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

March 6, 2008

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

SUBJECT: REVIEW AND EVALUATION OF THE NRC SAFETY RESEARCH PROGRAM

Dear Chairman Klein:

During the 549th meeting of the Advisory Committee on Reactor Safeguards, February 7-9, 2008, we completed our review and evaluation of the reactor safety research sponsored by the NRC. Enclosed is an advance copy of the 2008 ACRS report entitled, "Review and Evaluation of the Nuclear Regulatory Commission Safety Research Program." The final report will be issued as NUREG-1635, Vol. 8.

Our report on the NRC reactor safety research program addresses primarily the shorter-term research activities undertaken by the NRC staff in support of the regulatory mission of the agency. As requested by the Commission in its November 8, 2006 Staff Requirements Memorandum (SRM), we have also provided recommendations and basis for areas in which the NRC should perform additional long-term research (see especially Chapter 3 of the enclosed report).

On February 5, 2008, our Subcommittee on Safety Research Program met with Jacques Repussard and Michel Schwarz representing France's Institut de Radioprotection et de Sûreté Nucléaire (IRSN), Carlo Vitanza representing the Nuclear Energy Agency (NEA) of the Organization for Economic Cooperation and Development (OECD), and Christer Viktorsson representing the Nuclear Installation Safety Division of the International Atomic Energy Agency (IAEA). This meeting was held to obtain international perspectives on long-term reactor safety research. In this regard, we had the benefit of written communications on the subject from S. Chande, Vice Chairman of the Atomic Energy Regulatory Board of India.

Our Subcommittee on Safety Research Program also met on December 18, 2007 to explore areas of longer-term research that NRC should consider. At this meeting, we had benefit of presentations by John Ahearne, former NRC Chairman, Alex Marion, Executive Director of Nuclear Operations and Engineering at the Nuclear Energy Institute, Tom Miller of the U.S. Department of Energy (DOE), and Robert Hill from Argonne National Laboratory representing the Department of Energy's Global Nuclear Energy Partnership (GNEP). During this meeting, we also had presentations from Brian Sheron, Director, Office of Nuclear Regulatory Research, and Gary Holohan, Deputy Director of the Office of New Reactors. We also had the benefit of a

Strategic Plan for light-water reactor research and development prepared for DOE and the Nuclear Industry[1].

Important points made by participants during our subcommittee meetings included:

- As noted especially by former NRC Chairman Ahearne, there needs to be confidence within the public that the agency has sufficient technical background and expertise to adequately review the safety of the more advanced reactor designs such as gas cooled or liquid-metal cooled designs. Without demonstrable expertise, there will be skepticism concerning the NRC's ability to deal with important safety issues.

- Research needed to establish expertise for the review of advanced reactor designs cannot be done in parallel with the certification reviews. Much of the expertise must be developed prior to submittal of applications and conduct of the review. In the absence of research results, regulatory actions will proceed along lines that may prove unnecessarily conservative or even incorrect.

- Within the current NRC prioritization process, it is difficult to initiate the needed long-term research to develop expertise in new reactor design technologies without user requests based on submittals of design certification applications.

- The development of new, advanced reactor design concepts is becoming an increasingly international undertaking. Many other nuclear safety institutions such as the IAEA and OECD-NEA as well as Technical Support Organizations such as IRSN for other regulatory bodies also recognize the need to develop expertise in advanced reactor design concepts. There is appetite for collaboration in doing this. It is unlikely that any one institution can undertake comprehensive coverage of all the needed areas of expertise. NEA, at the prompting of the NRC Office of Nuclear Regulatory Research, is undertaking a mapping of the technical areas of expertise that will be needed to evaluate the safety of advanced reactor designs.

- It was emphasized by all the international participants that safety authorities must have the ability to conduct selected evaluations of advanced reactors with independently developed computer codes. The participants noted also that it is difficult to maintain expertise in the absence of state-of-the-art analysis tools and access to relevant experimental facilities.

- A strong research program is a powerful tool for recruiting and retaining expert staff.

[1] **Strategic Plan for Light Water Reactor Research and Development - An Industry-Government Partnership to Address Climate Change and Energy Security**, INL/EXT-07-13543, Idaho National Laboratory, Idaho Falls, ID, November 2007.

It is clear that international collaborations offer opportunities to the NRC to develop over the longer term its capabilities in the areas of advanced reactor safety as well as the safety of allied technologies.

Sincerely,

/RA/

William J. Shack
Chairman

Enclosure:
As stated

It is clear that international collaborations offer opportunities to the NRC to develop over the longer term its capabilities in the areas of advanced reactor safety as well as the safety of allied technologies.

Sincerely,

/RA/

William J. Shack
Chairman

Enclosure:
As stated

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