



HITACHI

GE Hitachi Nuclear Energy

James C. Kinsey
Vice President, ESBWR Licensing

PO Box 780 M/C A-55
Wilmington, NC 28402-0780
USA

T 910 675 5057
F 910 362 5057
jim.kinsey@ge.com

MFN 07-592, Supplement 3

Docket No. 52-010

November 28, 2007

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555-0001

Subject: **Response to Portion of NRC Request for Additional Information Letter No. 103 Related to ESBWR Design Certification Application - Heating, Ventilation, and Air Conditioning - RAI Number 9.4-39**

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 July 23, 2007, Reference 1. GEH response to RAI Number 9.4-39 is addressed in Enclosure 1.

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

Sincerely,

Kathy Sedney for

James C. Kinsey
Vice President, ESBWR Licensing

*DOGB
NRO*

Reference:

1. MFN 07-414, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, Senior Vice President, Regulatory Affairs, *Request For Additional Information Letter No. 103 Related To ESBWR Design Certification Application*, dated July 23, 2007

Enclosure:

1. Response to Portion of NRC Request for Additional Information Letter No. 103 Related to ESBWR Design Certification Application - Heating, Ventilation, and Air Conditioning - RAI Number 9.4-39

cc: AE Cabbage USNRC (with enclosure)
GB Stramback GEH/San Jose (with enclosure)
RE Brown GEH/Wilmington (with enclosure)
eDRF 0000-0076-3520

Enclosure 1

MFN 07-592, Supplement 3

Response to Portion of NRC Request for

Additional Information Letter No. 103

Related to ESBWR Design Certification Application

Heating, Ventilation, and Air Conditioning

RAI Number 9.4-39

NRC RAI 9.4-39

DCD Section 19A.8.4.10, Tier 2, states that component cooling will be performed by the HVAC systems in the Reactor Building, Electrical Building, Fuel Building, Control Building, and parts of the Turbine Building.

- A. Please identify which components in the Reactor Building HVAC System (RBVS) are RTNSS qualified. Please discuss how the RBVS or its sub-system would be used in the post 72-hour period and identify areas of the Reactor Building or equipment which require ventilation or cooling. Is there any impact on the control of the release of radioactivity by using the RBVS in the post 72-hour period that could be caused by opening building isolation dampers, discharging to the stack, or discharging to the Contaminated Air Ventilation System (CONAVS).*
- B. Please identify which components in the Electrical Building HVAC System (EBVS) are RTNSS qualified. Please discuss how the EBVS or its sub-system would be used in the post 72-hour period and identify areas of the Electrical Building or equipment which require ventilation or cooling.*
- C. Please identify which components in the Fuel Building HVAC System (FBVS) are RTNSS qualified. Please discuss how the FBVS or its sub-system would be used in the post 72-hour period and identify areas of the Fuel Building or equipment which require ventilation or cooling. Is there any impact on the control of the release of radioactivity by using the FBVS in the post 72-hour period that could be caused by opening building isolation dampers, discharging to the stack, or discharging to the Contaminated Air Ventilation System (CONAVS).*
- D. Please identify which components in the Control Building HVAC System (CBVS) are RTNSS qualified. Please discuss how the CBVS or its sub-system would be used in the post 72-hour period and identify areas of the Control Building or equipment which require ventilation or cooling. Is there any impact on the control of the release of radioactivity by using the CBVS in the post 72-hour period that could be caused by opening building isolation dampers, discharging to the stack, or discharging to the Contaminated Air Ventilation System (CONAVS).*
- E. Please identify which components in the Turbine Building HVAC System (TBVS) are RTNSS qualified. Please discuss how the TBVS or its sub-system would be used in the post 72-hour period and identify areas of the Turbine Building or equipment which require ventilation or cooling.*

GEH Response

- A. The RTNSS qualified subsystems within the Reactor Building HVAC System (RBVS) are the Clean Area HVAC Subsystem (CLAVS) and Contaminated Area HVAC Subsystem (CONAVS) including the system fans, dampers, and ductwork.*

Both subsystems support the RTNSS post 72-hr function to provide cooling for the DCIS cabinets and their electrical supporting equipment. Critical heat generating areas served by these subsystems will be equipped with room or cabinet coolers scoped under the respective subsystem. The room coolers are available with the building isolated or concurrent with the ventilation subsystems running.

