

18 December 2002

Dr. Charles Baker  
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Dear Charlie:

This letter contains the report on the VLT PAC meeting held December 4 and 5, 2002 in Washington, D.C. Your charge to the Committee had three principal parts. We list each part followed by our response to that particular part.

*Consider potential impacts on the VLT of enhanced U.S. efforts in burning plasmas (e.g., ITER and FIRE).*

- *priority of technology support of burning plasma needs compared to support of ongoing experiments and longer-term technology and materials?*
- *to what extent should ongoing VLT efforts be redirected in the near-term to support burning plasma needs?*

We believe that the current technology goals of the base program must be retained. It is, however, clear that the involvement of the technology community is essential for a successful burning plasma experiment. The challenge is to develop synergy between the additional new scope for burning plasma experiments and the important ongoing technology efforts. Your role as deputy to Ned Sauthoff will help ensure the involvement of the VLT community in ITER. We believe that it is premature to redirect near-term activities while the scope of the U.S. involvement in a burning plasma experiment has not been decided.

We commend the excellent work by Ned Sauthoff and you in preparing for ITER negotiations. This is clearly a complex task with urgent near term deliverables, if the U.S. enters into negotiations. We urge, however, that even in this early phase of

developing a burning-plasma program activity, every possible effort be made for continued communication and outreach to the entire research community. However the new initiative evolves, the VLT is not the appropriate home for a major burning plasma program. An urgent issue is the development of an organizational framework for a burning plasma experiment to ensure technology and research community involvement in support of design and construction and in preparation for operations. We endorse an idea that you voiced: A community-based burning plasma initiative in the form of a multi-institutional Field Work Proposal should be formulated as part of the preparations for the annual budget meeting this coming spring. This would be a first step in the ongoing effort needed to keep the research and technology community involved throughout the construction phase of the burning plasma project. Such involvement is always a challenge in large projects, but extremely important, of course, for the success of the endeavor.

The Committee concurs with the strong argument that was presented for the use of industrial consortiums in evaluating the ITER costs, assuming that the consortium(s) can be organized within the timeline needed. The need for augmentation of specialized expertise, which may not be available within the consortium(s), should be addressed.

The cost estimates need to be done not only for the high priority U.S. activities but also for other activities subject to negotiations, such as those identified by R. Aymar.

We are pleased with the progress on the design of FIRE and the reception it received at Snowmass. We commend Dale Meade and the FIRE team on the very high quality of their work. We encourage the continuation of this effort leading to a successful Physics Validation Review.

*Provide reaction and advice on further consideration of near-term VLT test facility needs.*

Ongoing modernization and construction of new VLT test facilities is important for the health of the technology program. The lack of modern facilities in the US is striking when compared to facilities in Europe and Japan. In many cases our facilities do not provide adequate support for our experimental programs.

A plan for facilities is needed in support of: the near term needs of the major experiments and the innovative confinement concepts; the development of the burning plasma experiment; and the long-term technology development for fusion. Input should be solicited from the major experimental programs and the ICC community on their needs.

The ongoing activities within the burning plasma experiment should identify the areas in need of R&D facilities. The 35-year MFE and IFE development plan provides a framework for a balanced, long-term technology program for the development of fusion energy. Well-defined plans can be developed now to meet the near-term needs of the program as well as the needs of future major facilities, based upon anticipated funding for a burning plasma experiment or a major commitment to the development of fusion energy. The plans should consider strategic leveraging from ongoing activities within the DOE such as the Office of Science's nanofabrication research and the NNSA's Stockpile Stewardship Program.

*Comment on proposed increased attention to VLT milestones.*

We believe that your proposed approach is adequate.

As usual, the presentations to the Committee were excellent. We appreciate your preparation and leadership. If you have any questions regarding our report, please feel free to contact us.

Roger Bangerter, Chairman

Donald Batchelor

Jill Dahlburg

Richard Hawryluk

Bick Hooper

Tom Jarboe

Joe Kwan

Miklos Porkolab (Richard Temkin represented Miklos on December 5.)

John Sethian

Richard Siemon

