MITSUBISHI HEAVY INDUSTRIES, LTD.
16-5, KONAN 2-CHOME, MINATO-KU
TOKYO, JAPAN

June 1, 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-09271

Subject: MHI's Amended Response to US-APWR DCD RAI No.124-1638 Revision 1 and RAI No.160-1848 Revision 0

Reference: 1) "MHI's Response to US-APWR DCD RAI No.124-1638 Revision 1," MHI Ref: UAP-HF-08310, dated December 25, 2008.
2) "MHI's Response to US-APWR DCD RAI No.160-1848 Revision 0," MHI Ref: UAP-HF-09062, dated February 20, 2009.

With this letter, Mitsubishi Heavy Industries, Ltd. ("MHI") transmits to the U.S. Nuclear Regulatory Commission ("NRC") a document entitled "Amended Response to US-APWR DCD RAI". This amended response is submitted to reflect the result on conference call discussion on April 28, 2009.

Enclosed are the amended response to Question 10.04.07-1 contained within Reference 1 and Question 10.04.09-4 contained within Reference 2. MHI replaces the previous letters (Reference 1 and 2) with this amended response letter.

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. Amended Response to RAI No.124-1638 Revision 1 Question 10.04.07-1
2. Amended Response to RAI No.160-1848 Revision 0 Question 10.04.09-4

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

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<u>Contact Information</u>

C. Keith Paulson, Senior Technical Manager
Mitsubishi Nuclear Energy Systems, Inc.
300 Oxford Drive, Suite 301
Monroeville, PA 15146
E-mail: ck_paulson@mnes-us.com
Telephone: (412) 373-6466

Enclosure 1

UAP-HF-09271
Docket No. 52-021

Amended Response to RAI No.124-1638 Revision 1
Question 10.04.07-1

June 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

6/1/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 124-1638 REVISION 1**
SRP SECTION:	**10.04.07 – Condensate and Feedwater System**
APPLICATION SECTION:	**10.4.7**
DATE OF RAI ISSUE:	**12/4/2008**

QUESTION NO.: 10.4.7-1

GDC 4 requires safety-related portions of the condensate and feedwater system (CFS) to be protected against hydraulic instabilities such as water-hammer events. Branch Technical Position (BTP) 10-2, "Design Guidelines to Avoid Water Hammer in Steam Generators," and NRC Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," contain design guidelines and recommendations to reduce, or eliminate piping damage caused by water hammer transients.

FSAR Tier 2, Section 10.4.7.7 provides a discussion of the design features to minimize the potential for water hammer. It is stated in this section of the DCD that water hammer prevention and mitigation is implemented in accordance with NUREG-0927, "Evaluation of Water Hammer Occurrence in Nuclear Power Plants." NUREG-0927 recommends the development and use of adequate operating and maintenance procedures to aid in reducing the frequency of water hammer events. The COL application does not include a COL information item for applicants to review operating and maintenance procedures to ensure that they include precautions to minimize or eliminate water hammer.

The staff requests that the applicant propose a COL information item to provide operating and maintenance procedures to address water hammer issues for the CFS.

ANSWER:

MHI agrees to add the new COL information item to provide operating and maintenance procedures to address water hammer.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 10.4.7.
A description of the operating and maintenance procedures to address water hammer issues will be added to DCD 10.4.7 and new COLA item 10.4(6) that ensures development of the operating and maintenance procedures by the COL applicant will be added to DCD 10.4.12 Combined License Information. Some supplemental descriptions regarding water hammer mitigation and measures will be added to DCD 10.4.7.

DCD Table 1.8.2 Compilation of All Combined License Applicant Items for Chapters 1-19 (sheet 29 of 44) will be revised as shown below.

