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

- LITER-1d used in many experiments with a variety of discharge types
  - Reliably operated with evaporation rates up to ~60mg/min
  - Expended initial lithium charge of 77g on 6/1 then reloaded with ~50g and returned to operation on 6/14 for last week of run
  - Now in L-245 for lab. measurements of evaporation characteristics
- Inspection of vessel interior showed wide dispersal of lithium
  - Accumulation (flakes) on tiles near evaporator not directly exposed to lithium plume is probably a result of ionization in HeGDC
- Rising core radiation and metal content after 0.4–0.6 s occurred with increasing frequency late in the run
  - Cause and relationship, if any, to lithium evaporation not yet clear
  - Assessing role of operational factors (*e.g.* outer gap at low I_p)
  - Plan to shield possible sources on BEAP and RF antenna
  - Analyzing surface of tiles and developing plan to clean them if needed

Research Operations Division
Boundary Physics *[2]*

- LPI used for injecting stabilized lithium dust into discharges (XP-738)
  - Produced significant density reduction in subsequent shots
  - Investigating possibility of a lithium powder “dropper”
- Developed specifications for position of liquid lithium divertor module
  - Annulus of width 15cm with inner radius 5cm outside CHI gap
  - SNL is now developing design for CDR in October at PPPL
  - Fabricating trays at PPPL for tests at SNL of lithium wetting of mesh
  - Other groups (UIUC, UCLA) are becoming involved
- Discussing installing second LITER to increase coverage for 2008
  - Possibly use MGP transport at Bay K upper
  - Need to assess impacts on diagnostics and all in-vessel systems
  - Provide interlocked shutter to prevent coating diagnostic windows

Research Operations Division
Diagnostics *(R. Kaita, B. Stratton)*

- Completed run with high-k scattering data from several experiments
  - Performed *in situ* calibrations after run to complete analysis
- A progressive coating of MPTS collection window ocurred during June
  - Affects MPTS density profiles but not apparently temperature
  - Effects depend on shutter configuration and are not uniform
  - Correction scheme developed using available FIReTIP data
  - Plan to write re-calibrated density profiles to MDS within a few days
- Completed post-run calibration of Poloidal-CHERS
  - Should be able to analyze data taken early in run
  - Camera with thermal leak lasted long enough – now replaced
  - Identified problem with stuck shutter and working on a fix

Research Operations Division
Diagnostics *[2]*

Major diagnostic work planned for the opening

- **PCHERS**
  - Long-lead items expected in time for installation and calibration
  - Modifications to diagnostic room, cable tray installation, and wall penetration to start soon
- **Divertor bolometer upgrade**
  - Design underway for installation at Bay I bottom
  - Delivery of detectors and vacuum components expected mid-October
- **MPTS calibration probe**
  - Modify existing alignment probe to provide in-vessel light source to monitor MPTS window transmission
  - Concept successfully tested during post-run calibration

Research Operations Division
Diagnostics *[2]*

- **Halo current sensors on outboard divertor**
  - Two rings of discrete B_T sensors to synthesize rogowski coils
  - Peer review held and fabrication in progress

Testing of surplus diagnostic equipment for ASIPP has started

- **20 channel ECE grating polychromator** (TFTR)
  - Electronics tested and cryostat reevacuated
  - Cool detectors and complete testing shortly
- **NPA** – electronics will be tested next week
- **PHA** – Ge detectors for will be mounted in housings next week

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

- Analyzing extensive data set for HHFW heating from the run
  - Peak power to 3.4MW, total injected energy per pulse to >1MJ
  - Coupled >1MW in several phasings
  - Running fast EFITs for modulation analysis and MSE analysis for matched $T_e(r)$ discharge pairs with different phasing
- Established dependence of profiles and heating efficiency on phasing
  - At -30° phasing, efficiency about half that for -90°
  - Critical factor appears to be edge density relative to threshold for perpendicular wave propagation
  - n_e profile broader at longer wavelength; $T_e(0)$ only ~10% different
- CHERS v_ϕ profile shows feature at possible ITB for shorter wavelength

Research Operations Division
RF Operations

- Modelling underway to understand results and optimize HHFW
- GENRAY (ray tracing) indicates that waves propagate more tangentially than radially in the edge, in constrast to conventional ICRF
  - >80% of power is damped on first complete transit
  - Waves do not propagate much past the axis
- Full-wave codes AORSA and TORIC also show toroidal propagation
- Both ray tracing and full wave codes indicate that surface waves may cause edge damping at higher edge densities
- Modifying AORSA and TORIC to calculate 3D power deposition and Poynting flux
  - Show where edge power deposition may be a problem
- Simulations of HHFW driven current underway with all three codes

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

- Completed PTP for control system upgrade
  - All hardware appeared to function
- Last shot of run ran with new system (just)
- Bugs and issues revealed in tests have been corrected
- Plan to return to operation with new system
  - SkyBolt system now turned off but will be retained as backup
- Investigating possibility of adding NBI power control for β_N feedback for next run