NSTX Facility Capabilities and Availability for FY'04 Experiments

Basic

Toroidal field: **0.35 T (start of plasma ops.) → 0.45 T (week 4) → 0.55 (0.6) T (week 14)**

Plasma current: 1.5 MA for most experiments; limited by product $I_p \times B_T < 0.67$ MA.T

Solenoid flux swing: 0.7 Wb

Bakeout: 320 – 350 °C on PFCs and inner wall components, 150 °C on outer vessel

Boronization by room-temperature in TMB/He mixture (standard), plus **Hot-wall boronization (approved, not tested) and Between-shots boronization (not tested)**

Fueling & edge modification

Top outer and midplane outer gas injectors

Inner wall midplane and **upper-shoulder gas injectors with separate control**

Lower-dome gas injectors (for CHI) with **reduced plenum volume**

Supersonic gas injector (SGI) (presently on CDX-U; to be installed on NSTX during run)

Solid pellet injector (LPI): up to 8 pellet/shot of Li, B, C or other material (to be installed by start of plasma operations)

Auxiliary heating & current drive

NB: 5 (7) MW (total) power in D at 80 (95) kV; leaking TIV repaired; duct bellows repaired (but not replaced); source B replaced

RF: 6 MW (total) launched power at 30 MHz; capability for **loading control by feedback control on outer boundary** location to be commissioned during run

Plasma Control

Reduced latency (~4ms → <1 ms) in real-time data flow from sensors to power supply commands to improve vertical position control and range of elongation controllable; improved **algorithms for vertical control** to be commissioned during run.

CHI and non-solenoid startup

Developing **CHI capacitor bank** for "transient CHI" experiments (available mid-run)

Providing connections for **separately powering PF4** coils (using PF1B supply) to achieve breakdown field null and flux from outer PF coils (available mid-run)

RWM control

Developing set of **6 external, mid-plane RWM control coils** to be installed during run;

Provision of **fast power supply for RWM coils** dependent on final NSTX budget