

NSTX Upgrade Program Advisory Committee Meeting – PAC-33
February 19-21, 2013
Lyman Spitzer Building - B318

Background:

The NSTX-U research team is presently engaged in writing a 5 year plan for 2014-18 utilizing the new capabilities associated with the NSTX Upgrade project (new centerstack and 2nd neutral beam injector) plus additional proposed facility and diagnostic enhancements. The written plan is due to the Office of Fusion Energy Sciences (FES) in early April 2013, and the full plan will be presented to an FES-appointed external review panel in May/June of 2013. The NSTX-U research team would very much value a critical assessment of the draft 5 year plan by the PAC to assist the team in preparing for the plan review.

Charges:

1. Assess the NSTX-U 5 year plan with respect to how well it addresses the key physics issues needed to evaluate the potential of the ST to provide high-performance plasmas for use in a future fusion research facility. Example future fusion research facilities include a toroidal plasma-material-interface facility, a fusion nuclear science facility, or a Pilot Plant/DEMO.
2. Assess the plans to investigate key tokamak physics issues for ITER.
3. Assess plans to contribute to model validation and the development of predictive capability.

In addressing charges 1-3 above, please comment in particular on the strength of planned NSTX-U contributions to boundary physics and plasma-material-interaction research.

4. Comment on possible improvements to the NSTX-U 5 year plan presentations including logic and format.

The PAC could consider using the following criteria for evaluating the 5 year plan:

- A. Assess the **scientific** and **technical merit** of the ongoing and planned research.
 - a. How well does it maintain a U.S. leadership position in key areas of fusion research? (consider both merit and originality)
 - b. Does the research effectively address important issues in plasma and fusion energy science and technology at the forefront of the field?
 - c. Is the research plan adequately developed and likely to lead to new or fundamental advances in fusion science and technology?
 - d. Does the proposed research employ innovative concepts or methods, and are potential problems identified along with appropriate mitigation strategies?
- B. Assess the **importance** and **relevance** of the proposed 5-year research program.
 - a. What is the likelihood of accomplishing the objectives stated in the proposal?
 - b. What is the quality of integration of NSTX-U research with other national and international fusion research activities?