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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-09424

Subject: Update of Chapter 5 and Chapter 10 of US-APWR DCD

Reference: 1) Letter MHI Ref: UAP-HF-08153 from Y. Ogata (MHI) to U.S. NRC, "Submittal of US-APWR Design Control Document Revision 1 in Support of Mitsubishi Heavy Industries, Ltd.'s Application for Design Certification of the US-APWR Standard Plant Design" dated on August 29, 2008.

MHI and Luminant have been working to resolve COL Holder Item identified in CPNPP unit 3 and 4 COLA FSAR rev.0. Currently, in CPNPP-3 and 4 COLA FSAR rev.0, COL Item 5.2(10) and COL Item 10.3(2) which require COL applicant to describe the safety valve throat area to the FSAR are COL Holder items that should be resolved at procurement stage and are not closed in the FSAR. As part of the activity, MHI decided these COL Items regarding the throat area will be deleted as the fundamental resolution to the COL Items, because the throat areas of the safety valves are not used in the safety analysis.

In addition, at the previous DCWG Meeting regarding US-APWR COL Holder Items on July 16, 2009, the above deletion was informed to NRC.

With this letter, MHI transmits to the NRC Staff the proposed updates to be made to the DCD. These updates will be incorporated into future DCD revision.

Please contact Dr. C. Keith Paulson, Senior Technical Manager, Mitsubishi Nuclear Energy Systems, Inc. if NRC has questions concerning any aspect of this letter. His contact information is provided below.

Sincerely,

Y. Ogata

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

Enclosure:

1. Update of Chapter 5 and Chapter 10 of US-APWR DCD

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CC: J. A. Ciocco
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Enclosure 1

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Update of Chapter 5 and Chapter 10 of US-APWR DCD

August 2009

Initially, MHI described valve throat area of pressurizer safety valves, CS/RHR pump suction relief valves and main steam safety valves in accordance with the requirement of R.G 1.206, C.I.5.2.2 overpressure protection in DCD Subsection 5.2.2.4 6th paragraph and DCD Subsection 10.3.2.3.2 7th paragraph as COL items shown below;

COL 5.2(10) Safety and relief valve information
The COL applicant addresses the actual throat area of the pressurizer safety valves and the CS/RHR pump suction relief valves.

COL 10.3(2) Safety and relief valve information
The Combined License Applicant is to address the actual throat area of the MSSV.

Current CPNPP unit 3 and 4 COLA FSAR states that the resolution of these COLA item is to determine the actual throat area for these valves at the procurement stage, therefore, the COL items are not closed in the FSAR. However, throat areas of these valves are not used in safety analysis and the valve set pressures and relief capacities only are used in the analysis. This information of the set pressures and capacities are shown in the following tables in the DCD;

Pressurizer safety vale: Table 5.2.2-1
CS/RHR suction relief valve: Table 5.2.2-2
Main steam safety valve: Table 10.3.2-2

Therefore, the COL items will be deleted from the US-APWR DCD. Table 1 shows the change list of Chapters 5 and 10 of the DCD to delete these COL items, which gives the positions, the contents and the reasons of the changes. Mark-up drafts of the DCD are also attached in this document.

At the previous DCWG regarding US-APWR COL items on May 16, 2009, it was informed to NRC that COL 5.2(10) and COL 10.3(2) which require COL applicant to describe the safety valve throat area to the FSAR were to be deleted from US-APWR DCD.

Table 1 Change List of Chapter 5 and Chapter 10 of DCD

Location (e.g., subsection with paragraph/sentence/item, table with column/row, or figure)	**Description of Change**
Subsection 5.2.2.4, COL 5.2(10)	Delete 6th paragraph "The COL applicant addresses the actual throat area of the pressurizer safety valves and the CS/RHR pump suction relief valves."
Subsection 5.2.6, 10th paragraph	Delete "COL 5.2(10) Safety and relief valve information The COL applicant addresses the actual throat area of the pressurizer safety valves and the CS/RHR pump suction relief valves."
Subsection 10.3.2.3.2, 7th paragraph	Delete 7th paragraph "The COL applicant is to address the actual throat area of the MSSVs."
Subsection 10.3.7, COL 10.3(2)	Delete "COL 10.3(2) Safety and relief valve information The Combined License Applicant is to address the actual throat area of the MSSV."

