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MFN 07-455, Supplement 4

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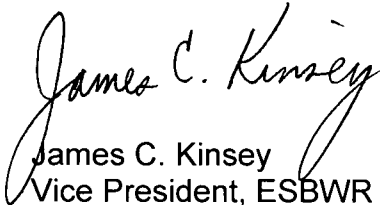
U.S. Nuclear Regulatory Commission  
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Subject: **Response to Portion of NRC Request for Additional  
Information Letter No. 126 Related to ESBWR Design  
Certification Application, RAI Number 22.5-1 S01**

The purpose of this letter is to submit the GE Hitachi Nuclear Energy (GEH) response to the U.S. Nuclear Regulatory Commission (NRC) Request for Additional Information (RAI) sent by NRC letter dated December 20, 2007 (Reference 1). Previous RAIs and responses were transmitted in References 2 and 3. The GEH response to RAI Number 22.5-1 S01 is in Enclosure 1.

If you have any questions or require additional information, please contact me.

Sincerely,



James C. Kinsey  
Vice President, ESBWR Licensing

DO68  
NRO

Reference:

1. MFN-07-718, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request For Additional Information Letter No. 126 Related To ESBWR Design Certification Application*, December 20, 2007.
2. MFN 07-509, *Response to Portion of NRC Request for Additional Information Letter No.101 Related to ESBWR Design Certification Application, RAI Numbers 22.5-1, 22.5-10 and 22.5-11*. October 5, 2007.
3. MFN 07-357, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request for Additional Information Letter No. 101 Related to ESBWR Design Certification Application*. June 21, 2007.

Enclosures:

1. Enclosure 1, MFN 07-455, Supplement 4, Response to Portion of NRC Request for Additional Information Letter No. 126 Related to ESBWR Design Certification Application, Regulatory Treatment of Non-Safety Systems (RTNSS), RAI Number 22.5-1 S01
2. Enclosure 1, Attachment 1, DCD Tier 1 Markup, Section 2.12.3, Reactor Component Cooling Water System Design Description, Table 2.12.3-1, ITAAC For The Reactor Component Cooling Water System, Figure 2.12.3-1, Reactor Component Cooling Water System

cc: AE Cubbage      USNRC (with enclosure)  
GB Stramback      GEH/San Jose (with enclosure)  
RE Brown          GEH/Wilmington (with enclosure)  
DH Hinds          GEH/Wilmington (with enclosure)  
eDRF              0000-0080-9888

**Enclosure 1**

**MFN 07-455, Supplement 4**

**Response to Portion of NRC Request for**

**Additional Information Letter No. 126**

**Related to ESBWR Design Certification Application**

**Regulatory Treatment of Non-Safety Systems (RTNSS)**

**RAI Number 22.5-1 S01**

For historical purposes, the original text of RAI 22.5-1 and the GEH response is included, except for any attachments or DCD mark-ups.

### **NRC RAI 22.5-1**

*Section 14.3.7.3 states that RTNSS systems shall have Tier 1 inputs that include design descriptions and ITAAC. The staff finds that the above position is not implemented consistently throughout the DCD. The inconsistency is shown in the following examples:*

*A. In the response to RAI 14.3.69, the applicant recognized that the PSWS is a RTNSS system, but determined that an inspection, test and analyses, and acceptance criteria (ITAAC) is not required for PSWS.*

*B. In Revision 3, DCD Tier 1, Section 2.12.3, the RCCWS ITAAC was revised to remove the information of design descriptions and system drawings, design commitment, scope of ITAAC.*

*C. In Revision 3, DCD Tier 1, Section 2.12.5, the CWS ITAAC was revised to remove a large portions of the information described of a system description and system drawings, design commitment, scope of ITAAC. Review and revise DCD Tier 1 to consistently include all RTNSS systems in Tier 1 for ITAAC.*

### **GEH Response (original)**

For a passive plant, the safety-significant nonsafety-related SSCs are determined by applying the Regulatory Treatment of Non-Safety Systems (RTNSS) criteria. Systems with system-level or component-level safety-related, RTNSS, Infrequent Event and/or Special Event (e.g., ATWS, Station Blackout and Safe Shutdown Fire in Tier 2, Chapter 15) mitigation functions or have a design characteristic, feature or function (DCFF) required for meeting a regulation shall have Tier 1 inputs that include Design Description (DD) and inspection, test and analyses, and acceptance criteria (ITAAC). (Ref. DCD Tier 2 subsection 14.3.7.3)

DCD Tier 1 Rev 4 was revised to provide Tier 1 inputs including DD and ITAAC for all systems providing RTNSS functions.

