Research Operations Division
Boundary Physics *(H. Kugel)*

- LITER-1 now installed on NSTX at Bay F top port
  - Project has been through many vicissitudes since February
  - Original design failed during offline testing in L-245 laboratory
    - Snout heater had failed during assembly
    - Lithium accumulated in snout which could not be heated adequately
    - Not clear whether lithium leaked through plug or condensed in snout
  - Redesigned evaporator using plug-free reservoir and commercial heaters
    - Adequate evaporation rate and a clean nose achieved in offline tests
    - Went through a second round of reviews and approval
  - Now performing PTPs for controls, ISTP and initial evaporation
  - Initially limit evaporation rate to estimated ~1mg/min tested in laboratory
- Second cartridge being prepared for offline testing in L-245 chamber
  - Determine operation characteristics at higher evaporation rates

Research Operations Division
Boundary Physics *[2]*

- LPI used for TESPEL injection - collaboration with N. Tamura, NIFS; JHU
  - Slivers of lithium (~10^{18}) surrounded by deuterated polystyrene capsule
  - Studied Li deposition into NB-heated H-modes with USXR, Li telescope, fast cameras, filterscope arrays
- Boronizations 50 (10g) & 51 (3g) of DTMB
- XP-616 was completed to compare the effects of HeGDC with the fixed GDC probe and the insertable GDC probe. (R. Maingi, ORNL)
- New A10 infrared camera calibrated and operating (R. Maingi, ORNL)
- Fast Reciprocating Probe team completed mechanical and electrical upgrades, including those needed for CHI experiments (J. Boedo, UCSD)

Research Operations Division
Diagnostics *(R. Kaita, D. Johnson)*

- MPTS
  - Performed Rayleigh/Raman calibrations at start of run
  - First 20 channels are operating normally
  - Encountered problems with 10 new channels
    - Investigating calibration and possible hardware issues
- Performed full MSE calibration
  - 0.35 – 0.45 T with PF5 to 19 kA
- New diagnostics
  - Upgraded “optical” X-ray array (JHU)
  - Electron Bernstein wave radiometers with remote antenna control
- High-k scattering fluctuation diagnostic
  - Performed dedicated shots for alignment but issues not fully resolved

Research Operations Division
Diagnostics

- Moving ahead with design, procurements for PCHERS (FY'07)
  - FDR for vacuum flanges, collection optics and mounts on Mar 2.
  - Now procuring fibers followed by spectrometers

Research Operations Division
RF Operations *(J. Hosea)*

- First HHFW conditioning into plasma on Feb 28 (XMP-26):
  - 1.2 MW delivered to plasma
- HHFW heating of CHI plasma on March 6 - 7:
  - 100 kW delivered to low density plasma with 2 sources for 180° phasing
  - Edge electron temperature doubled to 7 eV
  - Project ~1 MW can be delivered to plasma with 6 sources and optimum matching
  - Need to study heating *vs.* phase
- Voltage limit circuitry installed in preparation for start-up experiments
  - Calibration is underway

Research Operations Division
Physics Operations *(D. Mueller)*

- Good, long-pulse discharges have been produced
  - Now possible to make repeated long pulses throughout the day
  - Presumed reason is longer bakeout of vacuum vessel before run
- Plasma Control
  - Tested, debugged and installed new version of plasma control software
  - Error field correction feedback used to control SPAs
  - Real-time mode identification and feedback used successfully
- Operation has been impacted by real-time data acquisition faults
  - Modified software and installed monitoring 'scope to help identify cause
- Gas injection system modified to permit using additional 3 piezo-electric valves in parallel
- Now installing MOVs and snubber capacitors for 2kV CHI capability