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TOKYO, JAPAN

March 30, 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-09110

Subject: MHI's Responses to US-APWR DCD RAI No.252-1968

Reference: 1) "Request for Additional Information No. 252-1968 Revision 0, SRP Section: 09.02.02 – Reactor Auxiliary Cooling Water Systems, Application section:9.2.8 Turbine Component Cooling Water System," dated March 2, 2009.

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. 252-1968 Revision 0"

Enclosed is the responses to 2 RAIs contained within Reference 0.

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.

Enclosure:

1. Responses to Request for Additional Information No. 252-1968 Revision 0

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

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NRO

Docket No. 52-021
MHI Ref: UAP-HF-09110

Enclosure 1

UAP-HF-09110
Docket Number 52-021

Responses to Request for Additional Information
No. 252-1968 Revision 0

March 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

03/30/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 252-1968**
SRP SECTION:	**09.02.02 - REACTOR AUXILIARY COOLING WATER SYSTEMS**
APPLICATION SECTION:	**9.2.8 TURBINE COMPONENT COOLING WATER SYSTEM**
DATE OF RAI ISSUE:	**03/02/2009**

QUESTION NO.: 09.02.02-1

General Design Criteria (GDC) 60 requires nuclear power unit designs to include means to control the release of radioactive materials in gaseous and liquid effluents produced during normal reactor operation, including anticipated operational occurrences. Means must also be provided for monitoring effluent discharge paths and the plant environs for radioactivity that may be released in accordance with GDC 64 requirements. Additionally, 10 CFR 52.47(a)(6) and 10 CFR 20.1406 require applicants for standard plant design certifications to describe how facility design and procedures for operation will minimize contamination of the facility and the environment. In order for the staff to confirm compliance with these requirements, the design control document (DCD) needs to be revised to explain how the turbine component cooling water system satisfies the requirements specified by 10 CFR 20.1406, "Minimization of Contamination."

ANSWER:

Under normal operating conditions, there are no radioactive contaminants of operational concern present in the turbine component cooling water system (TCS). However, it is possible for the TCS to become contaminated in the event of primary to secondary system leakage. When an unacceptable radioactivity level is detected by the radiation monitors, radiation is indicated and alarmed in the Main Control Room (MCR), and adequate operating procedures are implemented. These monitors are SG blowdown water radiation monitor, Condenser Vacuum Pump Exhaust Line Radiation Monitors and Gland Seal System (GSS) Exhaust Fan Discharge Line Radiation Monitors. These monitors are discussed in DCD Subsection 11.5.2.3.5, in DCD Subsection 11.5.2.4.2, in DCD Subsection 11.5.2.4.3, respectively.

Impact on DCD

There is no impact on DCD.

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

03/30/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 252-1968**
SRP SECTION:	**09.02.02 - REACTOR AUXILIARY COOLING WATER SYSTEMS**
APPLICATION SECTION:	**9.2.8 TURBINE COMPONENT COOLING WATER SYSTEM**
DATE OF RAI ISSUE:	**03/02/2009**

QUESTION NO.: 09.02.02-2

10CFR52.47, Content of application; technical information states that "the description shall be sufficient to permit understanding of the system design and their relationship to the safety evaluation". The staff determined that the information provided in design control document (DCD) Tier 2, Section 9.2.8 is incomplete and does not fully satisfy this requirement. This information should be added to Tier 2, Section 9.2.8 or Figure 9.2.8-1.

1. The instrument air system are not shown on the flow diagram for the air operated valves for temperature controls and stand pipe makeup which are described in Tier 2, DCD Section 9.2.8.2.2.5.

2. Describe if the turbine component cooling water system (TCS) pumps required any support system such as cooling water for the seals/motors.

3. Tier 2, DCD Section 9.2.9.2.1 states that "the temperatures in the system are moderate and the fluid pressure in the system is kept higher than the above saturation conditions at all locations in the system. This along with the control of valves and other design features of the system arrangement minimizes the potential for transient water hammer." Tier 2, DCD Section 9.2.8 does not have any similar discussion on water hammer design features. Describe in detail those design features and determine if Tier 1 DCD verification is required under Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC). In addition explain how control of valves and other design features water hammer is minimized. For example, during a loss of power, and before the system is returned to service, describe the operator actions that will have to occur before the system can be started and describe if the TCS pumps auto start on low pressure during restoration from the loss of power condition.

