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**Subject: Response to Portion of NRC Request for Additional Information
Letter No. 229 - Related To Design Control Document (DCD)
Revision 5 – RAI Number 4.2-29**

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 the Reference 1 NRC letter. GEH response to RAI Number 4.2-29 is addressed in Enclosure 1. DCD markups associated with this response are provided in Enclosure 2.

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

Sincerely,

Richard E. Kingston
Vice President, ESBWR Licensing

D068
NRD

Reference:

1. MFN 08-611, Letter from U.S. Nuclear Regulatory Commission to Robert E. Brown, *Request For Additional Information Letter No. 229 Related To Design Control Document (DCD) Revision 5*, dated July 30, 2008.

Enclosure:

1. MFN 08-849 – Response to Portion of NRC Request for Additional Information Letter No. 229 - Related To Design Control Document (DCD) Revision 5 – RAI Number 4.2-29
2. MFN 08-849 – Response to Portion of NRC Request for Additional Information Letter No. 229 - Related To Design Control Document (DCD) Revision 5 – RAI Number 4.2-29 – DCD Markup Pages

cc: AE Cabbage USNRC (with enclosures)
RE Brown GEH/Wilmington (with enclosures)
DH Hinds GEH/Wilmington (with enclosures)
eDRF 0000-0092-5291

Enclosure 1

MFN 08-849

**Response to Portion of NRC Request for
Additional Information Letter No. 229
Related to ESBWR Design Certification Application
RAI Number 4.2-29**

NRC RAI 4.2-29

Tier 2 for Fuel Design Criteria*

The principle fuel design requirements added to ESBWR DCD Revision 5, Tier 2, Section 4B.1 (formerly Tier 1 design requirements) should be designated Tier 2. Similarly, Figure 4.1-1 should be designated Tier 2*.*

GEH Response

ESBWR DCD Tier 2, Section 4B.1 (formerly Tier 1 design requirements) will be designated Tier 2*.

DCD Tier 2, Figure 4.1-1 will not be designated Tier 2*, because Tier 1 Figure 2.1.1-2 includes the essential core design elements. DCD Tier 2, Figure 4.1-1 will be updated for consistency throughout the DCD.

DCD Impact

DCD Tier 2, Section 4B.1 and Figure 4.1-1 will be revised as shown in the Enclosure 2 markups.

