

December 23, 2014

Dr. Patricia M. Dehmer
Acting Director
Office of Science
U. S. Department of Energy
1000 Independence Avenue, S. W.
Washington, DC 20585

Dear Dr. Dehmer:

As FESAC members who oppose approval of the FESAC Strategic Planning Panel Report, we are writing to explain our concerns.

We appreciate the hard work of our colleagues who worked on the report, and their willingness to make difficult decisions. However, we think acting on the recommendations of the report would be damaging to fusion and plasma science both in the short term and in the long run. To summarize the overarching points, we think the report recommends a narrowing of research goals in fusion plasma physics that is unwarranted by the current state of knowledge, that it gives short shrift to the broader category of Discovery Plasma Science (DPS) that is critical to plasma physics in general and fusion plasma physics in particular, and that it recommends the abrupt transfer of resources to preparing for a Fusion Nuclear Science Facility (FNSF) without appropriate scientific justification for the goal itself or the short term disruptions that would ensue. These problems are exacerbated, in our view, by the implied selection of certain facilities without peer review and on over-reliance on interagency partnerships and international collaborations for which there exist little foundation. To amplify:

The underlying strategic vision is fundamentally flawed. A primary metric used to dictate the future of the fusion program is unnecessarily focused on a single facility, FNSF. The precise mission and scope of FNSF has yet to be defined. As such, it is difficult to advocate for this step without widespread community support and proper articulation of its role in fusion energy development. We feel strongly that a vision statement for OFES should be focused on addressing scientific challenges facing our field and not on specific facilities.

While it is clear an increased emphasis on nuclear technology will emerge as we near the dawn of the fusion energy era, there is no technical demonstration of sufficient maturity in the fusion science to warrant the wholesale reorientation of the program. The report advocates a narrowing of the plasma and fusion science research program to a few key initiatives that would lead to lost opportunities for continued or strengthened US leadership in other important areas of science and technology. Moreover, the proposed enhancements in nuclear technology at the

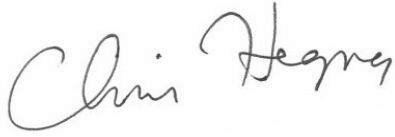
expense of fusion science suggests a plan focused on fusion energy development, a vision that is conflict with OFES's home in the Office of Science.

A much stronger case should be made for fundamental plasma science and engineering. The Discovery Plasma Science (DPS) program element supports impactful, innovative research into a broad range of plasma science and engineering questions. This work builds the fundamental science foundation that enables progress in mainline fusion energy research and provides opportunities for the development of transformational new ideas. In addition, research supported by DPS leverages laboratory plasma and fusion science research to make important progress in other related areas, such as astrophysics and space physics, raising the visibility of fusion science research in other communities. Several FESAC and national academy reviews have strongly encouraged OFES to lead the stewardship of plasma physics. This report is a step backwards in this regard. DPS should be protected and targeted for growth within DOE OFES. Reliance on other federal agencies for growth opportunities puts the stewardship of plasma science at risk. In addition, the panel report places far too much emphasis on the role of DPS in workforce development. The engagement of university faculty, researchers, and students is absolutely essential across all areas of OFES, not just in DPS. Training the next generation of scientists is important in a long-term effort such as fusion energy development. However, implying that workforce development is a primary justification for support of fundamental plasma science and engineering within the federal complex marginalizes this important and vibrant area of research. Plasma physics is a fundamental physical science and should be treated as such.

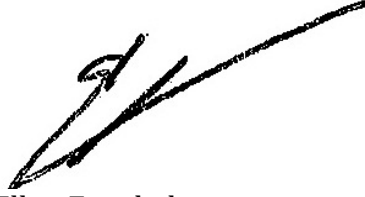
While the panel did make tough choices in response to the charge, the program choices made are not supported by strong scientific cases. The programmatic decisions are largely driven by a need to fit within the specific budget, not driven by the need for innovative fusion science elements. While the existence of various program elements are justified by their connectivity to ITER and FNSF, the specific logic for each specific choice is missing. Moreover, there is a lack of symmetry in the report with regard to using competitive, peer-reviewed processes to initiate new program elements. Regardless of the programmatic choices, the highest scientific integrity must be maintained in the fusion program.

Finally, we commend the fusion community for offering an exciting array of challenging and provocative scientific topics in the form of white papers and presentations to the FESAC sub-panel. Little of the scientific vitality of this collection of presentations is captured in the report. Hopefully, OFES will be able to harness the excitement of the integrated vision of the entire fusion community to motivate a 10-year plan that frames a challenging and vibrant fusion science program.

Sincerely yours,



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