

Dear Colleagues:

*Review of National Spherical Torus Experiment (NSTX) Facility Operations –
Operational effectiveness and efficiency of major research facilities*

Thank you for agreeing to serve as a reviewer for the Office of Fusion Energy Sciences (OFES) at the upcoming NSTX facility operations review. The purpose of this communication is to provide you with some limited background information and the list of questions that we would like you to address during the review.

The NSTX National Fusion Facility is a magnetic fusion experiment operated by Princeton Plasma Physics Laboratory (PPPL). OFES also provides direct funding to four other DOE laboratories, twelve universities, and four private companies to collaborate in the NSTX national research program. PPPL and the NSTX team will provide you access to the information listed in enclosure 1 approximately two weeks prior to the review. They will also provide you with a copy of the proposed NSTX five year program plan that will be submitted to DOE as part of their proposal for a renewal of the cooperative agreement.

In order to assess the operational effectiveness and efficiency of the NSTX National Fusion Facility we would like you provide your individual evaluation, answering the following questions to the best of your ability:

1. **Facility effectiveness:** Is the facility being operated in an effective manner to achieve the scientific and technical objectives of the program and optimize the scientific output? Are the hardware, plasma control capabilities, and measurement capabilities available to address program goals and the high leverage scientific issues?
2. **Cost/efficiency:** Evaluate the performance and cost efficiency of facility operations and facility availability data– are personnel appropriately allocated with the correct level and mix of skill sets, and are the materials, travel, equipment, subcontracts, and other proposed costs appropriate and optimized to meet the facility mission, goals and objectives? In your opinion, what is the appropriate cost per incremental week of operation of the facility? Is there effective sharing of operational experience and equipment (where practical) with other fusion facilities? What changes or improvements in any of the areas above would increase operations cost effectiveness and efficiency? Comment on any facility costs that show potential for savings or have trends that will be of concern in the next 2-3 years.
3. **Availability:** What is the overall availability of research time to the community in relation to the optimum amount? What is the backlog in proposed research at the facility (in years) and in data analysis?
4. **Support infrastructure:** Does the facility have the necessary level of planning, procedures, preventative maintenance, environmental, health and safety, security, and

cyber security support to provide efficient and safe operations? Is there an ongoing program of self-assessment and continuous process improvement aimed at improving the efficiency and performance of facility maintenance and operations? Does the facility have a sufficient spare parts inventory for reasonable mitigation of down time risks? What are the programmatic, technical and infrastructure risks in this time frame?

5. **Upgrade and modernization plans:** Evaluate any proposed facility upgrades or planned operational improvements – are these reasonable and will the facility effectively support research users for the next 3-4 years? What changes or improvements in any of the areas above would increase operations cost effectiveness and efficiency?
6. **Connection to program/users:** Is facility management effectively setting priorities, tracking progress, resolving problems and communicating with key stakeholders? Comment on how the program and facility provide for the professional development and career opportunities for the staff/users. (to be determined in breakout interview sessions) – is there effective input from the user community on operational and programmatic issues? Is the mix of host/non-host support optimum?

Federal and DOE policy stipulate that we use independent reviewers who report individually in writing to us. Please send your report to me (steve.eckstrand@science.doe.gov) and Friday, August 29. Please prepare your comments in an anonymous style and identify yourself on a separate enclosure. We may quote portions of your review to the facility management and want to preserve your anonymity.

The review will begin on the morning of Wednesday, July 30 and will end at approximately 3:30 PM on Thursday, July 31, 2008. Specific site directions and a detailed agenda will be provided later by the PPPL NSTX Program Director.

Thank you very much for your assistance with the review. Rigorous periodic peer review will help ensure that our major OFES facilities are being operated in the most efficient and effective manner to support fusion science research in the U.S. Your contribution to this process in support of the national scientific enterprise is highly valued and greatly appreciated.

Should you have any questions, please do not hesitate to contact me at (301) 903-5546.

Sincerely,

Enclosure

Enclosure 1

Information/data to be provided to the facility operations review panel

1. Description of the facility and the organization of operations staff – describe function of each major organizational unit. (Including Environment, Safety, and Health (ES&H), security/cyber security, and other general support elements as appropriate.) Briefly describe any indirect support received from corporate/lab/university resources.
2. Description of hardware capabilities at the facility, including power supplies for the tokamak and heating and current drive systems, the heating and current drive tools, pumping systems, diagnostic systems, etc.
3. Brief description of ongoing activities (including current year experiment plan summary) and planned upgrades. Include a brief description of the process used to allocate research time on the machine and the number of research proposals received per year versus the number accomplished.
4. Facility user data (previous fiscal year) – broken out by status as host, non-host lab, non-host university, non-host industry, international, and including demographic data (degree/student status, institution, first time/repeat user, type of user [direct/associated]) where available.
5. Hours of operation (previous 2 years, current, and proposed future 2 at least) – scheduled for experiments, performed for experiments, plasma conditioning/testing, setup and testing (e.g. power testing, coil testing, etc.).
6. Number of refereed scientific publications, invited talks, other contributions to conferences produced by use of the facility.
7. Facility budget data (previous 2 years, current, and proposed future 2 at least) – budget data to be broken out by major subsystem/support element and include all cost categories (labor, materials, supplies, subcontracts, services, travel, capital equipment, indirect rates, fees, etc.).
8. Personnel tables (previous 2 years, current, and proposed future 2 at least) – direct Full Time Equivalent (FTE) tables broken out by major subsystem and categories (scientist, engineer, technician, administration, etc.).
9. Description of typical costs involved in one incremental week of operations, with supporting historical materials as appropriate.
10. Number of diagnostic systems – host, non-host; data collection aspects/limitations.
11. Discussion of any expected trends or planned major changes that would impact facility operations in the near future (2-3 years)
12. Executive summary level results of any system self-assessments recently performed.