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July 18, 2007

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

Attention: Mr. David B. Matthews

Project No.0751

**Subject: Proposed Plan of the Contents of Design Control Document for the US-APWR**

In the pre-application review meeting of the US-APWR held on June 13, 2007, Mitsubishi Heavy Industries, Ltd. (MHI) presented the contents of the Design Control Document (DCD) which MHI plans to submit to the NRC in December, 2007 for Design Certification of the US-APWR. Prior to the DCD submittal, MHI has been submitting topical reports to the NRC as a part of the DCD pre-application activities. In this meeting, MHI presented the design time-line for the submittal of additional US-APWR standard design information, and committed to dates when these technical reports will be submitted, or when associated design information will be available for the NRC staff's audit.

The purpose of this letter is to outline the proposed submittal plan for the contents of the DCD and the technical reports to be provided during the DCD review phase, taking into account the NRC staff's comments in June 13<sup>th</sup> meeting.

The proposed plan for submittal of additional technical information during the DCD review phase is outlined below, and listed in Table 1:

1. Topical reports during DCD pre-application review phase

As stated above, MHI has already submitted multiple topical reports to the NRC as a part of the DCD pre-application activities. These topical reports address specific technical topics that should facilitate the NRC's review prior to the DCD submittal to assure that the methodologies to be included in the DCD are acceptable and are in accordance with the NRC's guidance. The topical reports will be referred to in the DCD. The topical reports already submitted to the NRC include those for Quality Assurance, the Advanced Accumulator, I & C, HFE, Fuel, and Thermal Hydraulic Design. In addition, the following topical reports, related to Safety analysis methodology, are scheduled to be submitted in July 2007:

- Large Break LOCA Code and Methodology Applicability
- LOCA Mass and Energy Release Code and Methodology Applicability
- Small Break LOCA Methodology
- Non-LOCA Analysis Methodology

## 2. Design Control Document

As previously indicated, the US-APWR Design Control Document (DCD) for Design Certification is scheduled to be submitted to the NRC in December 2007.

## 3. Technical reports and NRC's audits during the DCD review phase

MHI expects that the DCD for the standard design of the US-APWR will be sufficient for the NRC's review. Most of the standard design will be complete prior to the DCD submittal. However, some specific areas of the design will be completed during the early stages of the DCD review phase. Detailed design results for such areas will support the contents of the DCD, and will be submitted during the DCD review phase as technical reports, which will be incorporated by reference in a later DCD revision. The detailed design results not included in the technical reports will be made available for NRC staff audits.

The following summarizes the contents for the technical reports (which are also summarized in Table 1):

### 3.1 Structure and Containment Vessel

MHI will provide codes and standards, analysis methods, modeling techniques, stress analysis criteria, and stress analysis results summaries of the PCCV, Reactor Building and Inner Concrete in the DCD. The stress analysis results summaries of the Emergency Power Building that accommodates the gas turbine generators as emergency power sources will be submitted as a technical report in December, 2008. The stress summary for the structure of the Essential Service Water System, which is site specific, will be submitted in the COLA for facilities referencing the US-APWR design.

### 3.2 Fuel Assemblies

Design methodologies, such as the analysis method and stress analysis criteria, and most of the design evaluation results summary will be provided in the DCD. However, a part of the stress evaluations, i.e. the stress evaluations for seismic events and postulated accidents, will be submitted as a technical report in June, 2009.

### 3.3 Components

MHI will provide design methodologies such as analysis methods and stress analysis criteria in the DCD. The actual design of ASME Class 1 components is scheduled to be completed in mid-2009 at which time MHI will provide additional stress analysis summaries as technical reports. Certain Class 1 components will be chosen as representative examples and will be included in the technical reports. It is expected that the representative examples will be sufficient for the NRC to verify the design criteria and methodologies. Currently, two components, the Reactor Vessel and the Reactor Internals, have been selected as the examples considering the important technical aspects of these components, such as irradiation effects and pressure retaining and fatigue effects. The technical reports for the two components will be submitted in June, 2009.

As for ASME Class 2 and Class 3 components, the standard design will be completed

approximately in 2010, when a final Safety Evaluation Report (SER) is expected to be published. Remaining stress analysis results will be prepared and available for NRC audit prior to the final SER issuance. In addition, during the construction phase, ASME design reports as requested by the plant owner will be prepared and will be available before fabrication/procurement starts.

### 3.4 Piping

MHI plans to provide design methodologies, such as stress analysis methods and criteria and LBB evaluation methods, in the DCD. All of the ASME Class 1 and Class 2 piping design are scheduled to be complete in the middle of 2009 and in the middle of 2010, respectively. Similar to that for the components, stress analysis summaries for representative piping systems will be submitted as technical reports in June, 2009. Surge Line piping and Main Steam Line piping have been chosen as examples for Class 1 and Class 2 piping, respectively, taking into account the important technical aspects of these systems, such as fatigue effects, water hammer effects and thermal stratification effects. In addition to the stress analysis summary, LBB evaluation results for those piping systems will be included in the technical reports. Remaining stress analysis results will be prepared and available for NRC audit prior to issuance of the final SER.