5.2.2.3 Piping and Instrumentation Diagrams

Overpressure protection for the RCS is provided by the pressurizer safety valves shown on Figure 5.1-2, RCS Piping & Instrumentation Diagrams, in Subsection 5.1.2. The discharge line of these valves is connected to the pressurizer relief tank (PRT) inside the containment vessel.

The CS/RHR pump suction relief valves, provided for low temperature RCPB overpressure protection, are addressed in Subsection 5.4.7, and are shown on the RHRS piping and instrumentation diagrams.

5.2.2.4 Equipment and Component Description

The pressure relief system consists of the following design features:

Four pressurizer safety valves are installed on separate relief lines at the top of the pressurizer. The pressurizer safety valves prevent exceeding 110% of the system design pressure. The pressurizer safety valves are spring loaded, self actuated with backpressure compensation. The set pressure of the safety valves is the same as the design pressure of the system. The total capacity of the valves is equal to or greater than the maximum surge rate resulting from complete loss of load with only main steam safety valves. To reduce the problem of leakage through a closed valve, a water seal is formed at the inlet side of the safety valve. The temperature detector at the outlet side of the safety valve alerts the operator to the leakage or valve lifting.

One relief valve is installed in each of the four CS/RHR pump suction lines to provide low temperature overpressure protection for RCS components when the RHRS is aligned to the RCS to provide decay heat removal during plant shutdown and startup operations. The relief valves on the RHR have an accumulation of 10% of the set pressure. The set pressure is at the lower bound of the reactor vessel low temperature pressure limit.

Open and closed indication of each safety valve or relief valve is provided in accordance with the recommendations of TMI action plan item II.D.3 in 10 CFR 50.34(f) (2)(xi) (Ref. 5.2-2).

The design parameters of the pressurizer safety valves and CS/RHR pump suction relief valves are shown in Table 5.2.2-1 and Table 5.2.2-2.

~~The COL applicant addresses the actual throat area of the pressurizer safety valves and the CS/RHR pump suction relief valves.~~

5.2.2.5 Mounting of Pressure Relief Devices

The mounting of the pressurizer safety valves are shown in Figure 5.2.2-1.

The design basis for the assumed loads for the primary and secondary side pressure relief devices are described in Subsection 3.9.3.

5.2.2.6 Applicable Codes and Classification

5.2.6 Combined License Information

COL 5.2(1) *ASME Code Cases that are approved in Regulatory Guide 1.84*

The COL applicant addresses the addition of ASME Code Cases that are approved in Regulatory Guide 1.84.

COL 5.2(2) *ASME Code Cases that are approved in Regulatory Guide 1.147*

The COL applicant addresses Code Cases invoked in connection with the inservice inspection program that are in compliance with Regulatory Guide 1.147.

COL 5.2(3) *ASME Code Cases that are approved in Regulatory Guide 1.192*

The COL applicant addresses Code cases invoked in connection with the operation and maintenance that are in compliance with Regulatory Guide 1.192.

COL 5.2(4) *Inservice inspection and testing program for the RCPB*

The COL applicant addresses and develops the inservice inspection and testing program for the RCPB, in accordance with Section XI of the ASME Code and 10 CFR 50.55a.

COL 5.2(5) *Preservice inspection and testing program for the RCPB*

The COL applicant addresses and develops the preservice inspection and testing program for the RCPB in accordance with Article NB-5280 of Section III, Division I of the ASME Code.

COL 5.2(6) *Deleted*

COL 5.2(7) *Deleted*

COL 5.2(8) *Deleted*

COL 5.2(9) *Deleted*

COL 5.2(10) *Deleted~~Safety and relief valve information~~*

~~The COL applicant addresses the actual throat area of the pressurizer safety valves and the CS/RHR pump suction relief valves.~~

exclusion zone. Section 3.6 addresses the applicability of leak before break and break exclusion zone to the main steam line. This piping is designed to Seismic Category I requirements.

