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MFN 08-775
Supplement 1

Docket No. 52-010

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Subject: Response to Portion of NRC RAI Letter No. 220 Related to ESBWR
Design Certification Application - DCD Tier 2 Section 3.9 – Mechanical
Systems and Components; RAI Number 3.9-205

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) letter number 220 sent by NRC letter dated July 29, 2008 (Reference 1). RAI Number 3.9-205 is addressed in Enclosure 1.

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

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

DD68
NRC

Reference:

1. MFN 08-609 Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, GEH, *Request For Additional Information Letter No. 220 Related to NEDE-33312P, "ESBWR Steam Dryer Acoustic Load Definition," NEDE-33313P, "Steam Dryer Structural Evaluation," NEDC-33408P, "ESBWR Steam Dryer-Plant Based Load Evaluation Methodology," NEDE-33259P, "Reactor Internals Flow Induced Vibration Program," and ESBWR Design Control Document, Revision 5*, dated July 29, 2008

Enclosure:

1. Response to Portion of NRC RAI Letter No. 220 Related to ESBWR Design Certification Application - DCD Tier 2 Section 3.9 – Mechanical Systems and Components; RAI Number 3.9-205

cc: AE Cubbage
RE Brown
DH Hinds
eDRF

USNRC (with enclosures)
GEH/Wilmington (with enclosures)
GEH/Wilmington (with enclosures)
0000-0091-9929(RAI 3.9-205)

Enclosure 1

MFN 08-775, Supplement 1

Response to Portion of NRC Request for

Additional Information Letter No. 220

Related to ESBWR Design Certification Application

Mechanical Systems and Components

RAI Numbers 3.9-205

NRC RAI 3.9-205

Question Summary: Provide rationale for change in steam dome geometry from ABWR.

In Report NEDE-33312P GEH opts to maintain the geometry of the Economic Simplified Boiling Water Reactor (ESBWR) dryer similar to that of the Advanced Boiling-Water Reactor (ABWR). However, the steam dome of the ABWR is hemispherical, whereas that of the ESBWR is torispherical, which will result in different flow patterns in the steam dome region. Provide the rationale for the change in the steam dome geometry from hemispherical, as in BWRs and ABWRs, to torispherical geometry.

GEH Response

Selecting a torispherical instead of a hemispherical reactor vessel head was made for economical reasons. This is because the torispherical head has a lower height. As the vessel head has to be lifted up on the refueling floor during refueling and maintenance of the reactor, the torispherical head allows a reduction in the crane height, and thereby a reduction in the reactor building height.

This difference in geometry and the corresponding impact of steam flow patterns have been evaluated, and the torispherical head provides sufficient space for the steam flow to be directed to the steam nozzle without any appreciable change in the operational forces on the steam dryer as compared to prior BWRs.

DCD Impact

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