COL ITEM NO.	COL ITEM
COL 9.5(9)	*The COL Applicant addresses the emergency communication system requirements delineate in 10 CFR 73.55(f) such that a single act cannot remove onsite capability of calling for assistance and also as redundant system during onsite emergency crisis.*
COL 9.5(10)	*Deleted*
COL 10.2(1)	*Inservice Inspection* *The Combined License Applicant is to develop turbine maintenance and inspection procedure and then to implement prior to fuel load. Plant startup procedure including warm-up time will be completed therein.*
COL 10.3(1)	*FAC monitoring program; The Combined License Applicant ~~is to address preparation~~ will provide a description of ~~a~~ the FAC monitoring program for carbon steel portions of the steam and power conversion systems that contain water or wet steam. The description will be address consistency with Generic Letter 89-08 and NSAC-202L-R3 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 10.4(1)	*Circulating Water System; The Combined License Applicant is to determine the site specific final system configuration and system design parameters for the CWS including makeup water and blowdown.*
COL 10.4(2)	*Steam Generator Blowdown System; The Combined License applicant is to address the discharge to Waste Water System including site specific requirements.*
COL 10.4(3)	*Deleted*
COL 10.4(4)	*Deleted*
COL 10.4(5)	*System Design for Steam Generator Drain; The Combined License applicant is to address the nitrogen or equivalent system design for Steam Generator Drain Mode. (This is dependent on Waste water system design)*
COL 10.4(6)	*Operating and maintenance procedures for water hammer prevention; The Combined License Applicant will develop a milestone schedule for implementation of the procedure.*

Impact on COLA

The resolution regarding COL 10.4(6) that describes a milestone schedule for implementation of the procedures will be added to FSAR chapter 10.4.7.

Impact on PRA

There is no impact on the PRA.

Attachment 1
US-APWR DCD Tier 2 10.4.7 Mark-up
Amended Response to RAI No.124-1638 Revision 1 Question 10.04.07-1

are described in Chapters 7 and 8.

For a FLB inside the containment or a MSLB, the MFIVs, MFRVs, MFBRVs and SGWFCVs automatically close upon receipt of a feedwater isolation signal. The signals that produce a feedwater isolation signal are identified and discussed in Section 7.3.

The MFIVs are provided with solenoid valves supplied by redundant power divisions. Failure of either of the power divisions does not prevent closure of the MFIV during an accident condition. Releases of radioactivity from the CFS, resulting from the main feedwater line break, are minimal because of the negligible amount of radioactivity in the system under normal operating conditions.

For a steam generator tube rupture (SGTR) event, feedwater isolation is provided for the main feedwater with isolation signals generated by the reactor protection system. Refer to Section 7.3 and Chapter 15 for details.

~~The feedwater piping at the SGs is sloped so that it does not drain into the SGs. This feature helps avoid the formation of a steam pocket in the feedwater piping which, when collapsed, could create a water hammer.~~

10.4.7.4 Inspection and Tests

10.4.7.4.1 Preoperational Testing

Preoperational testing of the CFS is performed as described in Chapter 14.

Valve Testing and Inspection

The MFIVs, MFRVs, MFBIVs, and SGWFCV, are tested to check closing time prior to startup.

System Testing

The CFS is designed to allow system operation testing for both normal and emergency operating modes. This includes testing of applicable protection system components.

The safety-related components of the system are designed and located to permit pre-service and in-service inspection.

Pipe Testing

The safety-related main feedwater piping within the containment and main steam/feedwater piping area are visually and volumetrically inspected at installation per ASME code Section XI (Reference 10.4-12) pre-service inspection requirements.

10.4.7.4.2 In-Service Testing

The structural leaktight integrity and the performance of the system components are demonstrated by operation. A description of periodic in-service inspection and the deaerator storage tank, control the deaerator level. Condensate flow to the deaerator is regulated by two split ranged control valves upstream of the deaerator. During normal power generation, the valves are regulated by a three element control system; total feedwater flow is used as a feed forward demand signal, and the control is trimmed by measured feedback of total condensate flow and deaerator storage tank level.

In the event a feedwater heater experiences a sizable tube leak or a feedwater heater water level control valve fails closed, the main turbine is protected from failure due to flooding on the shell side of a feedwater heater and subsequent water induction into the moving turbine blades. This is accomplished by automatic closure of the isolation valve in the steam extraction line to that heater and opening the high-level dump control valve that dumps the heater excess drains to the condenser. For heaters that do not have extraction line isolation valves, condensate isolation valves are automatically closed to isolate condensate flow to the heater tubes.

The total water volume in the CFS is maintained through automatic makeup and rejection (from the condensate pump discharge) of condensate to the condensate storage tank. The system makeup and rejection are controlled by the condenser hotwell level controller. Level transmitters are provided at the condenser hotwell for use by the hotwell level controller.

