NSTX-U PAC-37 Charge Questions

January 26-28, 2016

Background:

The NSTX Upgrade Project successfully achieved first test plasma on August 10, 2015 and the Upgrade Project was declared complete by the DOE Office of Science in September 2015. Since first plasma, full vessel bake-out has been completed, nearly all diagnostics needed for the FY2016 run campaign have been installed and made operational, and all required coil and power supply systems have been commissioned. A team-wide research forum was held in February 2015 to generate a prioritized set of experimental proposals to achieve the FY2016 NSTX-U research milestones. The highest priority experimental proposals (~30 proposals representing 50-75% of the available run-time) have been reviewed and are ready to be executed as machine conditions allow. NSTX-U recently resumed physics operations and will operate 18 run weeks in FY2016. The 2014 DOE Fusion Energy Sciences Advisory Committee (FESAC) Strategic Planning Report was issued in the fall of 2014 and recommended four initiatives including (Tier 1) "Control of deleterious transient events" and "Taming the plasma material interface" and (Tier 2) "Experimentally validated integrated predictive capabilities" and "A fusion nuclear science subprogram and facility". Building from these proposed initiatives, several community-led workshops were held during 2015 to identify scientific challenges and research opportunities in the areas of (1) Transients, (2) Plasma-Material Interactions, (3) Integrated Simulations, and (4) Frontiers of Plasma Science. The recently released FES report to Congress "The Office of Science's Fusion Energy Sciences Program: A Ten-Year Perspective" also emphasizes these 4 strategic areas of opportunity. Given this background, the NSTX-U Program would benefit from PAC input on the following charges:

Charges:

1. Please assess the research planned to be carried out for the NSTX-U FY2016 experimental campaign - are there any major missing elements, or new opportunities?

2. Please assess the alignment between the NSTX-U research plans and goals and the FESAC / FES initiatives, research opportunities, and ITER urgent research needs.

3. Please comment on the progress and plans for the NSTX-U / PPPL theory partnership, and how well this partnership and the broader NSTX-U research activities support "integrated predictive capability".

4. Please comment on the present team prioritization of planned facility enhancements including: divertor cryo-pump, non-axisymmetric control coils (NCC), 28GHz ECH/EBW gyrotron, and conversion to all high-Z PFCs and liquid metals research.