Each SG outlet nozzle is equipped with a flow restrictor to limit the flow in the event of a steam line break. This flow restrictor is a multi-flow nozzle-type with a throat diameter of equivalent to16 inches.

Main steam piping is designed to minimize the effects of erosion/corrosion. Pipe material, pipe wall thickness, fluid velocity, fluid chemistry and piping arrangement affect erosion/corrosion damage.

The main steam piping to the turbine is sized to limit velocities to minimize potential erosion and routed to minimize bends/elbows. Selected pipe wall thickness includes corrosion allowance, accounting for the design life of the plant and pipe wall thickness inspections are performed to monitor wall erosion.

Design parameters for the main steam piping are provided in Table 10.3.2-1 and 10.3.2-3.

10.3.2.3.2 Main Steam Safety Valves

MSSVs with sufficient rated capacity are provided to prevent the steam pressure from exceeding 110 percent of the MSS design pressure:

The total capacity of these valves is 105% of the main steam flow rate at rated power conditions.

MSSV rated capacity is tabulated in Table 10.3.2-2.

Six MSSVs are provided per main steam line. Table 10.3.2-2 provides performance data and set pressure for the MSSVs.

The MSSVs are located in the safety-related portion of the main steam piping upstream of the MSIVs and outside the containment in the main steam/feedwater piping area. Adequate space is provided for the installation and support of the valves. Static or dynamic loads when operating or when subject to seismic events are considered.

The piping and valve arrangement and design analysis is performed in accordance with the guidelines in ASME Section III, Non-mandatory Appendix O, "Rules for Design of Safety Valve Installations." (Reference 10.3-10)

~~The COL applicant is to address the actual throat area of the MSSVs.~~

Each MSSV is connected to a vent stack. The stacks are arranged and designed to prevent steam backflow from the transition piece and to minimize the backpressure on the valve outlet.

The vent stacks are designed and supported to withstand SSE loads. This is to prevent the vent stacks from being damaged and jeopardizing the performance of safety-related

establishing fabrication tolerances. The FAC monitoring program provided by COL applicant will include preservice thickness measurements of as-built piping considered susceptible to FAC. By performing this preservice measurement, the piping thickness margin that will be used as a wall thinning margin will be known, and then by combining the measurement with regular inspection the frequency of the pipe replacement will be predicted. Integrity and safety of a plant is assured by the COL applicant by conducting inspection and maintenance during over 60 years of service and replacing piping if necessary.~~Pipe schedules/wall thicknesses are selected taking into consideration expected corrosion over the design life of the plant. Corrosion allowances meet the requirements of ASME section III (Reference 10.3-6) for safety class piping and ASME B31.1 (Reference 10.3-7) for non safety class piping.~~

The US APWR design and piping layout has considered several features for the various piping systems to minimize incidence of FAC in piping. These features include:

- elimination of high turbulence points wherever possible (example: adequate straight pipe length downstream of flow orifice or control valve, etc)
- use of long radius elbows
- smooth transition at shop or field welds
- selection of pipe diameter to have velocities within industry recommended values
- use of corrosion resistant materials
- use of austenite stainless steel and P11 and P22 chrome-moly materials

~~Piping design and layout minimizes bends and elbows. Pipe sizes are selected to have velocities within industry recommended values.~~

The type of fluid, flow rates, fluid temperatures and pressure of ASME Code Class 2 and 3 piping for steam and feedwater system are shown in Table 10.3.2-6.

The Combined License Applicant is to address preparation of an FAC monitoring program for carbon steel portions of the steam and power conversion systems that contain water or wet steam.

10.3.7 Combined License Information

COL 10.3(1) FAC monitoring program

The Combined License Applicant ~~is to address preparation~~will provide a description of athe FAC monitoring program for carbon steel portions of the steam and power conversion systems that contain water or wet steam. The description will address consistency with Generic Letter 89-08 and NSAC-202L-R2 and will provide a milestone schedule for implementation of the program.

~~*COL 10.3(2) Safety and relief valve information*~~

~~*The Combined License Applicant is to address the actual throat area of the MSSV.*~~

COL 10.3(3) Operating and maintenance procedures for water hammer prevention