



**HITACHI**

**GE Hitachi Nuclear Energy**

**Dale E. Porter**

GE-Hitachi Nuclear Energy Americas  
LLC  
Safety Evaluation Program Manager

3901 Castle Hayne Rd.,  
Wilmington, NC 28401  
USA

T 910 819-4491

October 11, 2010  
MFN 10-321

Docket 52-001  
10 CFR Part 21

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555-0001

**Subject: U.S. ABWR Turbine Building Design Requirements**

**Reference: Fluor Enterprises, Inc. to NRC, "U.S. Advanced Boiling Water Reactor Design Certification Design Input Requirements for Main Steam Line Seismic Analysis" (August 30, 2010)**

This letter provides information concerning an evaluation performed by GE Hitachi Nuclear Energy (GEH) regarding the Main Steam Line Seismic Analysis design requirements specified in the ABWR Design Certification Document (DCD). GEH has reviewed both the ABWR certified design and the information provided by Fluor Structural Engineering to determine if the ABWR certified design contains a defect that would be reportable in accordance with 10CFR Part 21. While we did not find the identified concern met the requirements for being reportable under 10CFR Part 21, the following information is being provided to assist the NRC staff in their assessment of the issue.

ABWR DCD Section 3.2.5.3 describes two seismic requirements for the turbine building to ensure that the ABWR main steam line leakage path (main steam piping, bypass line, and condenser), used to mitigate the consequences of an accident, remains functional during and after a Safe Shutdown Earthquake:

Dynamic input loads for the design of the main steamlines in the turbine building are derived as follows: For locations on the basemat, the ARS [acceleration response spectrum] shall be based upon Regulatory Guide 1.60 Response spectra normalized to 0.6g (i.e., 2 times ARS of the site envelope). For locations at the operating deck level (either operating deck or turbine deck), the ARS used shall be the same as used at the reactor building end of the main steam tunnel. Seismic Anchor motions shall be similarly calculated.

The first requirement in Section 3.2.5.3 is essentially that the turbine building foundation response spectra used to evaluate the condenser (which is part of the main steam line leakage path) be equal to twice the Reactor Building foundation response spectra at the basemat. The second requirement is essentially that the Reactor Building response spectra at Elevation 23500 mm will bound the response spectra in the Turbine Building, ensuring adequacy of the main steam line supports in the Turbine Building.

These two requirements constitute constraints on the design of the ABWR turbine building and are met by the GE turbine building design described in the ABWR DCD, which utilizes reinforced concrete construction from the basemat to the operating deck and uses shear walls to provide lateral support. Any departure from that design and construction technique, in accordance with 10 CFR Part 52, Appendix A, Section VIII, would need to be carefully analyzed to ensure that those two critical design constraints are met.

If you have any questions, please call me at (910) 819-4491.

Sincerely,

A handwritten signature in black ink, appearing to read "Dale E. Porter", with a stylized flourish at the end.

Dale E. Porter  
Safety Evaluation Program Manager  
GE-Hitachi Nuclear Energy Americas LLC

cc: S. S. Philpott, USNRC  
S. J. Pannier, USNRC  
O. Tabatabai-Yazdi, USNRC  
A. Muniz, USNRC  
J. F. Harrison, GEH  
J. G. Head, GEH  
P. L. Campbell, GEH  
B. R. Johnson, GEH  
S. A. Hucik, GEH  
R. E. Kingston, GEH  
H. A. Upton, GEH