GE Nuclear Energy

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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Charles L. Miller, Director
Standardization and Non-Power Reactor Project Directorate

Subject: Submittal of Responses to Resolve Safety Evaluation Issues as Requested in NRC Letter from Dino C. Scaletti, May 1, 1990.

Reference:
1. P.W. Marriott to Charles L. Miller, same subject, MFN No. 061-90 May 31, 1990.
2. P.W. Marriott to Charles L. Miller, same subject, MFN No. 088-90, July 16, 1990.

Enclosed are thirty four (34) copies of GE responses to resolve two additional subject safety evaluation issues for the Advanced Boiling Water Reactor (ABWR). Reference 1 provided the majority of the responses. The specific issues covered by this transmittal are:

(1) The method of attachment of the level instruments that facilitate the automatic switch over of the HPCF and RCIC pumps from the CST to the suppression pool. (PDSER Section 9.2.9).

(2) Final sizing of the RCW heat exchangers. (PDSER Section 9.2.11).

GE believes that the modifications to the ABWR SSAR provided in the attachment will resolve these issues. It is intended that GE will amend the SSAR with these responses in a future amendment.

Resolution of the final issue pertaining to the remaining portions of the MUWP system that are within the scope of the SSAR will be provided by Reference 2.

Sincerely,

P. W. Marriott, Manager
Regulatory and Analysis Services
M/C 382, (408) 925-6948

cc: F. A. Ross (DOE)
D. C. Scaletti (NRC)
D. R. Wilkins (GE)
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RESOLUTION OF ISSUE (1)

9.2 WATER SYSTEMS

9.2.1 Station Service Water System

The functions normally performed by the station service water system are performed by the systems discussed in Subsection 9.2.11.

9.2.2 Closed Cooling Water System

The functions normally performed by the closed cooling water system are performed by the systems discussed in Subsections 9.2.11, 9.2.12, 9.2.13, and 9.2.14.

9.2.3 Demineralized Water Makeup System

The functions normally performed by the demineralized water makeup system are performed by the systems discussed in Subsections 9.2.8, 9.2.9 and 9.2.10.

9.2.4 Potable and Sanitary Water Systems

Out of ABWR Standard Plant Scope.

9.2.5 Ultimate Heat Sink

Out of ABWR Standard Plant scope. See Subsection 9.2.17.1 for interface requirements.

9.2.6 Condensate Storage Facilities and Distribution System

The functions of the storing and distribution of condensate are described in Subsection 9.2.9.

9.2.7 Plant Chilled Water Systems

The functions of the plant chilled water system are performed by the systems described in Subsections 9.2.12 and 9.2.13.

9.2.8 Makeup Water System (Preparation)

Out of ABWR Standard Plant scope. See Subsection 9.2.17.2 for interface requirements.

9.2.9 Makeup Water System (Condensate)

9.2.9.1 Design Bases

(1) The makeup water-condensate system (MUWC) shall provide condensate quality water for both normal and emergency operations when required.

(2) The MUWC system shall provide a required water quality as follows:

Conductivity (μS/cm) ≤ 0.5 at 25°C
Chlorides, (ppm) ≤ 0.02
pH 5.9 to 8.3 at 25°C
Conductivity and pH limits shall be applied after correction for dissolved CO_2. (The above limits shall be met at least 90% of the time.)

(3) The MUWC system shall supply water for the uses shown in Table 9.2-1.

(4) The MUWC system is not safety related.

(5) The condensate storage tank shall have a capacity of 2,110 m^3. This capacity was determined by the capacity required by the uses shown in Table 9.2-2.

(6) All tanks, piping and other equipment shall be made of corrosion-resistant materials.

(7) The HPCF and RCIC instrumentation, which initiates the automatic switchover of HPCF and RCIC suction from the CST header to the suppression pool, shall be designed to safety-grade requirements (including installation with necessary seismic support). (A)

9.2.9.2 System Description

The MUWC P&ID is shown in Figure 9.2-4 This system includes the following: 410.44

(1) A condensate storage tank (CST) is provided. It is of concrete construction with a stainless steel lining. The volume is shown in Table 9.2-3.

