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TOKYO, JAPAN

February 20, 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-09063

Subject: MHI's Responses to US-APWR DCD RAI No.139-1533 Revision 1

References: 1) "Request for Additional Information No. 139-1533 Revision 1, SRP Section: 09.05.02 – Communications Systems, Application Section: 9.5.2," dated January 9, 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.139-1533 Revision 1."

Enclosed are the responses to 5 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 submittal. His contact information is below.

Sincerely,



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

Enclosure:

1. Responses to Request for Additional Information No.139- Revision 1

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

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Docket No. 52-021
MHI Ref: UAP-HF-09063

Enclosure 1

UAP-HF-09063
Docket Number 52-021

Responses to Request for Additional Information
No.139-1533 Revision 1

February 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/20/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No.52-021

RAI NO.: NO.139-1533 REVISION 1
SRP SECTION: 09.05.02 – Communications Systems
APPLICATION SECTION: 9.5.2
DATE OF RAI ISSUE: 1/9/2009

QUESTION NO. : 09.05.02-6

US-APWR Design Certification Final Safety Analysis Report Sections 9.5.2 and 13.6 neither reference nor discuss 10 CFR 73.45(e)(2)(iii). Only COL Item, COL 9.5(7), mentions this requirement. Is the intent to address the communication subsystems in this COL item? Also, identify how this requirement is to be referenced in Section 9.5.2.

ANSWER:

Reference to 10CFR73.45(e)(2)(iii) will be added to the DCD in the next revision of the DCD. This requirement is presently addressed in COL item COL 9.5(4).

Impact on DCD

Reference to 10CFR73.45(e)(2)(iii) will be added to the DCD section 9.5.2 as follows, (Attachment-1):

“Some parts of the facility communication systems, related functions and external interfaces are the responsibility of the licensee and are addressed by the COL applicant. These items include the communications aspects of the licensee’s security and detection systems (**10 CFR 73.45(e)(2)(iii)**), the emergency response center (10 CFR 50.34(f)(2) and 10 CFR 50.47(a)(8)), the technical support center, the emergency plan (10 CFR 50 Appendix E) and fire response plans (10 CFR 50, Appendix A, GDC 3) (Ref. 9.5.2-1, 2, 3 and 4).”

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/20/2009

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

RAI NO.: NO.139-1533 REVISION 1
SRP SECTION: 09.05.02 – Communications Systems
APPLICATION SECTION: 9.5.2
DATE OF RAI ISSUE: 1/9/2009

QUESTION NO. : 09.05.02-7

Do the respiratory protective devices to be used with the communication equipment comply with NUREG-0654/FEMA-REP-1, Rev. 1, Section II.E.7? If not, what guidance is followed?

ANSWER:

Reference to Regulatory Guide 8.15, Acceptable Programs for Respiratory Protection and EPRI NP-6559, Voice Communications Systems Compatible with Respiratory Protection will be added to the DCD the next revision of the DCD. This is the guidance that will be followed. This item is presently addressed in existing COL item COL 9.5(3).

Impact on DCD

In DCD Section 9.5.2.2.4.2, add sentence to end of last paragraph as follows (Attachemnt-2, 3):

“Radio communications equipment used in conjunction with respiratory protective equipment will comply with the requirements delineated in Reg. Guide 8.15 (Ref. 9.5.2-30) and the guidance provided in EPRI NP-6559 (Ref.9.5.2-6).”

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/20/2009

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

RAI NO.: NO.139-1533 REVISION 1
SRP SECTION: 09.05.02 – Communications Systems
APPLICATION SECTION: 9.5.2
DATE OF RAI ISSUE: 1/9/2009

QUESTION NO. : 09.05.02-8

US-APWR Design Certification Final Safety Analysis Report Section 9.5.2.4 states that "The analysis, design, fabrication, erection, inspection, testing and verification of the plant communication systems is performed in accordance with the codes and standards specified in Subsection 9.5.10." Subsection 9.5.10 is a list of references with many of the references not cited in the text. For example, 10CFR Part 50, is referenced but is the intent to meet the requirements of 10 CFR 50.55a? Also, this section lists IE Bulletin 80-15 as a reference but it is unclear if this Bulletin is complied with and to what extent. The DCD should address the references in Subsection 9.5.10 for guidance or compliance within the text.

ANSWER:

The referenced codes and standards applicable to communications systems are shown in DCD section 9.5.2.1.3 and are partially listed in section 9.5.10. Section 9.5.10 is a list of references for the entire Chapter 9. The sentence in the DCD will be revised to reference 9.5.2.1.3. In the context these standards are listed, that is applicable design standards, no further clarification is needed.