There is no impact on the control of the radioactivity release because the building isolation dampers remain closed after a radiological event. Radiological conditions are assessed, and appropriate actions are taken prior to reopening the dampers.

- B. The RTNSS qualified subsystems within the Electrical Building HVAC System (EBVS) are those subsystems that provide cooling for the standby diesel generators and their applicable electric and electronic equipment. These systems include the Electric and Electronic Rooms (EER) HVAC Subsystem (EERVS) and Diesel Generators (DG) HVAC Subsystem (DGVS). The Electrical Building HVAC System also supports the RTNSS function of maintaining electrical power to FAPCS. System components designated as RTNSS include the system fans, dampers, and ductwork necessary to perform this function. During the post 72-hr period, ventilation subsystems are restarted to provide ventilation and cooling to the EBVS.

- C. The RTNSS qualified subsystem within Fuel Building HVAC System (FBVS) is the Fuel Building General Area HVAC Subsystem (FBGAVS) that provides cooling for Fuel and Auxiliary Pools Cooling System (FAPCS) and its supporting equipment. System components designated as RTNSS include the system fans, dampers, and ductwork necessary to perform this function. During the post 72-hour period, cooling is provided for FAPCS pump motors, rooms, and/or electrical/instrument panels designed to limit the room/equipment's environmental qualification temperature when the building is isolated. The ventilation subsystems are restarted to provide once-thru ventilation / cooling provided there are no radiological conditions present.

There is no impact on the control of the radioactivity release because the building isolation dampers remain closed after a radiological event until radiological conditions are assessed; appropriate actions are taken prior to opening the building isolation dampers.

- D. The RTNSS function supported by the Control Room HVAC System (CRVS) is to provide post 72-hour cooling for DCIS and Control Room habitability. Subsystems supporting this RTNSS function are the CRHAVS (Control Room Habitability Area Ventilation System) and the CRGAVS (Control Room General Area Ventilation System). The CRGAVS provides cooling for the electronic equipment of Control Room and cooling the Control Room Habitability Area (CRHA). This includes providing cooling for the DCIS cabinets and their electrical supporting equipment. The CRHAVS also provides filtered ventilation to the CRHA envelope (for fresh air

and maintaining the positive pressure) via the CRHA Emergency Filter Units and their fans. This is accomplished using a dedicated portable RTNSS generator once the station batteries are depleted. If the standby diesel generators are available in the pre- or post-72 hour timeframe, then cooling is provided by the normal CRVS subsystems. The CRVS has no interaction with the CONAVS subsystem. The CRVS does not house any equipment that can act as a source of radioactive material so unisolating the CRVS after an accident poses no radioactive release hazard.

- E. The RTNSS qualified subsystems within the Turbine Building HVAC System (TBVS) are the subsystems that provide cooling for the RTNSS supporting systems: room cooling for the Reactor Component Cooling Water System (RCCWS) equipment rooms inside the Turbine Building; Chilled Water System (CWS) equipment rooms that house the RTNSS portion of the CWS; and, for cooling the rooms that house the electric and electronic equipment supporting the CWS RTNSS portions and RCCWS. The TBVS supports the RTNSS function to provide post 72-hour cooling for DCIS in the Turbine Building. The aforementioned area rooms are served by the TBVS, which includes fans, dampers and ductwork necessary to perform this function. The RCCW and NICWS pump rooms are to be equipped with room coolers that can provide cooling with or without the main ventilation system in service.

For all above cases see DCD Tier 2 Appendix 19A for further and detailed information regarding to RTNSS requirements.

For detailed information regarding the above subsystems see DCD Tier 2 Section 9.4: Subsection 9.4.1 for CBVS; Subsection 9.4.2 for FBVS; Subsection 9.4.4 for TBVS; Subsection 9.4.6 for RBVS; and, Subsection 9.4.7 for EBVS.

DCD Impact

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