FY06 plans for CDX-U and LTX

CDX-U

LTX

- LTX is now scheduled for first plasma in ~ 1 year
  - Schedule has been advanced due to cost, time savings in fabricating the shell
  - LTX will be brought up in phases
- First phase:
  - Heated shell installed
  - Partial evaporator set (<100% lithium coverage of the shell)
  - New OH system
  - No upgrades for TF, PF
  - CDX-U diagnostic set, no Thomson scattering
- Second phase:
  - Double TF to 4 kG
  - New PF coil set
  - Pellets, high field side gas jet
  - Long-pulse OH supply
  - Thomson scattering, other diagnostic upgrades
  - New shell?

PPPL

CDX-U

- CDX-U **MUST** shut down by the end of June in order to hold the LTX assembly schedule.
- Final experiments:
  - Liquefy the south tray lithium inventory by e-beam heating between shots
    - » Avoid local evaporation of lithium - heat entire inventory
    - » Diagnose effect of coatings from “global” evaporation of the tray inventory
      - Monitor coating thickness with deposition monitor
    - » Quantify recycling coefficient with CDX-U gas jet
  - Employ ESC code (Zakharov) to diagnose equilibrium
- Very limited capability for further free-surface lithium e-beam testing
    - » Some extensions in power density, magnetic field possible

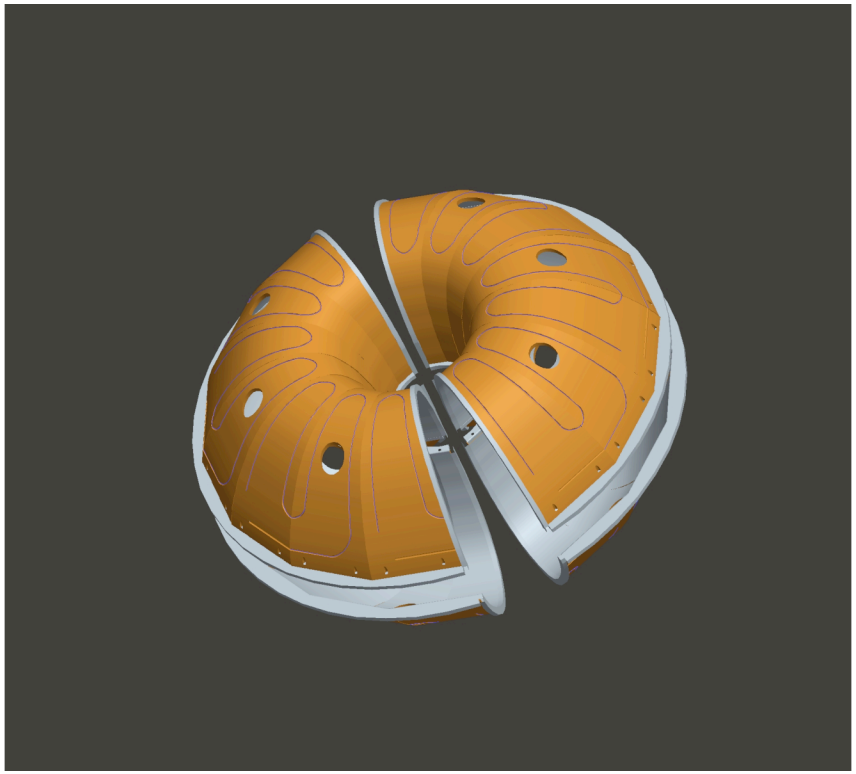
LTX

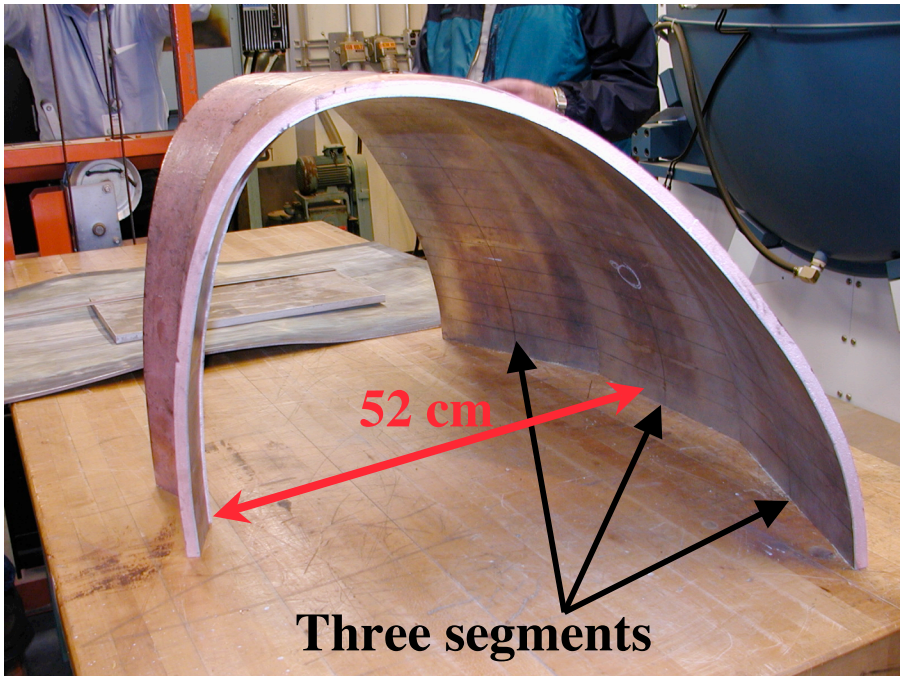
- Budget & schedule “adjustments” permitted extension of CDX-U run into CY05.
  - No need to commence disassembly of CDX until ~3 months before LTX shell is complete
- Change from stamping to bending shell segments reduced shell costs, speeded up schedule
  - Local facility has demonstrated bending segments with required (1/16”) tolerance
- Shell is scheduled for completion this FY
- Installation of shell in CDX vessel will begin in FY06
- Expect ~6 months to first plasma from start of installation
- BUT:
  - DOE has decided to recompete all the ICCs with budgets > $1M
  - LTX proposal is being resubmitted

LTX shell in fabrication

CDX-U

- Explosively bonded SS on copper (1.5 mm layer 304 SS on 1 cm OFHC copper).





•Shell is designed with toroidal, poloidal gaps.

-electrical breaks + diagnostic access.

•Circular penetrations for coating systems (e-beam or evaporative).

•Test shell sections have been fabricated.

•Trimming, welding of three segments in progress

•Remaining shell material on order.

LTX program in FY06

CDX-U

LTX

- Primary goal is to re-establish CDX-U low recycling results with a coated, heated shell
- First phase LTX will have enhanced capabilities compared to CDX-U
  - Programmable OH system will allow full investigation of loop voltage characteristics (current profile effects)
  - Low field side gas jet capability will be expanded
  - Continued development of ESC modeling capability
- Envision 6 month operational phase in this configuration
  - Through end of FY06
- Hope to switch to porous molybdenum-coated shell for next phase
  - Second phase to begin in late FY07

PPPL