Impact on DCD

The first sentence of DCD subsection 9.5.2.4 will be revised as follows (Attachment-4):

"The analysis, design, fabrication, erection, inspection, testing and verification of the plant communication systems is performed in accordance with the codes and standards specified in Subsection ~~9.5.10~~**9.5.2.1.3**"

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/20/2009

**US-APWR Design Certification
Mitsubishi Heavy Industries
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RAI NO.: NO.139-1533 REVISION 1
SRP SECTION: 09.05.02 – Communications Systems
APPLICATION SECTION: 9.5.2
DATE OF RAI ISSUE: 1/9/2009

QUESTION NO. : 09.05.02-9

Passive and active repeaters are distributed throughout the plant to ensure complete coverage anywhere in the facility. In accordance with Regulatory Guide 1.189, the repeaters should be protected from exposure to fire damage. Address the protection of repeaters from fire damage and the compliance with Regulatory Guide 1.189 overall.

ANSWER:

Enclosures for radio repeaters will be suitably designed to meet the fire resistance guidance provided in Reg. Guide 1.189. Section 9.5.2.2.4.1 of the DCD will be revised to reflect this in the next DCD revision.

Impact on DCD

Subsection 9.5.2.2.4.1 of the DCD will be revised as follows (Attachment-5):

“The plant radio system provides normal and emergency communications capability independent of the PA/PL, PABX and SPTS. The system consists of a base controller with antenna and individual hand held radio units. Passive and active repeaters are distributed throughout the plant to ensure complete coverage anywhere in the facility. **Repeaters are installed in suitable fire resistant enclosures to protect them from exposure to fire, smoke, water and dust.**”

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

2/20/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No.52-021

RAI NO.: NO.139-1533 REVISION 1
SRP SECTION: 09.05.02 – Communications Systems
APPLICATION SECTION: 9.5.2
DATE OF RAI ISSUE: 1/9/2009

QUESTION NO. : 09.05.02-10

US-APWR Design Certification Final Safety Analysis Report Section 9.5.2, Communication Systems, 2nd paragraph states, "These items include the communications aspects of the licensee's security and detection systems, the emergency response center (10 CFR 50.34(f)(2) and 10 CFR 50.47(a)(8))...." Confirm that the reference to 10 CFR 50.47(a)(8) should be to 10 CFR 50.47(b)(8).

ANSWER:

This is a typographical error. The DCD shall be revised to reflect the proper reference to 10CFR50.47(b)(8) in the next revision of the DCD

Impact on DCD

Section 9.5.2 of the DCD will be revised as follows (Attachment-1):

"These items include the communications aspects of the licensee's security and detection systems, the emergency response center (10 CFR 50.34(f)(2) and 10 CFR 50.47**(b)(8)**), the technical support center, the emergency plan (10 CFR 50 Appendix E) and fire response plans (10 CFR 50, Appendix A, GDC 3) (Ref. 9.5.2-1, 2, 3 and 4)."

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

9. AUXILIARY SYSTEMS**US-APWR Design Control Document**

Pressure sensors start the fire pumps on decreasing fire main water pressure. Pressure indicators confirm adequate pressures for automatic and manual suppression systems, and selected pressure sensors monitor air pressure in fire suppression piping.

Valve position sensors are used to monitor the position of water supply valves (i.e., serve a supervisory function).

The fire water storage tank is monitored for level and temperature. The diesel-driven fire pump fuel storage tank, if a diesel driven fire pump is used, is monitored for level.

The run status of the fire pumps are indicated on the display in MCR.

9.5.2 Communication Systems

The communication systems provide for effective intra-plant and plant-to-offsite communications during normal, transient, fire, accidents, off-normal phenomena (e.g., LOOP), and security-related events. The various plant communication systems provide independent, alternate, redundant communication paths to ensure the ability to communicate with station and offsite agencies during all operating conditions.

Some parts of the facility communication systems, related functions and external interfaces are the responsibility of the licensee and are addressed by the COL applicant. These items include the communications aspects of the licensee's security and detection systems (10 CFR 73.45(e)(2)(iii)), the emergency response center (10 CFR 50.34(f)(2) and 10 CFR 50.47(a)(8)), the technical support center, the emergency plan (10 CFR 50 Appendix E) and fire response plans (10 CFR 50, Appendix A, GDC 3) (Ref. 9.5.2-1, 2, 3 and 4).