A. The Plant Service Water System (PSWS) is subject to additional regulatory oversight for its nonsafety-related post-72 hour cooling functions. A DD and ITAAC are provided addressing the specific RTNSS functions credited for the system.

B. The Reactor Component Cooling Water System (RCCWS) is subject to additional regulatory oversight for its nonsafety-related functions. A DD and ITAAC are provided addressing the specific RTNSS functions credited for the system.

C. The Chill Water System (CWS) is subject to additional regulatory oversight for its nonsafety-related functions. A DD and ITAAC are provided addressing the specific RTNSS functions credited for the system.

### **DCD Impact**

DCD Tier 1 Rev 4 was revised to provide Tier 1 inputs including DD and ITAAC for all systems supporting RTNSS functions as described in DCD Tier 2 Chapter 19.

**NRC RAI 22.5-1 S01**

*NRC Summary: Missing a drawing for RCCWS ITAAC*

*NRC Full Text:*

*In DCD Tier 1, Revision 4, Table 2.12.3-1, Item 1 is not adequate because it does not have a figure to perform as-built system inspection. Provide a schematic of the RCCWS in Tier 1 Section 2.12.3.*

**GEH Response**

The RCCW System is a nonsafety-related system. However, RCCWS is included under the scope of RTNSS. Therefore, a schematic of the RCCWS is provided in DCD Tier 1, Rev. 5.

**DCD Impact**

DCD Tier 1, Section 2.12.3 will be revised and a schematic for RCCWS is provided. Furthermore, DCD Tier 1, Table 2.12.3-1 will be revised under Revision 5 to reference the added schematic of the RCCWS.

These revisions are shown as noted in the attached markup.

## Attachment 1

### DCD Tier 1 Revision 4 Markup

Section 2.12.3, Reactor Component Cooling Water System Design Description

Table 2.12.3-1 ITAAC For The Reactor Component Cooling Water System

Figure 2.12.3-1 Reactor Component Cooling Water System

### 2.12.3 Reactor Component Cooling Water System

#### Design Description

The Reactor Component Cooling Water System (RCCWS) does not perform any safety-related function. Therefore, the RCCWS has no safety design basis. The RCCWS is subject to additional regulatory oversight for its nonsafety-related functions to provide post 72-hour cooling to the nuclear island chillers and diesel generators and to provide cooling support to FAPCS under LOPP conditions.[PLC1]

The functional arrangement of the RCCWS is that it consists of two 100% capacity independent and redundant trains. Both trains share a chemical addition tank. The pumps in each train discharge to a common header leading to the RCCWS heat exchangers header. RCCWS cooling water is supplied to the following major users:

- Chilled Water System (CWS) Nuclear Island chiller-condenser
- RWCU/SDC non-regenerative heat exchanger
- FAPCS heat exchanger
- Standby On Site AC Power Supply Diesel Generators

The functional arrangement of the RCCWS is shown on Figure 2.12.3-1.

- (1) The RCCWS functional arrangement is described in the Design Description of Section 2.12.3.
- (2) The RCCWS provides the nonsafety-related function to support post-72 hour cooling for nuclear island chillers and diesel generators and to provide cooling support for FAPCS under LOPP conditions.
- (3) The RCCWS can be operated and controlled from the MCR.
- (4) RCCWS flow indication is provided in the MCR.

#### Inspections, Tests, Analyses and Acceptance Criteria

Table 2.12.3-1 provides definitions of the inspections, tests, and/or analyses, together with associated acceptance criteria for the RCCWS.

Table 2.12.3-1

## ITAAC For The Reactor Component Cooling Water System

Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria
1. The RCCWS functional arrangement is described in the Design Description of Section 2.12.3 <u>and is shown on Figure 2.12.3-1.</u>	Inspection of the as-built system will be performed.	Report(s) document that the as-built RCCWS System conforms to the functional arrangement described in the Design Description of this Section 2.12.3 <u>and as shown on Figure 2.12.3-1.</u>
2. The RCCWS provides the nonsafety-related function to support post-72 hour cooling for nuclear island chillers and diesel generators and to provide cooling support for FAPCS under LOPP conditions.	Testing of the RCCWS will be performed to demonstrate flow to the nuclear island chillers, diesel generators and FAPCS.	A report documents that the RCCWS test demonstrates flow to the nuclear island chillers, diesel generators, and FAPCS.
3. The RCCWS can be operated and controlled from the MCR.	Testing to demonstrate flow capability will be performed on the RCCWS components using controls in the MCR.	A report documents that the MCR controls caused the RCCWS components to operate during the flow test.
4. RCCWS flow indication is provided in the MCR.	Inspection will verify that RCCWS flow indication can be retrieved in the MCR.	A report documents that the inspection verifies that RCCWS flow indication can be retrieved in the MCR.



