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April 18, 2002

Mr. Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
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11555 Rockville Pike  
Rockville, MD 20852-2738

Subject: Pre-application review of ESBWR

Dear Mr. Collins,

This letter is written to request a pre-application review of the General Electric Company reactor design – ESBWR. This review would be consistent with NUREG-1226 and would provide guidance on the Certification Application for the design. The ESBWR design is based on both the ABWR and SBWR designs. The ABWR design has a Final Design Approval and Design Certification and the SBWR had extensive review by the NRC. The ABWR is GE's current market offering with two units in operation in Japan since 1997 and four additional units under construction. It has certain economics and proven performance and reliability. The SBWR had some new features that offered the potential for design simplification but the overall plant economics were unfavorable at 670MWe and, therefore, the certification effort was suspended in 1996.

The ESBWR, rated at 4000 MWth (approximately 1380Mwe), has been developed over the last nine years, under the guidance of several utilities, to improve overall plant reliability and economics, and to achieve the full economic and performance potential of the SBWR design features. The plant is a boiling water reactor that uses passive safety systems and natural circulation for normal operation to achieve overall plant simplification. Over the last six years the program has been guided and supported by a Steering Committee consisting of utilities from Europe and the US. The US utility members are formally represented by EPRI and consist of the members of the Advanced Reactor Corporation. The steering committee at its last meeting (March 20, 2002) endorsed the idea of proceeding with the pre-application review.

The NRC's "Statement of Policy for Regulation of Advanced Nuclear Power Plants," July 8, 1986, encourages early discussions (prior to a license application) between NRC and reactor designers to provide licensing guidance. In June 1988, the NRC issued NUREG-1226, "Development and Utilization of the NRC Policy Statement on the Regulation of Advanced Nuclear Power Plants." This document provides guidance on the implementation of the policy and describes the approach used by NRC in its review of advanced reactor concepts. The NRC has conducted pre-application reviews of advanced reactor designs to identify (1) major safety issues that could require Commission policy guidance to the staff, (2) major technical issues that the staff could resolve under existing regulations or NRC policy, and (3) the research needed to resolve identified issues.

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Add: Jim Lyons  
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Certification of the ESBWR does not depend on any change of regulations. Hence the pre-application review of the ESBWR should focus on the last two items, i.e.

a. Under existing regulations, identification of technical issues that need to be addressed in the design certification submittals. Since the ESBWR is a light water reactor with passive safety systems, it is expected that the resolution of passive safety systems issues for the AP600 design certification would enable resolution of similar issues for the ESBWR.

b. Assessment of the research and testing completed in support of the design and the safety systems. The testing and qualification of the analytical methods (TRACG) used for the SBWR can be used directly for the ESBWR for the modest changes in the design and the higher power level. The ESBWR program has utilized the SBWR testing at different scales to confirm the scalability of the analytical methods. Additionally, the design has been improved to increase the margins for the safety systems. It is expected that the NRC would provide an assessment of the adequacy of the analytical methods and qualification programs.

It is expected that the review would be done in two phases, as for AP1000. During the first phase, the NRC would issue a letter report identifying the resources and schedule required for the completion of the Phase 2. The Phase 2 would provide the NRC estimate of resources and schedule required for Design Certification and would also identify the technical issues and an assessment of the technology basis for the design. It is expected that both phases will be completed in about 12 months.

GE looks forward to working with the Commission and the NRC staff to enable successful completion of the NRC pre-application review. C.J.Deacon, Manager Advanced Reactor Programs, will lead the GE technical team. He may be reached at 1- 408 925- 2649 or [Joe.Deacon@gene.ge.com](mailto:Joe.Deacon@gene.ge.com). Please could you inform us who the contact person would be on your staff for the follow-up actions.

With regards,



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General Manager Nuclear Plant Projects,  
GE Nuclear Energy

Cc: James Lyons, US NRC

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