The system water quality requirements are automatically maintained through the injection of an oxygen scavenging agent and a pH control agent into the CDS. The pH control agent and oxygen scavenging agent injection is controlled by pH and the level of oxygen scavenging agent residual in the system is continuously monitored by the SSS.

Instrumentation, including pressure indication, flow indication, and temperature indication, required for monitoring the system, are provided in the main control room.

10.4.7.6 Flow-Accelerated Corrosion

Refer to Subsection 10.3.6.3.

10.4.7.7 Water Hammer Prevention

Refer to Subsection 5.4.2.1.2.11 for a description of SG design features to prevent a fluid flow water hammer. The main feedwater connection on each of the SGs is the highest point of each feedwater line downstream of the MFIV~~, and is sloped so that it does not drain into the SGs~~. The feedwater lines contain no high-point pockets that could trap steam and lead to a water hammer. The horizontal pipe length from the main nozzle to the downward turning elbow of each SG is minimized.

The FWS and SG design minimize the potential for a water hammer and subsequent effects. Feedwater piping analysis considers the following factors and events in the evaluation:

- SGs with top feed ring design

- Rapid closure of the MFCV due to line breaks
- Spurious MFIV or MFRV trips
- Pump trips
- Deaerator regulating flow control valve trip
- Feedwater piping, anchors, supports, and snubbers, as applicable

Prevention and mitigation of a feedline-related water hammer is accomplished through operation of the feedwater delivery system. The design features avoids the formation of a steam pocket in the feedwater piping which, when collapsed, could create a hydraulic instability.

Water hammer prevention and mitigation are implemented in accordance with the following as specified in NUREG-0927 (Reference 10.4-10):

- Preventive design measures, i.e. consideration of water draining prevention from the feed ring and minimization of the horizontal run of inlet piping to the SG, and testing against a water hammer for the SG feedwater ring are performed in accordance with BTP ASB10-2 (Reference 10.4-11).
- Adequate preventive design measures, i.e. consideration of MFRV over sizing and instability, reduce the frequency and severity of a water hammer.
- Operator's caution, training, operational procedure and maintenance procedure (warm-up of line, adequate valve operation, vent/drain and removal of void, etc.) reduce the frequency and severity of a water hammer.
- As for a water hammer anticipated by intended system operation (or steam hammer), generated load is considered for piping and support designs.

Each main feedwater line includes the MFCV installed outside containment. During normal and upset conditions, the MFCV prevents reverse flow from the SG whenever the feedwater pumps are tripped. In addition, the closure of the valves prevents more than one SG from blowing down in the event of a feedwater pipe break. The MFCV is designed to limit blowdown from the SG and to prevent a slam resulting in potentially severe pressure surges due to a water hammer. The valves are designed to withstand the closure forces encountered during the normal, upset and faulted conditions. Rapid closure associated with a feedline break does not impose unacceptable loads on the SG.

The Combined License Applicant is to provide operating and maintenance procedures in accordance with NUREG-0927. The procedures should address:

- Prevention of rapid valve motion
- Introduction of voids into water-filled lines and components
- Proper filling and venting of water-filled lines and components

- Introduction of steam or heated water that can flash into water-filled lines and components
- Introduction of water into steam-filled lines or components
- Proper warmup of steam-filled lines
- Proper drainage of steam-filled lines
- The effects of valve alignments on line coditions.

10.4.12 Combined License Information

COL 10.4(1) Circulating Water System

The Combined License Applicant is to determine the site specific final system configuration and system design parameters for the CWS including makeup water and blowdown.

COL 10.4(2) Steam Generator Blowdown System

The Combined License applicant is to address the discharge to Waste Water System including site specific requirements.

COL 10.4(3) Deleted.

COL 10.4(4) Deleted.

COL 10.4(5) System Design for Steam Generator Drain

The Combined License applicant is to address the nitrogen or equivalent system design for Steam Generator Drain Mode. (This is dependent on Waste water system design)

COL 10.4(6) Operating and maintenance procedures for water hammer prevention

The Combined License Applicant will develop a milestone schedule for implementation of the procedure.

