



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS  
WASHINGTON, DC 20555 - 0001

**ACRSR-2244**

April 20, 2007

The Honorable Dale E. Klein  
Chairman  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**SUBJECT: TECHNOLOGY-NEUTRAL FRAMEWORK FOR FUTURE PLANT LICENSING**

Dear Chairman Klein:

In a November 8, 2006 Staff Requirements Memorandum, the Commission requested that the Advisory Committee on Reactor Safeguards (ACRS) "provide its views to the Commission with respect to staff's work on technology-neutral licensing framework with a focus on ensuring the value of such an approach versus the development of a licensing framework for specific designs, such as a high temperature gas cooled reactor or a liquid metal cooled reactor." During the 540<sup>th</sup> meeting of the ACRS, March 8-9, 2007, we met with the NRC staff and discussed the development of a technology-neutral licensing framework versus the development of a licensing framework for specific designs. The staff's technology-neutral licensing framework is documented in draft NUREG-1860, "Framework for Development of a Risk-Informed, Performance-Based Alternative to 10 CFR Part 50." Our Subcommittee on Future Plant Designs had previously reviewed this document on March 7, 2007. We continued our discussions during the 541<sup>st</sup> ACRS meeting, April 5-7, 2007. We had the benefit of the documents referenced.

### **RECOMMENDATIONS**

1. The staff should complete work on a technology-neutral framework rather than proceed with the development of technology-specific frameworks.
2. The completed framework should be tested on the Pebble Bed Modular Reactor (PBMR) design.

### **DISCUSSION**

The current regulations evolved over many years and addressed issues as they arose (a largely bottom-up approach). The prospect of applications for licensing non-light-water reactor designs presents an opportunity to produce a regulatory system that utilizes modern technology such as probabilistic risk assessment, incorporates lessons learned from the past, and is based on general principles (i.e., following a top-down approach). This top-down approach should be developed on a technology-neutral basis from which technology-specific requirements will be derived. This will ensure consistency among requirements for different designs and among requirements for a specific design, as well as make the intent of the regulations more transparent. Without a common technology-neutral framework, it will be necessary to develop a similar regulatory basis for each separate technology, an alternative that would be significantly less efficient. In the near term, an additional benefit would be derived for licensing

applications that use existing regulations with some modifications. These modifications could be guided by the technology-neutral framework.

The framework represents a major advancement in the development of a coherent risk-informed approach to establishing regulatory requirements for either future or current reactors. At this critical juncture, the staff should complete the framework. We look forward to continuing to work with the staff to resolve certain issues associated with the framework.

Pebble Bed Modular Reactor (Pty) Ltd. has submitted a number of white papers (References 3 through 6) that outline potential elements of an approach to certifying the PBMR design. Since the PBMR design also represents a significant departure from a light-water reactor design, it is a logical choice on which to test the completed framework.

Sincerely,

**/RA/**

William J. Shack  
Chairman

References:

1. Memorandum dated November 8, 2006, from Annette L. Vietti-Cook, Secretary, NRC, to John T. Larkins, Executive Director, ACRS, Subject: Staff Requirements — Meeting with Advisory Committee on Reactor Safeguards, 2:30 p.m., Friday, October 20, 2006, Commissioners' Conference Room, One White Flint North, Rockville, Maryland (Open to Public Attendance).
2. Memorandum dated April 3, 2007, from Farouk Eltawila, Director, Division of Risk Assessment and Special Projects, RES, to Frank P. Gillespie, Executive Director, ACRS, Subject: Transmittal of Proposed "Technology Neutral Framework" for Advisory Committee on Reactor Safeguards Review.
3. Letter dated June 13, 2006, from Edward G. Wallace, Senior General Manager - US Programs, PBMR (Pty) Ltd., to NRC Document Control Desk, Subject: PBMR White Paper: PRA Approach.
4. Letter dated July 3, 2006, from Edward G. Wallace, Senior General Manager - US Programs, PBMR (Pty) Ltd., to NRC Document Control Desk, Subject: PBMR White Paper: LBE Selection.
5. Letter dated August 28, 2006, from Edward G. Wallace, Senior General Manager - US Programs, PBMR (Pty) Ltd., to NRC Document Control Desk, Subject: PBMR White Paper: SSC Classification.
6. Letter dated December 13, 2006, from Edward G. Wallace, Senior General Manager - US Programs, PBMR (Pty) Ltd., to NRC Document Control Desk, Subject: PBMR White Paper: Defense-in-Depth Approach.

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