(2) The following pumps take suction from the CST:

A: The instrumentation is mounted in a safety grade standpipe located in the reactor building secondary containment. With no condensate flowing, the water level is the same in both the CST and the standpipe. A suitable correction will be made for the effect of flow upon water level in the standpipe.

tant materials.

(6) The system shall be designed to prevent any radioactive contamination of the purified water.

9.2.10.2 System Description

410.50 The MUWP system P&ID is shown in Figure 9.2-5. This system includes the following:

(1) A purified water storage tank shall be provided outdoors with adequate freeze protection and adequate diking and other means to control spill and leakage.

(2) Two MUWP forwarding pumps shall take suction from the purified water storage tanks. They shall have a capacity of 308 gpm and a discharge head of 114 psi.

(3) Distribution piping, valves, instruments and controls shall be provided.

(4) Any outdoor piping shall be protected from freezing.

(5) All surfaces coming in contact with the purified water shall be made of corrosion-resistant materials.

(6) All pumps shall be located at an elevation such that adequate suction head is present at all levels in the purified water storage tanks.

(7) Instruments shall be provided to indicate purified water storage tank level in the main control room.

9.2.10.3 Safety Evaluation

Operation of the MUWP system is not required to assure any of the following conditions:

(1) integrity of the reactor coolant pressure boundary;

(2) capability to shut down the reactor and maintain it in a safe shutdown condition; or

(3) ability to prevent or mitigate the consequences of events which could result in potential offsite exposures.

The MUWP system is not safety-related. However, the systems incorporate features that assure reliable operation over the full range of normal plant operations.

9.2.10.4 Tests and Inspections

The makeup water purified distribution system is proved operable by its use during normal plant operation. Portions of the system normally closed to flow can be tested to ensure operability and integrity of the system.

The air-operated isolation valves are capable of being tested to assure their operating integrity by manual actuation of a switch located in the control room and by observation of associated position indication lights.

Flow to the various systems is balanced by means of manual valves at the individual takeoff points.

9.2.11 Reactor Building Cooling Water System

9.2.11.1 Design Bases

9.2.11.1.1 Safety Design Bases

(1) The reactor building cooling water (RCW) system shall be designed to remove heat from plant auxiliaries which are required for a safe reactor shutdown, as well as those auxiliaries whose operation is desired following a LOCA, but not essential to safe shutdown. (B)

(2) The RCW system shall be designed to perform its required cooling functions following a LOCA, assuming a single active or passive failure.

(3) The safety-related portions and valves isolating the nonsafety-related portions of

(B) The heat removal capacity is based on the heat removal requirement during LOCA with the maximum ultimate heat sink temperature, 95°F. As shown in Table 9.2-4, the heat removal requirement is higher during other plant operation modes, such as shutdown at 4 hours. However, the RCW system is not designed to remove this larger amount of heat when the ultimate heat sink is at the maximum temperature.

TABLE 9.2-4d

DESIGN CHARACTERISTICS FOR REACTOR BUILDING COOLING WATER SYSTEM COMPONENTS

RCW Pumps	RCW (A)/(B)	RCW (C)
Discharge Flow Rate	5,720 gpm/pump	~~4,480~~ 4,840 gpm/pump
Pump Total Head	82 psig	75 psig
Design Pressure	200 psig	200 psig
Design Temperature	158°F	158°F
RCW Heat Exchangers	RCW (A)/(B)	RCW (C)
Capacity	~~60~~ 68 x 10^6 BTU/h	~~50~~ 63 x 10^6 BTU/h
RCW Surge Tanks		
Capacity	Equal to 30 days of normal leakage	
Design Pressure	Static Head	
Design Temperature	158°F	
RCW Chemical Addition Tanks		
Design Pressure	200 psig	
Design Temperature	158°F	
RCW Piping		
Design Pressure	200 psig	
Design Temperature	158°F	

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