Enclosure 2

MFN 08-849

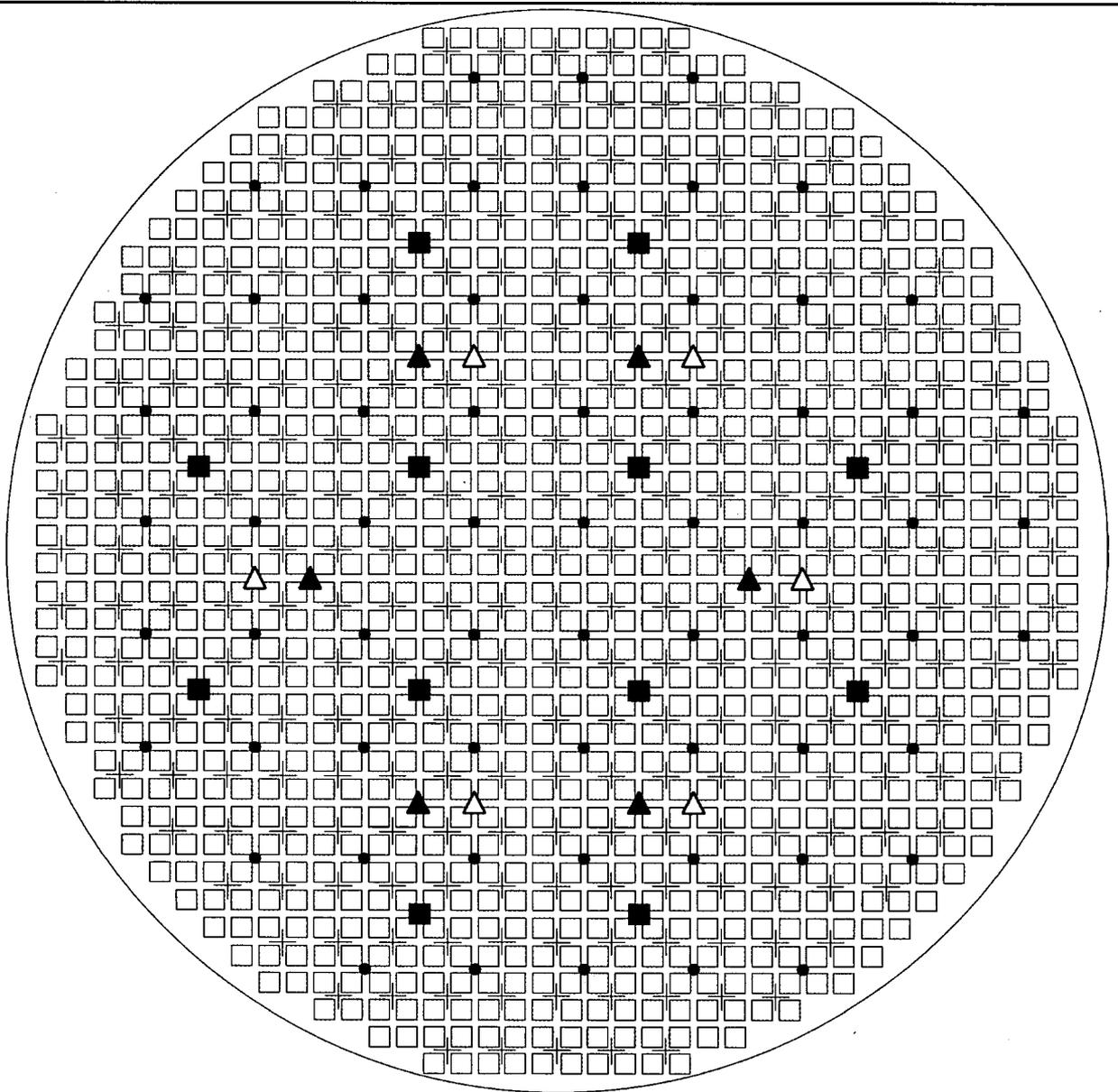
Response to Portion of NRC Request for

Additional Information Letter No. 229

Related to ESBWR Design Certification Application

RAI Number 4.2-29

DCD Markup Pages



□ Fuel Bundle Locations	1132	+ Control Rod Locations	269
■ SRNM Channels	12	● LPRM	64
▲ Neutron Sources	6	△ Spare Sources Locations	6