4. Table 9.2.8-1, "TCS Component Parameters," is not noted in the Tier 2, DCD Section 9.2.8.

5. The "Note" beside the chemical addition tank on Tier 2, DCD Figure 9.1.8-1 is missing information.

6. Describe if the piping system or heat exchangers are designed for higher system flow condition where three pumps may be operating during pump swaps or heat exchanger flushing.

7. Describe if the TCS pumps received a trip signal on low standpipe level due to net positive suction head consideration.

8. Describe if a dike will be placed around the stand pipe atmospheric vent to capture any system chemical from entering the floor drain system. Normally added corrosion inhibitors should be prevented from entering any water waster systems.

9. The cooling water flow from the non essential service water system is missing from Tier 2, DCD Figure 9.1.8-1 at the TCS heat exchangers.

10. Tier 2, DCD Figure 9.1.8-1 flow lines to the loads are confusing. The flow lines appears to be touching and give the reviewer a sense that cooling supply lines and cooling return lines are interconnected.

ANSWER:

The statement that the turbine component cooling water system (TCS) has no safety-related function and therefore has no nuclear safety design basis is addressed in DCD Section 9.2.8.1.1, Safety Design Basis and DCD Section 9.2.8.3, Safety Evaluation. Therefore, MHI believes that the TCS design is not applicable to the safety evaluation. However, MHI will provide the following information to present a better understanding of the system design.

1. The instrument air system is not shown directly on the flow diagram because "air operated" can be identified by valve symbol. The valve symbol is described in DCD Figure 1.7-5. To clear the operated type, "PISTON VALVE" in Figure 1.7-5 will be changed to "AIR OPERATED PISTON VALVE", as Attachment 1.

2. No external cooling water is required for the TCS pump seals and motors.

3. Concerning the control of valves and other design features of the system arrangement that minimizes the potential for transient water hammer, a statement that a stand pipe is provided to maintain the net positive suction head for the TCS pumps is addressed in the third paragraph of DCD Subsection 9.2.8.2.1. This ensures a pressurized water solid closed loop. In addition, since a stand pipe is installed, TCS system operation can be performed as addressed in DCD Subsection 9.2.8.2.3.

   The level of detail in Tier 1 is governed by a graded approach to the SSCs of the design, based on the safety significance of the functions they perform. The TCS is non-safety related, its operating parameters are not critical to safety analyses, and the TCS is not identified as risk-significant in any PRA evaluations described in DCD Chapter 19. Therefore, MHI considers that the appropriate ITAAC and level of Tier 1 detail for the TCS is provided by the general description of the system in Subsection 2.7.3.4.

4. Table 9.2.8-1, "The TCS component parameters", is noted in the Tier 2, DCD Section 9.2.8.

   Add to the first paragraph of DCD Subsection 9.2.8.2.2 as follows:

   "The TCS component parameters are listed in Table 9.2.8-1."

5. The "Note" beside the chemical addition tank on Figure 9.2.8-1 is in error, so Figure 9.2.8-1 will be revised as Attachment 2.

6. TCS pump swaps are performed, but TCS heat exchanger flushing is not performed. The TCS piping system and heat exchanger can be operated at higher system flow conditions where three pumps may be operating during pump swaps.

7. TCS pumps do not received a trip signal on low standpipe level due to net positive suction head consideration.

8. A dike will not be placed around the stand pipe atmospheric vent, however a funnel drain for overflow is placed as shown in Figure 9.2.8-1. Fluid captured by the funnel drain is routed to the floor drain system.

9. The non-essential service water system (Non-ESW) is missing on Figure 9.2.8-1, so Figure 9.2.8-1 will be revised as Attachment 2.

10. Figure 9.2.8-1 flow lines are confusing, so Figure 9.2.8-1 will be revised as Attachment 2.

Impact on DCD

1. Figure 1.7-5 will be revised as follows:

   See Attachment 1 for mark-ups of DCD Figure 1.7-5.

4. DCD Subsection 9.2.8.2.2 will be revised as follows:

   9.2.8.2.2 Component Description

   The TCS component parameters are listed in Table 9.2.8-1.

