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MFN 06-436 Supplement 1

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Subject: **Response to Portion of NRC Request for Additional Information Letter No. 79 - Containment Systems - RAI Number 6.2-118 S01**

Enclosure 1 contains the GE-Hitachi Nuclear Energy Americas LLC (GEH) response to the subject NRC RAI originally transmitted via the Reference 1 letter and supplemented by an NRC request for clarification.

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

Sincerely,

Kathy Sedney for

James C. Kinsey
Project Manager, ESBWR Licensing

D068

NRO

Reference:

1. MFN 06-393, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 79 Related to ESBWR Design Certification Application*, October 11, 2006

Enclosure:

1. MFN 06-436 Supplement 1 - Response to Portion of NRC Request for Additional Information Letter No. 79 - Related to ESBWR Design Certification Application - Containment Systems - RAI Number 6.2-118 S01

cc:	AE Cubbage	USNRC (with enclosures)
	GB Stramback	GEH/San Jose (with enclosures)
	RE Brown	GEH/Wilmington (with enclosures)
	eDRF	0000-0072-8507

Enclosure 1

MFN 06-436 Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 79

Related to ESBWR Design Certification Application

Containment Systems

RAI Number 6.2-118 S01

NRC RAI 6.2-118:

DCD Tier 2, Revision 1, Section 6.2.4.3.1.1, "Influent Lines," under the heading "Feedwater Line," describes the design of a spring-check valve as follows:

The spring-check valve outside containment is provided with an air-opening, spring-closing operator, which, upon remote manual signal from the main control room, provides additional seating force on the valve disk to assist in long-term leakage protection. Should a break occur in the feedwater line, the check valves prevent significant loss of reactor coolant inventory and offer immediate isolation.

The details of the spring-check valve's operation are unclear. For example, if the valve uses air to open, and remote-manual action provides additional seating force (from the spring, presumably), does this mean that the valve is normally held open by air? If so, how can the valve close immediately during an accident?

Provide more description of the spring-check valve's operation, especially of its remote manual operation.

GEH Response:

The valve is a spring assisted positive acting swing check valve and is equipped with a solenoid valve and a pneumatic actuator. When the solenoid valve is energized by remote manual operation, air pressure is supplied to the under side of the piston of the actuator. The air pressure under the piston compresses a spring inside the actuator, which disengages the actuator shaft from the valve disc swing arm and allows the valve to operate as a swing check valve. During normal operation, the valve disc opens and is held open due to flow of fluid through the valve and a differential pressure across the disc in the normal direction of flow. When there is no flow in the feedwater line, the disc closes. During an accident, the valve disc closes and is held closed upon loss of flow in the normal direction or a reverse flow condition. When the solenoid valve is deenergized by remote manual operation, air pressure is released from the under side of the piston of the actuator, which decompresses the spring in the actuator. Decompression of the spring allows the actuator shaft to engage with the valve disc swing arm, which assists the disc in closing and applies an additional seating force on the disc.

DCD Impact:

No DCD changes will be made in response to this RAI.

NRC RAI 6.2-118 S01:

In DCD, Tier 2, Revision 3, Section 6.2.4.3.1.1, "Influent Lines," under the heading "Feedwater Line," the third sentence states:

Additionally, two valves with automatic power-actuated closure, including the outboard containment isolation valve, automatic power-actuated closure, including the outboard containment isolation valve.

Please correct this sentence in the DCD.

GEH Response:

The sentence will be revised to read, as originally intended, "Additionally, two valves with automatic power-actuated closure, including the outboard isolation valve, isolate the line in the event of an inboard feedwater pipe rupture (feedwater LOCA)."

DCD Impact:

DCD, Tier 2, Subsection 6.2.4.3.1.1, will be revised as shown in the attached markup.

6.2.4.3.1.1 Influent Lines

GDC 55 states that each influent line, which penetrate the containment directly to the RCPB, be equipped with at least two isolation valves, one inside the containment and the other as close to the external side of the containment as practical. Table 6.2-13 lists the influent pipes that comprise the RCPB and penetrate the containment. The table summarizes the design of each line as it satisfies the requirements imposed by General Design Criterion 55.

Feedwater Line

The feedwater line is part of the reactor coolant pressure boundary as it penetrates the containment to connect with the reactor pressure vessel. It has two containment isolation valves with process-actuated closure to isolate the line in the event of an outboard feedwater pipe rupture (feedwater HELB). Additionally, two valves with automatic power-actuated closure, including the outboard containment isolation valve, ~~automatic power-actuated closure, including the outboard containment isolation valve~~isolate the line in the event of an inboard feedwater pipe rupture (feedwater LOCA). The isolation valve inside the containment is a check valve, located as close as practicable to the containment wall. Outside the containment is a non-simple check valve located as close as practicable to the containment wall. The non-simple check valve outside containment is provided with powered actuation that, upon an automatic or remote manual signal from the main control room, provides closure force to the valve disk for isolation. An additional POV with automatic closure is provided upstream of the outboard containment isolation valve as a redundant backup valve for feedwater isolation for the LOCA event.