



GE Energy

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MFN 06-511

Docket No. 52-010

December 14, 2006

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. 66 – Fuel Design – RAI Number 4.2-13**

Enclosure 1 contains GE's response to the subject NRC RAIs transmitted via the Reference 1 letter.

If you have any questions about the information provided here, please let me know.

Sincerely,

A handwritten signature in cursive script that reads "David H. Hinds for".

David H. Hinds
Manager, ESBWR

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Reference:

1. MFN 06-377, Letter from U.S. Nuclear Regulatory Commission to David Hinds, *Request for Additional Information Letter No. 66 Related to ESBWR Design Certification Application*, October 10, 2006

Enclosure:

1. MFN 06-511 – Response to Portion of NRC Request for Additional Information Letter No. 66 – Fuel Design – RAI Number 4.2-13

cc: AE Cabbage USNRC (with enclosures)
GB Stramback GE/San Jose (with enclosures)
eDRF 0062-0080

Enclosure 1

MFN 06-511

Response to Portion of NRC Request for

Additional Information Letter No. 66

Related to ESBWR Design Certification Application

Fuel Design

RAI Number 4.2-13

NRC RAI 4.2-13:

Question Summary: Clarification on Tier 1 fuel design requirements.

Reviewer Summary: DCD Tier 1, Rev. 1, Section 2.8 defines six principal requirements. Provide clarification on whether these six requirements are, in fact, Tier 1 fuel design requirements. Note that the licensing approach for these ESBWR requirements appears to differ from the ABWR DCD Tier 1, Section 2.8.1 design requirements.

GE Response:

Based on recent discussion with NRC, GE has concluded that the seven design requirements in the ABWR DCD Tier 1 better fit the definition of Tier 1. Therefore Subsection 2.8.1 of the Tier 1 ESBWR DCD will be revised to use the following requirements for the Fuel Design:

- (1) Fuel rod failure is predicted to not occur as a result of normal operation including anticipated operational occurrences.
- (2) Control rod insertion will not be prevented as a result of normal operation, anticipated operational occurrences or postulated accident.
- (3) The number of fuel rod failures will not be underestimated for postulated accidents.
- (4) Coolability will be maintained for all design basis events, including seismic and LOCA events.
- (5) 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.
- (6) In the power operating ranges, the prompt inherent nuclear feedback characteristics will tend to compensate for a rapid increase in reactivity.
- (7) 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.

Also, GE has concluded that the requirements in Subsection 2.8.2 of the ABWR DCD are better suited for the Tier 1 Fuel Channel requirements. Therefore, Subsection 2.8.2 of the ESBWR Tier 1 DCD will be revised to use the following requirements:

- (1) 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.
- (2) Coolability will be maintained for all design basis events.
- (3) Channel bowing will not cause specified acceptable fuel design limits to be exceeded during normal operation, including anticipated operational occurrences.

DCD Impact:

Subsections 2.8.1 and 2.8.2 of the ESBWR Tier 1 DCD will be revised as noted above.