The plant's communication systems are not safety-related in that they are not needed to mitigate the consequences of a design basis accident. However, they are important to safety in that they are needed to operate the facility and to provide security for the plant; by enabling each guard, watchman, or armed response individual on duty to maintain continuous communication with security forces and with appropriate agencies (10 CFR 73.55(e) and (f) (Ref. 9.5.2-5). Security communications are discussed in Section 13.6.

9.5.2.1 Design Basis

The principal design criteria in 10 CFR 50, Appendix A, establish the necessary design basis, fabrication, construction, testing, and performance requirements for the US-APWR safety-related structures, systems and components. Adherence to the concepts inherent in these criteria, as they pertain to communication systems, provides reasonable assurance that the facility can be operated without undue risk to the health and safety of the public. The communication systems adhere to the guidance provided in 10 CFR 50, Appendix A, GDC 1, 2, 3, 4, and 19 (Ref. 9.5.2-4).

The communication systems components are qualified to operate in all plant environments. Depending on the specific installed plant location, the selected components are qualified operate in the following environments, as applicable:

9. AUXILIARY SYSTEMS**US-APWR Design Control Document**

The radios are equipped with tone-coded squelch capability to ensure that a message cannot be received unless the message contains the proper address code.

Radio communications equipment used in conjunction with respiratory protective equipment will comply with the requirements delineated in Reg. Guide 8.15 (Ref. 9.5.2-30) and the guidance provided in EPRI NP-6559 (Ref.9.5.2-6)

9.5.2.2.4.3 Power Source

The non-Class 1E UPS system provides power for the base station and consoles. Portable, hand-held radios have internal, exchangeable, rechargeable batteries. Non-portable communications equipment remains operable from independent power sources in the event of loss of normal power modes.

9.5.2.2.5 Offsite Communication Systems**9.5.2.2.5.1 General**

Plant offsite communications arrangements are site-specific and are described by the COL applicant. The plant will be provided with multiple offsite communications links such as microwave, hardwired (copper), broadband (cable), fiber optic and direct satellite. These links will include both verbal and data communications. A firewall system is provided to protect the plant broadband systems. The use of these alternate links provides access to the nationwide telephone system. They allow the plant to operate and meet regulatory requirements.

9.5.2.2.5.2 Emergency Communications

Effective emergency onsite and plant-to-offsite communications is provided by the onsite PABX and the offsite emergency response center PABX systems. These systems allow for communications during normal as well as off normal situations including design basis accidents, fire, and LOOP.

The offsite communication system is located in the offsite emergency response center identified in 10 CFR 50.47 (b)(8). It is described by the COL applicant. The effectiveness of the over all Emergency Response Plan pursuant to 10 CFR 50.47 (b)(8) (Ref. 9.5.2-2) is addressed by the COL applicant.

The PA/PL, PABX, and plant radio systems are normally used for intra-plant normal and emergency communications with the SPTS providing additional capability and backup.

Radiation and fire alarms have priority over page. When the page system receives alarm inputs from the fire or radiation panels, it automatically provides audible messages and tone annunciation in accordance with specified schedules.

The following radio systems provide both in-plant and plant-to-offsite emergency communications:

9. AUXILIARY SYSTEMS

US-APWR Design Control Document

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- 9.5.2-25 Guidelines for Fire Protection for Nuclear Power Plants, BTP SPLB 9.5-1.
- 9.5.2-26 Radio Frequency Devices, Title 47, Code of Federal Regulations (Federal Communications Commission), Part 15.
- 9.5.2-27 Possible Loss of Emergency Notification System (ENS) with Loss of Offsite Power, US NRC IE Bulletin 80-15.
- 9.5.2-28 Fixed site physical protection systems, subsystems, components, and procedures, NRC Regulations Title 10, Code of Federal Regulations, 10CFR Part 73.46.
- 9.5.2-29 Performance Capabilities of Fixed Site Physical Protection Systems – Communications Subsystems, NRC Regulations Title 10, Code of Federal Regulations, 10CFR Part 73.45.
- 9.5.2-30 Acceptable Programs for Respiratory Protection, Regulatory Guide 8.15 Revision 1, October 1999.
- 9.5.3-1 IESNA Lighting Handbook, Illuminating Engineering Society of North America (IESNA), 9th Edition.
- 9.5.3-2 U.S. Nuclear Regulatory Commission, Human-System Interface Design Review Guidelines, NUREG-0700 Revision 2, May 2002.
- 9.5.4-1 Qualification and Test Plan of Class 1E Gas Turbine Generator System, MUAP-07024-P (Proprietary) and MUAP-07024-NP (Non-Proprietary) December, 2007.
- 9.5.4-2 Fuel Oil Systems for Standby Diesel-Generators, ANSI N195, 1976.
- 9.5.4-3 Quality Group Classifications and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants, Regulatory Guide 1.26 Revision 4, March 2007.
- 9.5.4-4 Seismic Design Classification, Regulatory Guide 1.29 Revision 4, March 2007.
- 9.5.4-5 Fuel Oil Systems for Standby Diesel Generators, Regulatory Guide 1.137 Revision 1, October 1979.
- 9.5.4-6 Fuel Oil Systems for Safety-Related Emergency Diesel Generators, ANSI/ANS-59.51, 1997.
- 9.5.4-7 Rules for Construction of Nuclear Power Plant Components, ASME Boiler & Pressure Vessel Code, Section III, 2004.
- 9.5.4-8 Welded Steel Tanks for Oil Storage, API 650 Revision 11, 2007.
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9. AUXILIARY SYSTEMS**US-APWR Design Control Document**

