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TOKYO, JAPAN

November 12, 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-08262

Subject: MHI's Responses to US-APWR DCD RAI No. 85-1145 Revision 0

References: 1) "Request for Additional Information No. 45-1145 Revision 0, SRP Section: 6.2.2 – Containment Heat Removal System – Design Certification and New License Applicants, Application Section: 6.2.2," dated October 16, 2008.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Response to Request for Additional Information No. 85-1145 Revision 0".

Enclosure 1 provides the responses to the 2 questions that are 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,

Y. Ogata

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

1. Responses to Request for Additional Information No. 85-1145 Revision 0

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

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NRO

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Docket No. 52-021
MHI Ref: UAP-HF-08262

Enclosure 1

UAP-HF-08262
Docket No. 52-021

Responses to Request for Additional Information
No. 85-1145 Revision 0

November 2008

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

11/12/2008

US-APWR Design Certification

Mitsubishi Heavy Industries, Ltd.

Docket No. 52-021

RAI NO.: NO. 85-1145 REVISION 0

SRP SECTION: 6.2.2 – Containment Heat Removal System

APPLICATION SECTION: 6.2.2

DATE OF RAI ISSUE: 10/16/2008

QUESTION NO.: 06.02.02-10

The response to RAI 45-876 Question No. 06.02.02-1 (Reference 1) indicated that only DBA-qualified epoxy coatings will be used inside the US-APWR primary containment, and that the discussion of the potential use of zinc primer in DCD Subsection 6.1.2, was incorrect.

The proposed change to DCD Subsection 6.1-2 on p. 6.15, 1st paragraph, eliminates the words "(e.g. inorganic zinc)".

Requested Information:

a) Identify the type of corrosion inhibiting primer that will be used.
b) Does the type of corrosion inhibiting primer to be used contain metals that could contribute to chemical effects?
c) Does the corrosion inhibiting primer need to be represented in the chemical test?
d) Discuss the experience with the use of corrosion inhibiting primers that do not contain metals in PWR plants.
e) Since the DCD specifies that all coatings inside containment will be DBA qualified, what recommendations can MHI make to the COL applicants to ensure that vendor-supplied components, such as pump and valve bodies, actuators, etc. are supplied with DBA-qualified coatings? Should the possibility of a certain amount of unqualified coatings be accounted for in the chemical effects testing or the head loss evaluation, since it may be difficult for the COL holders to procure all components with DBA-qualified coatings?

Reference

1. Letter from Yoshiki Ogata, MHI, to Jeffrey Ciocco, USNRC dated August 26, 2008; Subject: MHI's Response to US-APWR DCD RAI No. 45-876 Docket No. 52-021 MHI Ref: AP-HF-08152; ADAMS Accession No. ML082470054

ANSWER:

a) The standard US-APWR utilizes epoxy type primer, and no zinc rich paint is used inside containment. The zinc rich primer paint had been used for Mitsubishi PWR plants that have constructed relatively old generation in Japan, but it was not used for late plants. In fact, for latest Mitsubishi PWR that has almost been constructed in Japan, MHI applies epoxy primer and epoxy top-coated paint for steel liner of the containment and structural steel supports members inside containment.
b) The primer does not contain metals that contribute to chemical effects.
c) No specimens of corrosion inhibiting (metallic) primer were included in the chemical effect tests.
d) As stated in the above a), MHI has applied epoxy primer and epoxy top-coated paint for steel liner of the containment and structural steel supports members inside containment for recent Mitsubishi PWR in Japan.
e) If COL applicant cannot procure components with qualified coatings from supplier, it is recommended that the components shall be procured without coating and apply a qualified coating system, or remove the unqualified coating and repaint with a qualified coating system.

Impact on DCD

This revision impacts revision 2 of the DCD in the first paragraph of Subsection 6.1.2, on page 6.1-5, with the following corrections:

With the notable exception of coatings and electrical insulation, organic materials (e.g., wood, plastics, lubricants, asphalt) are not freely available in containment. A ~~corrosion-inhibiting~~ primer **(e.g., epoxy)** typically is applied as a base coating over the steel plate lining of the containment vessel, as well as to structural steel support members.

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

11/12/2008

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.: NO. 85-1145 REVISION 0

SRP SECTION: 6.2.2 – Containment Heat Removal System

APPLICATION SECTION: 6.2.2

DATE OF RAI ISSUE: 10/16/2008

QUESTION NO.: 06.02.02-11

The response to RAI 45-876 Question No. 06.02.02-4 (Reference 1) stated that the environmental test conditions are selected to maximize the corrosion products generated (released) for the mission time, not necessarily the precipitates which are a function of equilibrium concentration and solubility. The response also stated that (the applicant agrees) that lower temperatures can produce precipitates and these lower temperatures can be realized through the sampling process (cooling) to identify precipitates. However, the purpose of the experiment is to produce a conservative release of corrosion products into the recirculation fluid, and this is achieved through a higher temperature profile in the experiment.
The response indicates the lower temperatures that are more likely to result in formation of precipitates will be realized through the sampling process (cooling) to identify precipitates.

Requested Information:

a) How will the amount of precipitate expected to form in the US-APWR sump be predicted from the chemical effects test? For example, will the prediction be based on physical observation and measurement of precipitates or on the maximum amount of precipitate that could form from the dissolved chemical species (corrosion products)?

b) If the prediction is based on the dissolved chemical species, describe the methodology used to determine the amount of precipitates expected, such as an algorithm or computer program.

References

1. Letter from Yoshiki Ogata, MHI, to Jeffrey Ciocco, USNRC dated August 26, 2008; Subject: MHI's Response to US-APWR DCD RAI No. 45-876 Docket No. 52-021 MHI Ref: UAP-HF-08152; ADAMS Accession No. ML082470054

ANSWER:

The chemical effects test is conducted to produce a conservative release of corrosion products into the recirculation fluid. The sample fluid is examined to identify the concentration of each dissolved element, without filtering or cooling to produce the precipitants.

Amount of chemical precipitants will be quantitatively predicted by commercial chemical equilibrium analyzer (i.e., OLI StreamAnalyzerTM code) using chemical concentration analysis results in the sample fluid of the tests. Since the representative chemical precipitants impacts on head loss evaluation have already been identified by PWROG investment (Reference-1), the prediction will be made to account for followings:

Aluminum Hydroxide	:ALOOH
Sodium Aluminum Silicate	:$NaALSi_3O_8$
Calcium Phosphate	:$Ca_3(PO_4)_2$

Reference

1. PWROG TR-WCAP-16530-NP, " Evaluation of Post-Accident Chemical Effects in Containment Sump Fluids to Support GSI-191"

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.