

Enclosure 1

MFN 15-037

GEH Response to RAI 07-1

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NRC Request for Additional Information 07-1:

10 CFR 52.59(a) requires, in pertinent part, a finding of compliance with the regulations in effect at the time of original certification in order to issue a renewed design certification. As required by the regulations in effect at the time the ABWR DC was originally issued, the ABWR DC application must contain [t]he technical information which is required of applicants for construction permits and operating licenses by 10 CFR part 20, part 50 and its appendices, and parts 73 and 100, and which is technically relevant to the design and not site-specific." 10 CFR 52.47(a)(1)(i) (1997). In 1997, operating license Final Safety Analysis Reports (FSARs) were required to comply with 10 CFR Part 50, Appendix A, General Design Criteria (GDC) 28, "Reactivity limits," (1997) which states, in part, "[t]he reactivity control systems shall be designed with appropriate limits on the potential amount and rate of reactivity increase to assure that the effects of postulated reactivity accidents can neither (1) result in damage to the reactor coolant pressure boundary greater than limited local yielding nor (2) sufficiently disturb the core, its support structures or other reactor pressure vessel internals to impair significantly the capability to cool the core." The NRC interprets this requirement to mean that the control rod patterns for reactor startup are to be evaluated and designed with appropriate limits to prevent large reactivity worth steps.

ABWR DCD FSAR Tier 2, Section 7.7.1.2.1(5)(b)(iii), Revision 5, states, "Groups 1-4 may only be withdrawn before groups 5–10 are in the full-in position." If the ganged withdrawal sequence is performed as described in the FSAR section cited above, the ganged control rod sequence steps could create a potentially unsafe operating condition through inappropriate limits on the amount and rate of reactivity increase. These actions could unnecessarily challenge the reactor protection systems, and could potentially cause neutron flux levels and energy releases sufficient to disturb the core, its support structures or other reactor pressure vessel internals to impair significantly the capability to cool the core. Generally in a boiling water reactor (BWR), groups 1-4 control rods are withdrawn in significant portions of the rod travel length with each sequence step when the reactor core is far from critical and only if groups 5-10 are in the full-in position. This will not be the case if groups 5-10 are not full-in when groups 1-4 are withdrawn. Reactivity rod worth of the rods in groups 1-4 would very likely be significantly higher than when groups 5-10 are still full-in, making it more difficult for the reactor operator to control the approach to criticality and increasing the potential of challenging safety systems unnecessarily. Therefore, the ganged withdrawal sequence, as described in ABWR DCD, Tier 2, Section 7.7.1.2.1(5)(b)(iii), does not appear to comply with GDC 28 and, as currently written, appears to be contrary to generally accepted BWR operating practices. The staff notes that the language in Section 7.7.1.2.1(5)(b)(iii) may have been the result of an inadvertent error.

Therefore, in accordance with 10 CFR 52.59 (2014), 10 CFR 52.47(a)(1)(i) (1997), and 10 CFR Part 50, Appendix A, GDC 28 (1997):

1. *Correct the ganged withdrawal sequence description in Section 7.7.1.2.1(5)(b)(iii) or provide a technical basis and further explanation as to why this section, as currently written, is correct and accurate.*

GEH Response to RAI 07-1:

GEH has reviewed the wording used in Section 7.7.1.2.1(5)(b)(iii) and commits to change the text as follows:

“Groups 1-4 must be fully withdrawn before groups 5-10 can be withdrawn from the full-in position.”

Impact on DCD

The ABWR DCD text and Figure that are modified/added to implement this commitment are:

- Tier 2 subsection 7.7.1.2.1(5)(b)(iii)

The ABWR DCD R5 page markup is attached in Enclosure 2.