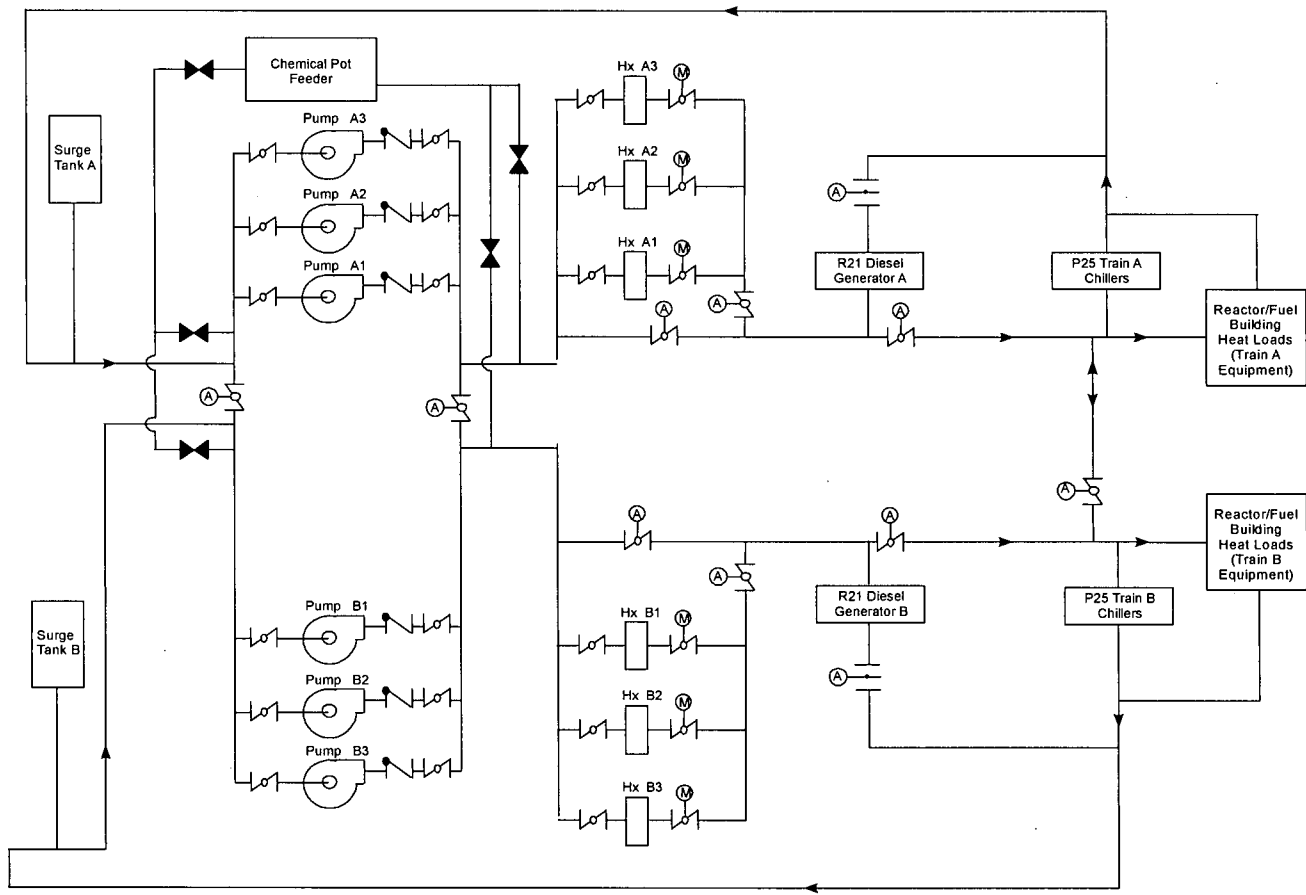


Figure 2.12.3-1. Reactor Component Cooling Water System