

February 6, 2002

MEMORANDUM TO: Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Martin J. Virgilio, Director  
Office of Nuclear Material Safety and Safeguards

Hubert J. Miller, Regional Administrator  
RGN - I

Luis A. Reyes, Regional Administrator  
RGN - II

James E. Dyer, Regional Administrator  
RGN - III

Ellis W. Merschoff, Regional Administrator  
RGN - IV

FROM: Ashok C. Thadani, Director **/RA/**  
Office of Nuclear Regulatory Research

SUBJECT: CALL FOR ANTICIPATORY RESEARCH PROJECTS

As a result of recent reviews of the research program by the ACRS and the Expert Panel headed by former Commissioner Rogers, we are seeking recommendations or proposals for anticipatory research both from within NRC and from external stakeholders that will help NRC prepare for current challenges and regulatory issues anticipated in the future. We intend to seek input from the RES staff, industry (NEI, EPRI), public interest groups, and universities with nuclear engineering departments, as well as issue a broad call for suggestions through a Federal Register Notice.

We would be interested in any recommendations you might have for topics for anticipatory research, beyond the normal user need process, that derives from the examination of industry trends and technology advances in an effort to try to foresee where the NRC may need information to respond to future regulatory issues in the longer term.

A copy of the Call for Anticipatory Research that we plan to issue is attached. We request your response by June 1, 2002.

Attachment: As stated

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## Call for Anticipatory Research Projects

NRC research is performed in order to meet a known or anticipated regulatory need. There are two subcategories of research that require separate consideration: confirmatory research and anticipatory research. Confirmatory research assists the agency in responding to license applications that are now before the agency or that are anticipated to come before the agency in the future-usually in the near future. This type of research supports the NRC's regulatory activities and is usually conducted at the request of the offices that are directly responsible for regulatory oversight - the Offices of Nuclear Reactor Regulation and Nuclear Materials Safety and Safeguards.

The NRC also conducts research programs that are more forward looking, research related to evolving technologies or issues that may become important regulatory concerns in the future. Some of this work may also be confirmatory in nature, providing independent assessment of information developed by the nuclear industry, but much of it is what we refer to as "anticipatory" research. These types of programs may not have been requested by our regulatory offices. Rather, this work arises from the examination of industry trends and an effort to try to foresee where the NRC may need information to respond to future regulatory issues. If we wait until these potential issues become actual regulatory concerns, it may be too late to develop the technical information to respond to them in a timely fashion. Examples of anticipatory research that have been highly valuable to the agency include probabilistic risk analysis methods and applications, severe accident source term research, and the evaluation of the effects of aging on plant components.

The Office of Nuclear Regulatory Research is seeking recommendations or proposals for anticipatory research both within NRC and from external stakeholders that will help NRC prepare for current challenges and regulatory issues anticipated in the future. The submittal should describe the proposed research and focus on the potential use of the research results in current or future regulatory activities.

The NRC is facing many profound challenges. They were discussed in a presentation by Chairman Meserve at the 2001 Working conference of the American Nuclear Society in August (available on the web at <http://www.nrc.gov/reading-rm/doc-collections/commission/speeches/s01-020.html>) and are summarized below:

- Establish the infrastructure for future licensing and new construction, possibly involving new designs.
  - The technical basis needed to support the NRC's regulatory activities in dealing with new reactor technologies and new policy issues must be developed. (This could include fuel performance, behavior of materials at high temperature, and graphite technology, for example)
  - Evaluation of new technological approaches to instrumentation and control and to the human-machine interface
- Reform the regulatory structure, moving to a risk-informed and performance-based paradigm.

- Continue to reform the reactor oversight process
- Develop the bases for additional regulatory improvement
- Develop a risk-informed regulatory approach, with associated acceptance criteria, for new reactor concepts being considered by the industry
  
- Re-licensing of existing plants
  - Consideration of aging issues to determine if further research is needed
  - Considerations arising from the Sept. 11 tragedy
  
- Disposition of spent nuclear fuel
  - Spent fuel pool
  - Independent storage on-site
  - Long-term storage
  
- Maintaining NRC's core competence
  - Staff training and education

At the Nuclear Safety Research Conference, Chairman Meserve spoke on enhancing the NRC's capacity to meet new regulatory challenges and focused on the need to maintain the research infrastructure - the need for technical personnel, experimental facilities, and analytical tools to help provide the technical foundation for regulation. The speech is available on the web at <http://www.nrc.gov/reading-rm/doc-collections/commission/speeches/s01-026.html>.

We also solicit your comments on the factors that should be considered when anticipatory research topics are prioritized, both among themselves, and in competition with confirmatory research responding to a stated need of one or the other program offices.

This request is also contained in a call for Anticipatory Research Projects, on the web at <http://www.nrc.gov/who-we-are/organization/resfuncdesc.html>

To permit these new topics to be considered in developing future plans, your recommendations should be submitted to Dr. James W. Johnson, Special Assistant to the Director, Office of Nuclear Regulatory Research, MS T-10-F-12, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, no later than June 1, 2002. Comments also may be submitted by e-mail to [jwj@nrc.gov](mailto:jwj@nrc.gov).