Enclosure 2

UAP-HF-09271
Docket No. 52-021

Amended Response to RAI No. 160-1848 Revision 0
Question 10.04.09-4

June 2009

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

6/1/2009

US-APWR Design Certification

Mitsubishi Heavy Industries

Docket No. 52-021

RAI NO.:	**NO. 160-1848 REVISION 0**
SRP SECTION:	**10.4.9 AUXILIARY FEEDWATER SYSTEM (PWR)**
APPLICATION SECTION:	**10.4.9**
DATE OF RAI ISSUE:	**1/21/2009**

QUESTION NO.: 10.04.09-4

In DCD Tier 2 Section 14.2, the applicant includes instructions for the COL Holder to check for water hammer during normal system startup and operation conditions during motor-driven EFWS preoperational testing (14.2.12.1.24) and during turbine-driven EFWS preoperational testing (14.2.12.1.25). The COL Holder is also instructed to check for unacceptable water hammer during restoration of normal steam generator level from low water level as part of feedwater preoperational testing (14.2.12.1.29). The staff reviewed the design and test provisions, and considered them to be appropriate for minimizing water hammer events, but there was no information presented in the DCD that will ensure development of operating and maintenance procedures by the COL applicant that will minimize the potential for water hammer in the EFWS during operation. Additionally, there is no mention that lines need to be water-solid to prevent air entrainment.

Compliance with the requirements of GDC 4 includes meeting the guidance of Branch Technical Position (BTP) 10-2, "Design Guidelines to Avoid Water Hammer in Steam Generators." Also, Generic Letter 2008-01, "Managing Gas Accumulation in Emergency Core Cooling, Decay Heat Removal, and Containment Spray Systems," states that lines should be sufficiently filled with water to ensure that any gas accumulation is below the amount needed to challenge system operability.

Explain how the DCD will ensure development of operating and maintenance procedures by the COL applicant that will minimize the potential for water hammer in the EFWS during operation. Also, explain how the DCD will ensure that the COL applicant will maintain EFWS piping sufficiently filled with water such that any gas accumulation is below the amount needed to challenge system operability. Include this information in the DCD and provide a markup in your response.

ANSWER:

MHI agrees to add the new COL information item to provide operating and maintenance procedures to address water hammer. The operating and maintenance procedures include monitoring of EFWS pipe fill conditions.

Impact on DCD

See Attachment 1 for a mark-up of DCD Tier 2, Section 10.4.9.
A description of the operating and maintenance procedures to address minimization of potential water hammer in the EFWS will be added to DCD 10.4.9 and new COLA item 10.4(6) that ensures

development of the operating and maintenance procedures by the COL applicant will be added to DCD 10.4.12 Combined License Information. Some supplemental descriptions regarding water hammer mitigation and measures will be added to DCD 10.4.9.

DCD Table 1.8.2 Compilation of All Combined License Applicant Items for Chapters 1-19 (sheet 29 of 44) will be revised as shown below.

COL ITEM NO.	COL ITEM
COL 9.5(9)	*The COL Applicant addresses the emergency communication system requirements delineate in 10 CFR 73.55(f) such that a single act cannot remove onsite capability of calling for assistance and also as redundant system during onsite emergency crisis.*
COL 9.5(10)	*Deleted*
COL 10.2(1)	*Inservice Inspection* *The Combined License Applicant is to develop turbine maintenance and inspection procedure and then to implement prior to fuel load. Plant startup procedure including warm-up time will be completed therein.*
COL 10.3(1)	*FAC monitoring program; The Combined License Applicant ~~is to address preparation~~ will provide a description of ~~a~~ the FAC monitoring program for carbon steel portions of the steam and power conversion systems that contain water or wet steam. The description will be address consistency with Generic Letter 89-08 and NSAC-202L-R3 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 10.4(1)	*Circulating Water System; The Combined License Applicant is to determine the site specific final system configuration and system design parameters for the CWS including makeup water and blowdown.*
COL 10.4(2)	*Steam Generator Blowdown System; The Combined License applicant is to address the discharge to Waste Water System including site specific requirements.*
COL 10.4(3)	*Deleted*
COL 10.4(4)	*Deleted*
COL 10.4(5)	*System Design for Steam Generator Drain; The Combined License applicant is to address the nitrogen or equivalent system design for Steam Generator Drain Mode. (This is dependent on Waste water system design)*
COL 10.4(6)	*Operating and maintenance procedures for water hammer prevention; The Combined License Applicant will develop a milestone schedule for implementation of the procedure.*

Impact on COLA

The resolution regarding COL 10.4(6) that describes a milestone schedule for implementation of the procedure will be added to FSAR chapter 10.4.9.