- Crisis management radio systems in accordance with the intent of NUREG-0654 (Ref. 9.5.2-24)
- Fire brigade radio system, in accordance with BTP SPLB 9.5-1, position C.5.g(4) (Ref. 9.5.2-25)

The emergency offsite communication system, including the crisis management radio system, is addressed by the COL applicant. The fire brigade radio system is site-specific, consisting of a base unit, mobile units, and portable units, also is addressed by the COL applicant.

9.5.2.3 Safety Evaluation

Plant communication systems are not required to mitigate a DBA, however they are important to safety. These systems are needed to support effective normal and off-normal operations as well as to coordinate on-site and off-site responses during abnormal or emergency events. The off-site communications systems within the one-site operations support center provide for emergency response following a design basis accident. Redundant communication paths and technologies are employed to minimize the possibility of complete loss of on-site and off-site communications.

9.5.2.4 Inspection and Testing Requirements

The analysis, design, fabrication, erection, inspection, testing and verification of the plant communication systems is performed in accordance with the codes and standards specified in Subsection 9.5.109.5.2.1.3.

Test procedures are prepared, performed, and recorded in accordance with the requirement of 10 CFR 50, Appendix A (Ref. 9.5.2-4). Inspection, calibration, and testing of sound levels for plant areas is based upon the area's environmental conditions.

Each system will be verified to be in conformance with 47 CFR (FCC) 15 Class A for radio frequency interference emission compliance (Ref. 9.5.2-26). The sound power system's units will be individually tested, channel by channel, in the associated environment for sound quality and applicable operating functions. The PA/PL (including evacuation, fire, and radiation alarms), sound quality and ranges are tested throughout the plant to verify satisfactory operations. Loss of ac power tests are performed to verify functionality of the systems by standby power and battery power sources.

Individual test of communications among the control room, TSC, EOF, principal state and local emergency operations centers and radiological field assessment teams are performed. This is in conformance to the requirements of 10 CFR 50.47 (b)(6).

9.5.2.5 Instrumentation Requirements

No special instrumentation is required. The systems use high grade industrial components and are redundantly configured to assure continuous communications capability both on-site and off-site.

9. AUXILIARY SYSTEMS**US-APWR Design Control Document**

- g) Electrical and mechanical equipment areas
- h) Other high maintenance activity areas (e.g. equipment hatch)
- i) Security facilities

Simultaneous communication capability is provided by the SPTS between the MCR and all of these plant stations. The SPTS provides a backup communications mechanism during all modes of plant operations. Portable handsets are provided with sufficient cable (and extensions) to allow personnel to use the system at any point within the plant, if needed.

9.5.2.2.4 Plant Radio System**9.5.2.2.4.1 General**

The plant radio system provides normal and emergency communications capability independent of the PA/PL, PABX and SPTS. The system consists of a base controller with antenna and individual hand held radio units. Passive and active repeaters are distributed throughout the plant to ensure complete coverage anywhere in the facility. Repeaters are installed in suitable fire resistant enclosures to protect them from exposure to fire, smoke, water and dust.

9.5.2.2.4.2 Operation

Low power portable radios are used with the system to reduce radio frequency interference with control and instrument circuits. The system is designed to permit radio to radio and radio to MCR communications from any location within the facility. Communication consoles are located at select plant locations including the MCR, TSC and remote shutdown consoles.

The radios are equipped with multiple channels typically assigned as follows:

- Emergency (alternate security)
- Fire brigade (alternate security)
- Operations
- Maintenance (alternate operations)
- Management
- Health physics
- Additional channels are assigned by the plant operator as necessary for select plant locations