April 5, 2005

Professor Richard D. Hazeltine, Chair
Fusion Energy Sciences Advisory Committee
The University of Texas at Austin
Institute for Fusion Studies
1 University Station, C 1500
Austin, TX 78712-0262

Dear Professor Hazeltine:

As you know, the Administration developed the Program Assessment Rating Tool (PART), comprised of assessment criteria on program performance and management. The Department, in conjunction with FESAC, produced the three long-term (FY 2015) PART performance measures for the Fusion Energy Sciences program in 2003, listed in Enclosure 1. The roadmap of objectives and performance targets toward the long-term PART measures is shown in Enclosure 2.

An independent, expert panel must conduct a review and rate the program's progress toward achieving the long-term PART measures on a triennial basis. I would like FESAC to conduct this review. As outlined in Enclosure 1, please rate the progress on each of the three long-term PART measures as excellent, minimally effective, or insufficient, including the rationale for your ratings. Please use the short and intermediate-term milestones from FY 2005 to FY 2009 shown in Enclosure 2 for Burning Plasma; Fundamental Understanding; Configuration Optimization; Materials Components, and Technologies; and Future Facilities as a guide in assessing the program's progress toward achieving the three long-term PART measures.

If FESAC believes that the program is not making adequate progress toward any of the three long-term (FY 2015) measures, please recommend how the program's performance could be improved.

Please send me your report by the end of January 2006.

Sincerely,

/s/

Raymond L. Orbach
Director
Office of Science

Enclosures:
(1) PART Performance Measures
(2) Roadmap of Objectives and Performance Targets

Program Assessment Rating Tool Performance Measures

Fusion Energy Sciences

Long Term Measures

- **Predictive Capability for Burning Plasmas –** By 2015, demonstrate progress in developing a predictive capability for key aspects of burning plasmas using advances in theory and simulation benchmarked against a comprehensive experimental database of stability, transport, wave-particle interaction, and edge effects.
    - Definition of "Success" – Major aspects relevant to burning plasma behavior observed in experiments prior to full operation of ITER are predicted with high accuracy and are understood.
    - Definition of "Minimally Effective" – Validate predictive models against the database for selected aspects relevant to burning plasma physics (e.g., energetic particles, instabilities, control of impurities, etc.).
    - How will progress be measured? – Expert Review every three years will rate progress as "Excellent", "Minimally Effective" or "Insufficient".

- **Configuration Optimization –** By 2015, demonstrate enhanced fundamental understanding of magnetic confinement and in improving the basis for future burning plasma experiments through research on magnetic confinement configuration optimization.
    - Definition of "Success" - Resolve key scientific issues and determine the confinement characteristics of a range of attractive confinement configurations.
    - Definition of "Minimally effective" - Provide understanding of the basic magnetic confinement issues for a number of the magnetic confinement configurations currently under investigation.
    - How will progress be measured? - Expert Review every three years will rate progress as "Excellent", "Minimally Effective" or "Insufficient".

- **Inertial Fusion Energy and High Energy Density Physics** – By 2015, demonstrate progress in developing the fundamental understanding and predictability of high energy density plasma physics, including potential energy producing applications.
    - Definition of "Success" - With the help of experimentally validated theoretical and computer models, determine the physics limits that constrain the use of inertial fusion energy drivers in future key integrated experiments needed to resolve the scientific issues for inertial fusion energy and high energy density physics.
    - Definition of "Minimally effective" - Develop and apply physical theories and mathematical techniques to model the physical processes in high-energy density plasmas and intense beams for inertial fusion energy.
    - How will progress be measured? - Expert Review every three years will rate progress as "Excellent", "Minimally Effective" or "Insufficient".