Impact on PRA

There is no impact on the PRA.

Attachment 1
US-APWR DCD Tier 2 10.4.9 Mark-up
Amended Response to RAI No.160-1848 Revision 1 Question 10.04.09-4

C. Steam generator tube rupture

Upon detection of a water level increase of the SG, the EFW isolation valves and EFW control valves are automatically closed.

The failure modes and effects analysis given in Table 10.4.9-4 demonstrates that required EFW flow is ensured to the SGs during postulated accident conditions with a single failure in the EFWS.

~~EFW and main feedwater piping configuration to preclude water hammer is discussed in Subsection 10.4.7.~~

10.4.9.2.1 Description of Major Components

A description of the major components and features in the EFWS is as follows:

A. Emergency feedwater pumps

Each EFW pump is normally aligned to feed one SG. Each EFW pump takes suction from one of two EFW pits and the discharge flow is directed to one of the four SGs.

The EFW pump is designed to develop adequate head to supply the design flow of at least 400 gpm to each SG, when the SG pressure is equivalent to the set pressure of the first stage of the main steam safety valve (safety valve with lowest set pressure) plus 3% of accumulation.

The maximum EFW pump flow is limited by the motor-operated EFW control valves which have a preset open position.

A mini flow line from the EFW pump discharge line to the EFW pit with a normally open valve and an orifice is provided to maintain minimum recirculation flow required for pump protection. The minimum flow line ensures a minimum recirculation flow for pump cooling whenever the pumps are running. Among 2 units of A and B and among 2 units of C and D, the minimum flow line is shared. Following the requirements in NRC IE Bulletin IEB 88-04, the minimum flow line is given sufficient capacity so that either of the pumps which share a minimum flow line does not become dead-head. A separate full flow line with a normally closed valve and an orifice allows pump testing during normal plant operation at the pump design flow rate without injection to the SGs. Both the mini flow line and full flow line ~~is~~ are routed to the EFW pit by a common header.

Two motor-driven and two turbine-driven EFW pumps, with different power supplies are provided. Two motor-driven EFW pumps connect to each different safety ac bus to achieve the specific safety functions in case of off-site power loss; each bus is backed by a redundant emergency power source. Table 10.4.9-6 presents the power sources for EFWS components.

The EFW pumps automatically start on receipt of LOOP signal, ECCS actuation signal, main feedwater pumps trip (all pumps) signal, or low steam generator water level signal in any one of SGs.

B. Motor-driven (M/D) emergency feedwater pumps

Two of the four EFW pumps are horizontal, centrifugal pumps driven by electric motors isolated automatically as described in the FLB accident analysis. The EFW function is not needed during the mitigation of the MSLB accident, but is needed only for cooldown up to the RHR system initiation.

(f) Station Blackout (SBO)

A SBO results in the loss of normal offsite and emergency onsite ac power sources. The M/D-EFW pumps are inoperable because there is no ac power. Both T/D EFW pumps are available because of the dc power supplied by class 1E batteries with 2 hours capacities. EFW flow control is also available because the EFW flow control valves are powered by dc power which is available from class 1E batteries. In addition, at least within 1 hour after the SBO occurrence, 1 unit of the AAC-GTG is started, and by the operation of 1 unit of emergency feedwater pump (turbine-driven) area air handling unit, the integrity of 1 unit of T/D EFW pump is ensured. From the above, in accordance with the generic recommendations of NUREG-0611 and NUREG-0635 Generic Short Term Recommendation No. 5 (GS-5), the EFWS is capable of providing required EFW flow for at least two hours from one T/D-EFW pump independent of any ac power source. After starting the operation of the AAC-GTG, charging to the Class 1E battery/batteries is resumed, therefore, the turbine-driven EFW pump is able to continue to operate after 2 hours of the SBO and is independent of any ac power source.

(g) Anticipated Transient Without Scram (ATWS)

The acceptance criteria for an ATWS is to provide adequate heat removal such that the maximum RCS pressure is limited to less than the emergency stress limit. For this event, the EFWS is actuated by the DAS (diverse actuation system).

