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

- Developing movable-anode GDC system for insertion through Bay K top
  - Expect delivery of 48” stroke probe drive in April
    - Uses the same mechanism & controls as SSGI Probe
  - Fabricating anode and mounting here
- Existing Bay-K anode relocated to Bay-L for bakeout and backup
  - Bay G anode moved to wall below
- Upgraded electronics for Fast Reciprocating Probe (UCSD)
- Installed cassette system for poloidal array of deposition coupons
  - Received analysis of coupons from previous run (SNL)
- Installing quartz deposition monitors at midplane & upper, lower divertors
- Design for advanced SGI nozzles underway
  - Also upgrading operational interlocks for SGI system

Research Operations Division
Boundary Physics *[2]*

- Preparing for calibration of 3 IR cameras during bakeout
  - View Upper Divertor to improve power accountability
    - 2 existing cameras view Lower Divertor and CS
- Developing plans for lithium coating research
  - Experiments with lithium pellet injection in 2005
  - Meeting with ALIST Group at PFC Meeting in Livermore, Dec. 6 – 8 on possible installation of a lithium surface module

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

- Additional 10 spatial channels for MPTS - *Milestone D(05-1) (9/05)*
  - Meeting Monday to discuss distribution of new channels (LeBlanc)
  - Complete installation of polychromators, electronics, fibers in Jan.
  - Should be operational but may be uncalibrated at start of run
- Installing High-k microwave scattering - *Milestone D(05-2) (9/05)*
  - Modified Bay K port for detectors, Bay H & NB armor for input beam
    - Very tight on space and schedule
    - Need to perform full spatial calibration after CS casing replaced
  - Complete design, fabricate & install external components Jan. – Mar.
- Poloidal CHERS / ERD
  - New passive plate jumpers and divertor plates fabricated
    - Modify secondary passive plates next outage
  - Reviewing budget to make a subset of full system available in FY06

Research Operations Division
Diagnostics *[2]*

- Repaired malfunctioning B_P, B_Z magnetic sensors and wiring
  - Better shielding and noise immunity of integrators against RFI
- Fabricated new I_p rogowski coils
  - Cross-calibrate against surviving coil for continuity
- Modified ports at Bays G, I, K
  - Enlarged port for electron Bernstein wave antenna
  - Improved view for visible bremsstrahlung
  - Additional clearance for SSGI and associated magnetic sensors
  - Rear view of pellet trajectory
- New microchannel plate for SPRED will improve image uniformity
- Many calibrations performed:
  - USXR arrays (JHU), VXRCS (LLNL), GPI (Nova), CHERS, ERD, MPTS

Research Operations Division
RF Systems *(R. Wilson)*

- Moved outer antenna protective tiles in 5 mm to alter near sheaths
  - Also better protect from energetic beam ions
- Instrumenting some passive plate rogowskis to detect sheath currents
- Modifying ORNL edge reflectometer to detect density fluctuations at f_{HHFW}
  - Parametric decay as well as 30MHz wave penetration
- Modifying edge RF probe
  - More robust probe tip should allow closer approach to edge
  - Digitize signal directly to obtain time dependence of decay spectrum
- Upgrading computer interfaces

Research Operations Division
Physics Operations *(D. Mueller, D. Gates, R. Raman)*

- Upgrading control system to prepare for FY'05 experiments
  - Update PF1A, magnetic sensors and vessel model used for rtEFIT
    - Match off-line EFIT(01)
  - Real-time data acquisition for internal B_r, B_θ coils for detection of RWM
  - Add capability to control SPA for RWM coils in 3 stages:
    - Preprogrammed currents to 3 B_R coil pairs
    - Real-time $I_{SPA} = [G] \cdot I_{PF}$; elements of [G] are PID operators
    - Feedback on measured RWM component amplitudes
  - Implement $I_{TF} \times I_{PF}$ interlock to reduce stress on TF flags joints
    - Data is already available in PCS but algorithm TBD
  - Some concern about time for additional data acquisition and processing
- New ports in lower divertor chamber to inject ECH power and gas for CHI
  - Gas injector being installed; waveguide, launcher in January