Since Class 3 piping is mainly site-specific, the design needs to be verified on an as-built or as-procured basis. Therefore, the final design will be mainly verified during the plant construction phase. ASME design reports for the piping will be provided by the plant owner and will be available before the fabrication/procurement starts.

### 3.5 I&C and HFE

For the I&C design, MHI will include FSAR level design packages and detail design process for set-points, software and qualification in the DCD. Detailed design documents including set-point calculations, application software, and equipment qualification reports will be available for the NRC staff audit to close Design Acceptance Criteria prior to the fuel loading.

Regarding HFE design, FSAR level design packages and the detailed design process for plant specific HSI detail design, verification and validation (V&V), and training performance monitoring will be provided in the DCD. An additional technical report will be prepared for the US operator V&V summary in December, 2008. Detailed design documents, including display design, design of computer based procedures, and training and human performance monitoring, will be available for the NRC staff's audit to close Design Acceptance Criteria prior to the fuel loading.

### 3.6 Electric Power Design

The DCD will include FSAR level design packages and calculation methods. A technical report for the basic design, qualification plan and test plan of the Emergency Gas Turbine Generator will be submitted in November, 2007 prior to the DCD submittal. The test results of the Emergency Gas Turbine Generator will be available for the NRC staff to audit by the middle of 2009.

### 3.7 Probabilistic Risk Assessment

As discussed in the US-APWR PRA pre-application review meeting held in March, 2007, MHI will provide the results of PRA Level 1 and Level 2 in the DCD, and will provide PRA level 3 results in a technical report in March, 2008.

A summary of the technical reports MHI will submit, and submittal dates are provided below.

Table 1. Submittal plan of technical reports

Category	Technical Reports to be Referenced in the DCD	Submittal Date
SSCs	Emergency Power Building design result	Dec. 2008
	Reactor Vessel stress summary report	Jun. 2009
	Reactor Internal stress summary report	Jun. 2009
	Pzr surge line stress summary report	Jun. 2009
	MS line stress summary report	Jun. 2009
Fuel Assemblies	Fuel Assemblies design evaluation summary report for seismic and postulated accidents	Jun. 2009
Electric Power	Gas turbine generator design, qualification and test plan report	Nov. 2007
HFE	US operator V&V summary report	Dec. 2008
PRA	PRA Level 3 result	Mar. 2008

### 4. Physical Security

Since DCD Chapter 13.6, Physical Security is a sensitive item which is currently under discussion within the NRC and the NEI new plant security task force, MHI plans to follow the scope of the previously approved DCD for the initial DCD submittal in December, 2007. It is noted that the exact division between the DCD and COLAs will be a topic discussed in the US-APWR DCWG. The DCD may be amended to include additional information based on the results of the COLA DCWG discussions and activities.

Currently, MHI plans to submit additional reports related to the security for the US-APWR prior to COLA docketing to support the security program for the COLA.

With respect to the Beyond Design Basis Threat assessment for airplane crashes and associated large fires and explosions, this evaluation is under discussion within the NRC and NEI new plant security task force. MHI plans to perform the evaluation once the NRC's criteria for the evaluation are made available to MHI. Because the NRC's criteria for the evaluation are not yet available, MHI does not currently expect to file such a report at the time of the initial DCD submittal in December, 2007.

## 5. Other

### 5.1 Units and measurement system used in the DCD and reports

According to SECY-96-098 and the statement of policy at 61 FR 31169, the use of the metric system has been evaluated by the NRC. One of the outcomes of this evaluation was that English or metric units alone is permissible. Based on this finding, English units will be primarily used for the US-APWR DCD and related reports except where it is customary to express a value in metric units, such as the burn-up unit of MWd/t.

### 5.2 ASME editions used in DCD

MHI plans to use primarily ASME code 2001 edition including 2003 addenda for the design of components and piping, taking into account the requirements stipulated in 10 CFR 50.55a.

MHI believes that the proposed plan and approach described herein meets the NRC's desire to minimize the use of Design Acceptance Criteria by completing as much of the design for the US-APWR as possible during the DCD review phase. MHI requests NRC's concurrence of this plan and approach for resolving and minimizing the use of Design Acceptance Criteria for the US-APWR.

MHI will continue to communicate closely with the NRC staff to optimize the staff's review of the DCD. Dr. Paulson is the MHI contact person for the NRC. Dr. Paulson's contact information is provided below.

Sincerely,



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