5. Figure 9.2.8-1 will be revised as follows:

   See Attachment 2 for mark-ups of DCD Figure.9.2.8-1.

9. Figure 9.2.8-1 will be revised as follows:

   See Attachment 2 for mark-ups of DCD Figure.9.2.8-1.

10. Figure 9.2.8-1 will be revised as follows:

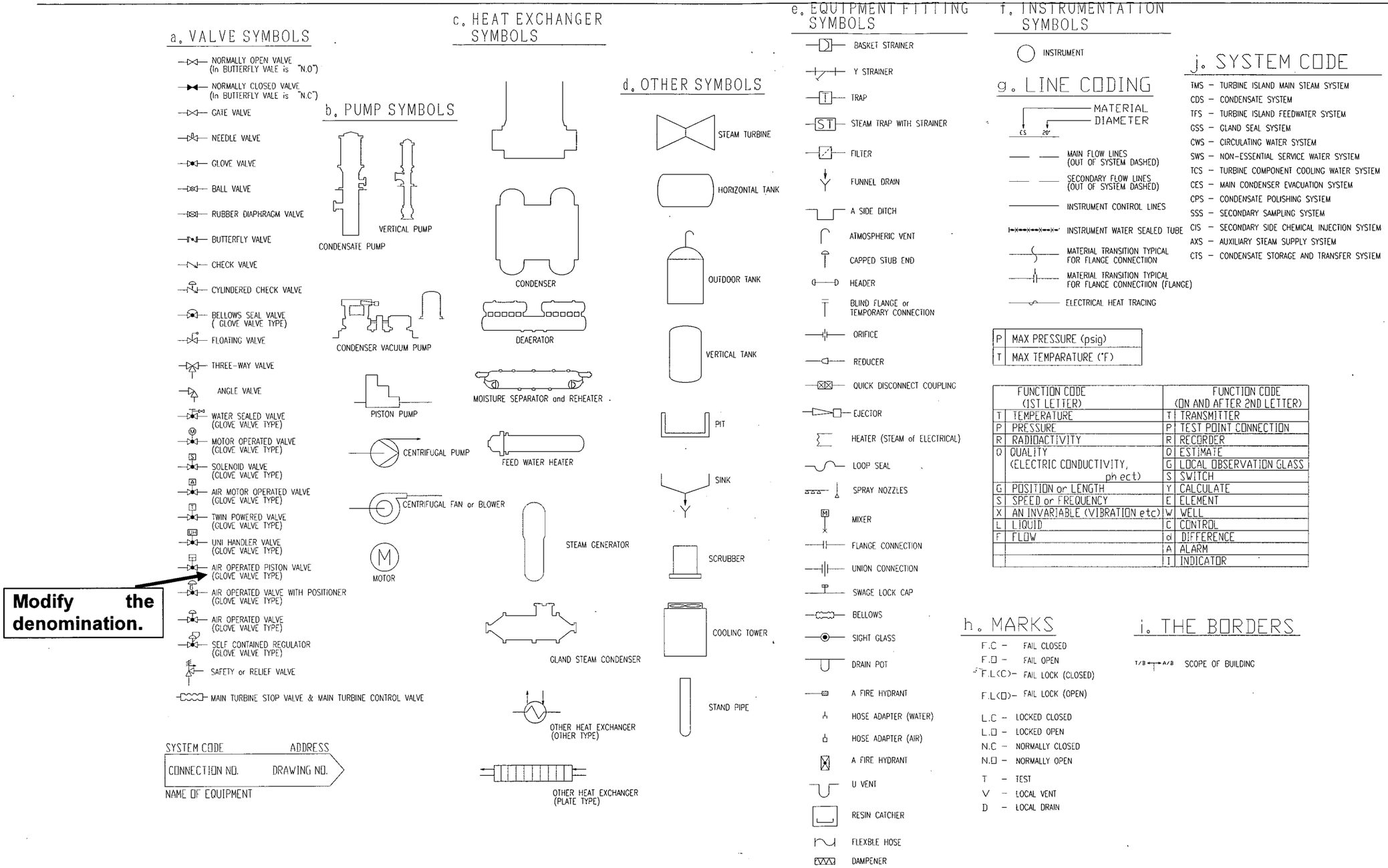
    See Attachment 2 for mark-ups of DCD Figure.9.2.8-1.

