences of Section 9A.2.7.1 of the DCD, Rev. 1, "Multiple High-Impedance Faults," will be revised to state:

Multiple High-Impedance Faults

Multiple high impedance faults are considered in the evaluation of safe-shutdown capability. Fire induced circuit faults may occur with high enough impedance to prevent tripping the affected circuit breaker. In this plant design, Section 5.4.3.1 requirements of RG 1.189 Rev.1, which specifies to apply IEEE Standard 242, "IEEE Recommended Practices for Protection and

Coordination of Industrial and Commercial Power systems", are applied in the design of feeder fuse and breaker coordination. ~~This guidance is expected to be effective to prevent the multiple high impedance faults from occurring. Therefore, it is assumed that, if multiple high impedance faults occur simultaneously that affect currents coming from the same power source is prevented.~~
The use of proper protective device coordination practices along with IEEE standard 1202 cables effectively eliminates the likelihood of sustained fire-induced multiple high impedance faults in branch circuits from affecting the upstream protective device."

Impact on COLA

There is no impact on the COLA.

Impact on PRA

There is no impact on the PRA.