(h) Steam Generator Tube Rupture (SGTR)

The SGTR is a postulated accident that assumes that, a SGTR and the reactor coolant flows to the secondary side of the SG. The EFW pump automatically starts on receipt of an ECCS actuation signal. Upon detection of a water level increase in the faulted SG, the EFW isolation valve to the all SG is automatically closed. When all pumps start and operate without failure, the SG water level is verified in all SGs. If there is no potential for decrease in SG level, the pump is stopped depending on the condition. The emergency operating procedures provide additional details for operator actions during the accident conditions.

A summary of system performance for various accident conditions is provided in Table 10.4.9-3. The table includes flows to both the faulted and intact SGs. Comparing these data with those in Table 10.4.9-2, it is seen that minimum flow requirements for the intact SGs are satisfied under all failure modes.

C. Water Hammer Prevention

The following items are identified as water hammer prevention and mitigation measures in EFWS:

- Automatic initiation of EFW flow following a loss of main feedwater flow to prevent draining of the SG feedring in accordance with NUREG-0927
- Implementation of EFW pipe refill flow limits to minimize steam-water

entrainment and subsequent formation of water slug. in accordance with BTP 10-2

- Detection of a high temperature main feedwater back leakage from an EFW check valve which becomes the cause of water hammer

The Combined License Applicant is to provide operating and maintenance procedures in accordance with NUREG-0927. The procedures should address:

- Prevention of rapid valve motion
- Introduction of voids into water-filled lines and components
- Proper filling and venting of water-filled lines and components
- Introduction of steam or heated water that can flash into water-filled lines and components
- Introduction of water into steam-filled lines or components
- Proper warmup of steam-filled lines
- Proper drainage of steam-filled lines
- The effects of valve alignments on line conditions.

10.4.9.2.3 Testing and Inspection Requirements

The EFW pumps are hydrostatically tested by the pump vendor in accordance with American Society of Mechanical Engineers (ASME) Section III (Reference 10.4-8), Class 3. Prior to initial plant start-up, the entire EFWS is hydrostatically tested after the installation is complete in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section III (Reference 10.4-8), Class 3. Chapter 14, Initial Test Program, describes testing to verify component installation and initial operation including a pump endurance test in accordance with the additional short-term recommendation "EFW Pump Endurance Test" in the generic recommendations of "NUREG-0611 and NUREG-0635" and the testing of transfer between normal and emergency buses, as well as integrated system testing.

Periodic testing in accordance with Technical Specifications is performed during normal plant operation. The EFWS is designed with provisions for full design flow testing of EFW pumps during normal plant operation. Each pump has a higher capacity orifice line in parallel with the miniflow orifice line to allow the pump to be operated at its design flow rate without injecting water into the SGs during periodic inservice testing. See Section 3.9 for inservice testing and inspection requirements. The EFWS, its initiating signals, and its circuits are capable of being tested periodically while the plant is at power, in accordance with the frequency specified in the Technical Specifications.

During periodic testing of the EFW pumps, manual valve alignment is required. Only one EFW pump is tested at a time. Because each EFW pump is capable of providing 50% of the total required flow, full system flow requirements is available at all times. Additionally, when these valves are changed from their normal position, an alarm is annunciated in the control room to alert the operators. After finishing the periodic testing of EFW pumps, an operator determines that the EFWS valves are properly aligned and a second operator independently verifies that the valves are properly aligned.

10.4.9.2.4 Instrumentation Requirements

The EFWS includes appropriate instrumentation inputs to the safety-related

10.4.12 Combined License Information

COL 10.4(1) Circulating Water System

The Combined License Applicant is to determine the site specific final system configuration and system design parameters for the CWS including makeup water and blowdown.

COL 10.4(2) Steam Generator Blowdown System

The Combined License applicant is to address the discharge to Waste Water System including site specific requirements.

COL 10.4(3) Deleted.

COL 10.4(4) Deleted.

COL 10.4(5) System Design for Steam Generator Drain

The Combined License applicant is to address the nitrogen or equivalent system design for Steam Generator Drain Mode. (This is dependent on Waste water system design)

COL 10.4(6) Operating and maintenance procedures for water hammer prevention

The Combined License Applicant will develop a milestone schedule for implementation of the procedure.