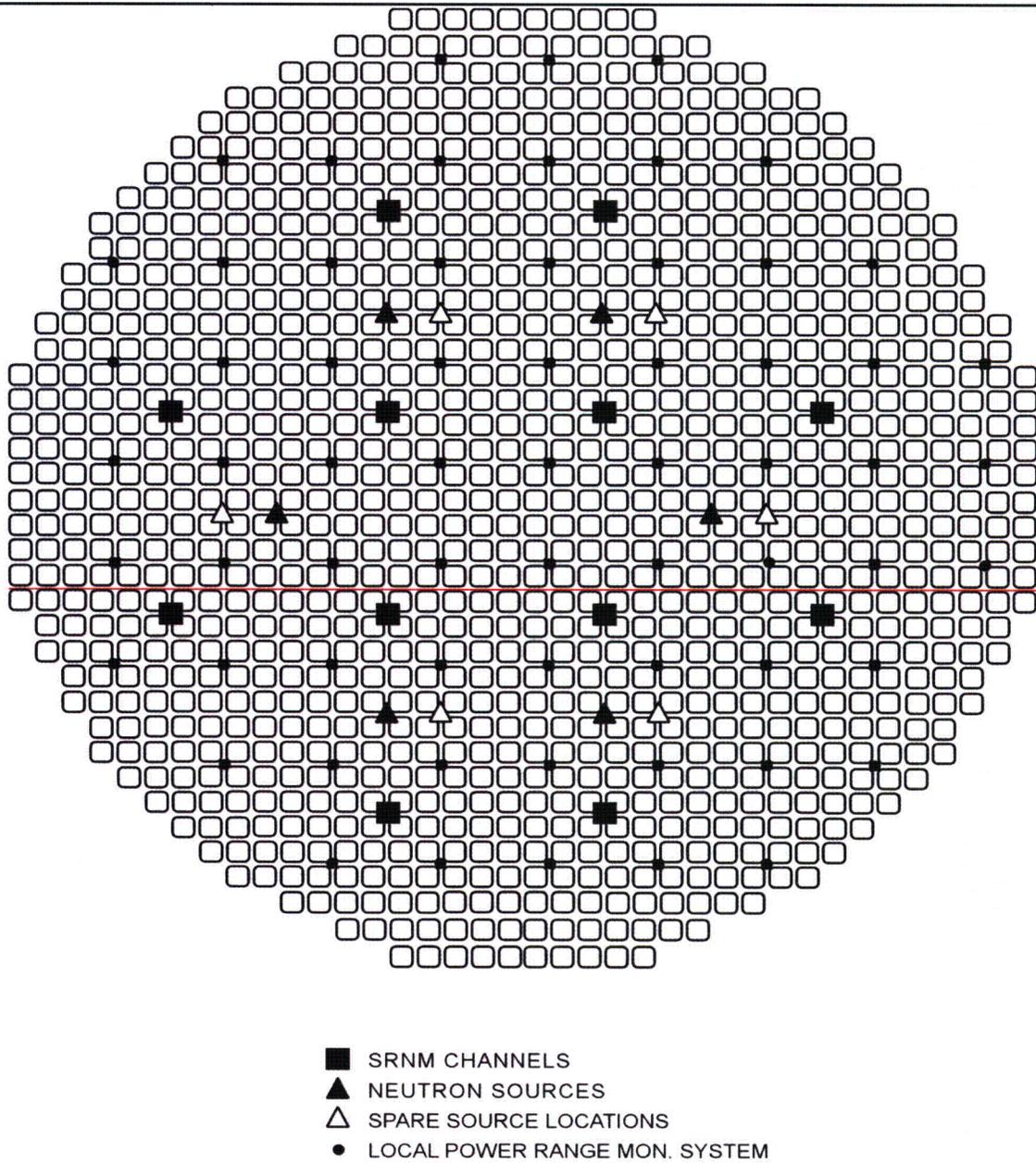


Figure 4.1-1. ~~Core Configuration with Location of Instrumentation~~ Fuel Bundle, Neutron Sources, Neutron Detectors and Control Rod Arrangement

4B. FUEL LICENSING ACCEPTANCE CRITERIA

The fuel licensing acceptance criteria are presented in the following subsections.

4B.1 GENERAL CRITERIA

The following is a summary of the principal requirements, which must be met by the fuel supplied to any facility utilizing the certified design.

- *[Fuel rod failure is predicted to not occur as a result of normal operation and anticipated operational occurrences.*
- *Control rod insertion will not be prevented as a result of normal operation, anticipated operational occurrences or postulated accident.*
- *The number of fuel rod failures will not be underestimated for postulated accidents.*
- *Coolability will be maintained for all design basis events, including seismic and LOCA events.*
- *Specified acceptable fuel design limits (thermal and mechanical design limits) will not be exceeded during any condition of normal operation, including the effects of anticipated operational occurrences.*
- *In the power operating ranges, the prompt inherent nuclear feedback characteristics will tend to compensate for a rapid increase in reactivity.*
- *The reactor core and associated coolant, control and protection systems will be designed to assure that power oscillations which can result in conditions exceeding specified acceptable fuel design limits are not possible or can be reliably and readily detected and suppressed.]**

The following is a summary of the principal requirements, which must be met by the fuel channel supplied to any facility using the certified design:

- *[During any design basis events including the mechanical loading from safe shutdown earthquake event combined with LOCA event, fuel channel damage will not be so severe as to prevent control rod insertion when it is required.*
- *Coolability will be maintained for all design basis events.*
- *Channel bowing will not cause specified acceptable fuel design limits to be exceeded during normal operation and anticipated operational occurrences.]**

4B.2 THERMAL-MECHANICAL

A set of design limits are defined, and applied in the fuel rod thermal-mechanical design analyses, to ensure that fuel rod mechanical integrity is maintained throughout the fuel rod design lifetime. The design criteria were developed by Global Nuclear Fuel (GNF) and other specific industry groups to focus on the parameters most significant to fuel performance and operating occurrences that can realistically limit fuel performance. The specific criteria are patterned after ANSI/ANS-57.5-1981 (Reference 4B-1) and Standard Review Plan 4.2, Fuel