

Enclosure 1

MFN 15-067

GEH Response to Item #21 – Obsolete Communication Technology

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NRC Suggested Design Change Item #21 – Obsolete Communication Technology

Replace obsolete data communication technology. The replacement design should conform to current instrumentation and control related regulations, industry standards, and regulatory guidance.

GEH's Response:

In Reference 1, the NRC requested that GEH consider certain design changes that could be included in the Advanced Boiling-Water Reactor (ABWR) design certification renewal application.¹ For Item 21, the NRC suggested design changes to replace obsolete data communication technology, indicating that the replacement design should conform to current instrumentation and control (I&C) related regulations, industry standards, and regulatory guidance. In Reference 2, GEH described how Item 21 would be addressed in the renewal application. The NRC provided further clarification regarding Item 21 in a meeting held on May 7, 2015. GEH has considered the suggested design changes and the NRC comments during the May 7, 2015 meeting and, for the reasons set forth below, considers the ABWR design certification requirements for data communication technology sufficient for NRC approval of the GEH ABWR certification renewal application.

The NRC describes in its Final Safety Evaluation (FSER) for the ABWR Design Certification Rule (DCR) that, for the microprocessor and digital control technology aspects of the I&C system design of the ABWR, GE did not provide complete design information in the SSAR "because the technology in this area is rapidly evolving and it is, therefore, important that the certified design description and ITAAC [inspections, tests, analyses, and acceptance criteria] not 'lock in' a design which could be obsolete at the time of construction." The NRC notes that the ITAAC provide acceptance criteria for verifying the design while the ABWR standard safety analysis report provides the set of guidelines and standards with more detailed criteria for development of the design.

GEH agrees with the NRC assessment of the rapidly evolving nature of I&C technology in its FSER for the ABWR DCR and GEH fully intends to consider technological improvements in any future detailed design implementation of the ABWR design requirements, as data communication technology is expected to continue to evolve. The ABWR data communications design is defined in the ABWR design certification as being based on fiber optic communication links and a fiber distributed data interface (FDDI) protocol, a technology that has been successfully implemented in nuclear power plants (Reference 3), and continues to be supported by suppliers of the equipment and controls. Business continuity practices encourage the use of contemporary, but proven, technologies in applications as long as functional requirements and acceptance criteria are met. As recently as September 2010, a study conducted for the NRC to assess secure network design techniques for safety system applications at nuclear power plants evaluated the FDDI communication protocols, as described in the ABWR design certification, as a potential use for safety system design, (Reference 4).

¹ The NRC suggested that the design changes listed in the letter were considered to be regulatory improvements or changes that could meet the 10 CFR 52.59(b) criteria, which provide, in brief, that the Commission may impose requirements that it determines are necessary for adequate protection, are necessary for compliance with NRC regulations and orders applicable and in effect at the time the design certification was issued, or that there is a substantial increase in overall protection of public health and safety or common defense and security and costs are justified. In the final rulemaking for adding Part 52 to its regulations, the NRC specifically adjusted the renewal provisions for design certifications in the proposed rule based on public comments, agreeing that the Commission would grant a request for renewal of a design certification if the design complied with regulations in effect at the time the certification was originally issued, together with any other more stringent requirement which are justified under the backfit rule.

The ABWR certified design material (Tier 1) includes (1) design descriptions that provide functional requirements of the processes and (2) acceptance criteria by which the details of the design of the ABWR I&C system would be developed, designed, and evaluated. ITAAC verify, through inspections, tests, and acceptance criteria, that the as-built system conforms to the design description of the communications protocol, performance criteria, and functions. Following these requirements and criteria as part of a future ABWR project will allow consideration of the evolutions in digital I&C communication technology at that time, as the NRC envisioned in the FSER, including the design described in the ABWR DCR. No changes to the renewal application are proposed at this time.

References:

1. Letter from USNRC to Jerald G. Head, GEH, Subject: GE-Hitachi Nuclear Energy – United States Advanced Boiling-Water Reactor Design Certification Renewal Application, July 20, 2012 (ML12125A385)
2. Letter from GEH to USNRC, Subject: NRC Review of GE Hitachi Nuclear Energy – United States Advanced Boiling Water Reactor (ABWR) Design Certification Renewal Application – Submittal Date for ABWR DCD Revision 6, March 17, 2012 (ML14078A070)
3. NUREG/CR-6991, “Design Practices for Communications and Workstations in Highly Integrated Control Rooms,” September 2009, (ML092740566).
4. Secure Network Design Techniques for Safety System Applications at Nuclear Power Plants, (ML12250A812)

Impact on the DCD

No changes were made to the DCD as a result of this response to NRC Item #21.