Impact on COLA

There is no impact on COLA.

Impact on PRA

There is no impact on PRA.



Modify the denomination.

Figure 1.7-5 Legend for Piping and Instrumentation Diagrams of Secondary System

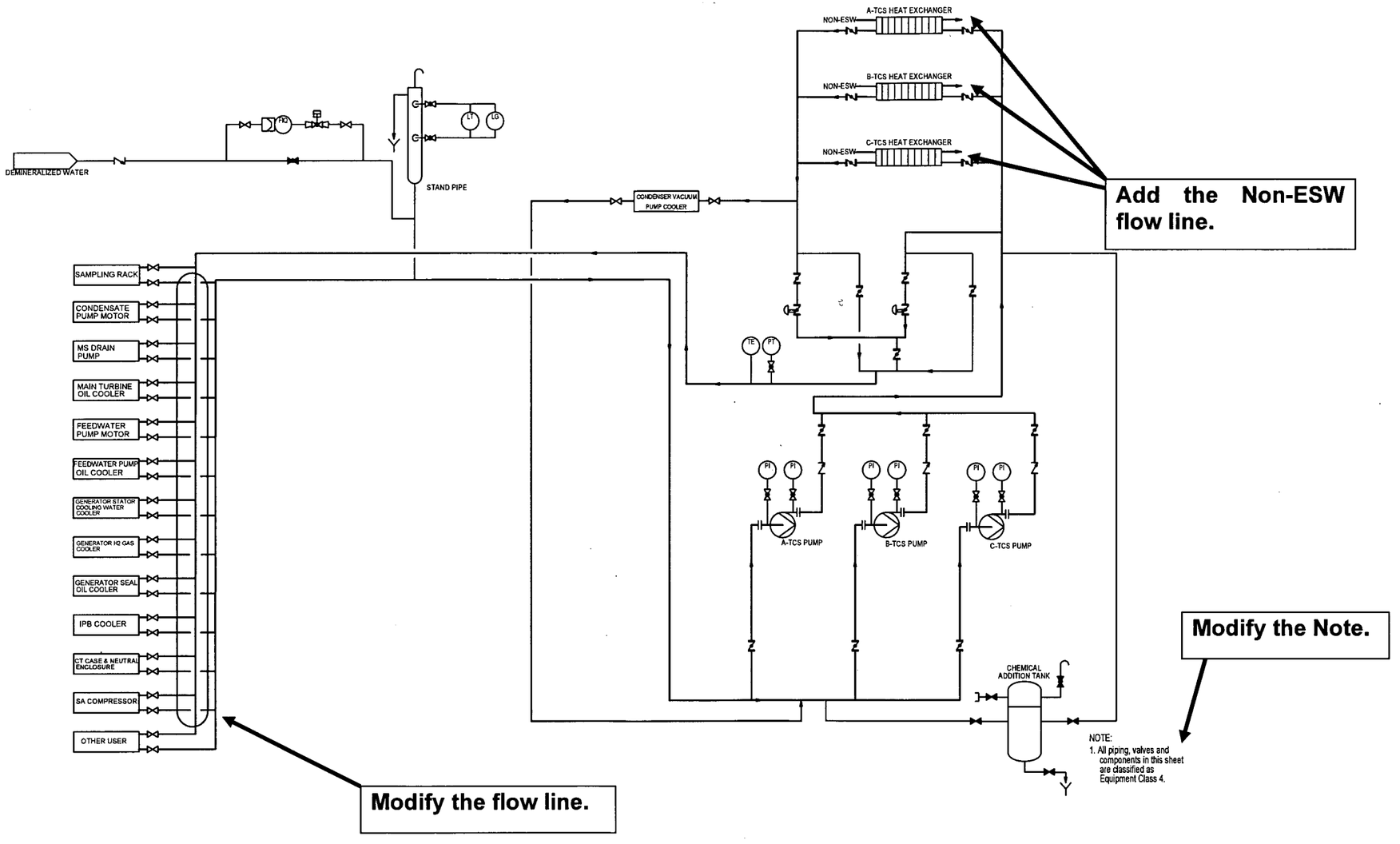


Figure 9.2.8-1 Turbine Component Cooling Water System Piping and Instrumentation Diagram