Under Secretary for Science
Washington, DC 20585

February 7, 2007

Professor Stewart C. Prager, Chair
Fusion Energy Sciences Advisory Committee
Department of Physics
University of Wisconsin
1150 University Avenue
Madison, Wisconsin 53706

Dear Professor Prager:

On November 21, 2006, the U.S. signed the ITER Agreement. This event signals a new era in fusion, where access to fusion burning plasmas will be available for the first time. This will involve an unprecedented level of international cooperation. The United States must have a robust, world-class domestic program to support our involvement with the international fusion community, and fully exploit the expected scientific and technical breakthroughs from ITER. It is recognized that ITER, by itself, will not provide answers to all of the scientific and technical issues that are required for the promise of fusion to be realized.

The fusion community met in Snowmass in the summer of 2002 where a consensus was reached that it was time to pursue a sustained burning plasma experiment, namely ITER. A subsequent FESAC report and the National Research Council of the National Academies of Science affirmed that community consensus. These studies will continue to inform decisions made within the Office of Fusion Energy Sciences. A feature of the community studies is that the U.S. involvement in ITER should constitute the penultimate step to consideration of a fusion Demonstration Power Plant (DEMO) in the United States.

To assist planning for the ITER era, it is critical that FESAC identify the issues arising in a path to DEMO, with ITER as a central part of that effort. Therefore, I ask that FESAC 1) identify and prioritize the broad scientific and technical questions to be answered prior to a DEMO; 2) assess available means (inventory), including all existing and planned facilities around the world, as well as theory and modeling, to address these questions; and 3) identify research gaps and how they may be addressed through new facility concepts, theory and modeling.

This is the first of two charges to FESAC—a second charge will be issued asking FESAC to develop a long-term strategic plan. This charge will ask that the plan include a specific pathway to DEMO within the context of the broader Office of Science Strategic Plan, as well as other program elements needed in a comprehensive strategic plan for fusion research. The effort of developing this strategic plan should build on the results of this first charge. This approach should allow FESAC to keep its response to this current charge at the conceptual level while reserving more detailed considerations to the results of the second charge. I ask that FESAC be mindful of this concept while preparing its response to this charge.

Please respond to this charge by October 1, 2007.

Sincerely,

Raymond L. Orbach

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Under Secretary for Science