

DIID-D DiMES and MiMES Planning 2006

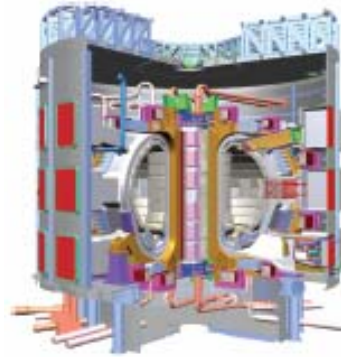
"Continue Analyses And Experiments In Support of ITER"

Presented by
C. Wong

In collaboration with
D. Rudakov, L. Chousal (UCSD)
P. West, T. Evans,
R. Deranian, D. Taussig (GA)

Presented at
PFC Workshop
Princeton Plasma
Physics Laboratory
New Jersey

May 9-11, 2005



1. Support and analyze:

- Gap experiments
- Mirror experiments
- Porous plug exposure...Support
- Hydrogen sensor
- Tile current monitor
- Carbon dust

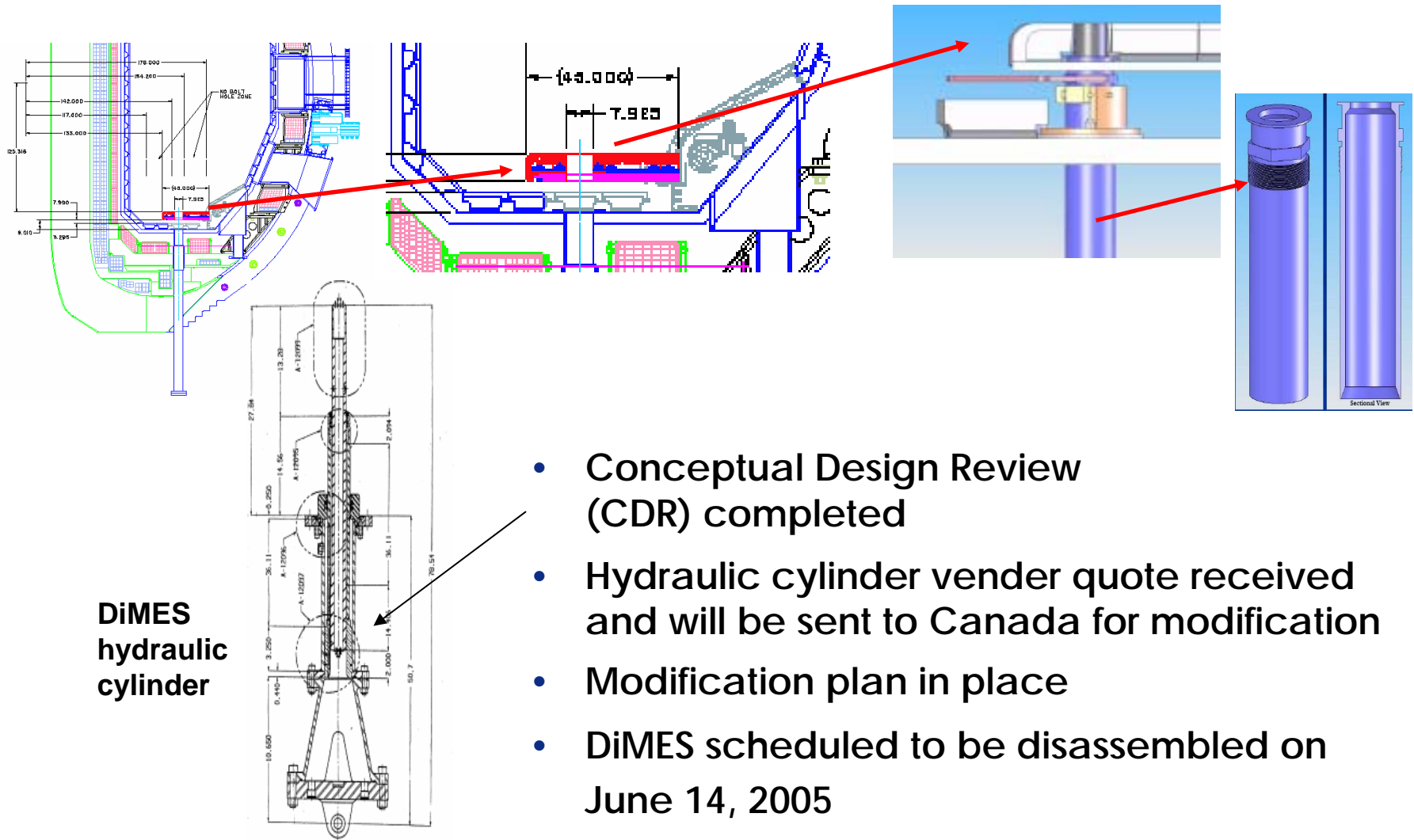
2. DiMES vertical extension...EDR and implementation

3. MiMES...CDR, EDR and implementation

4. Plan and perform FY06 experiments

5. Continue atomic data and modeling support

DiMES Modification "Raise Sample by 11.27cm Surface Align to 0.1 mm"



Lower Divertor DiMES LTOA Modification

Task Outline Summary

Task 1. Guide-tube/chimney extension (D. Taussig)

- New vertical height and fine alignment with surrounding tiles
- Vertical alignment is very important for smooth DiMES sample insertion
- Installation has to be well coordinated with the installation of the new divertor floor opening and tiles

Task 2. Hydraulic cylinder extension (C. Wong)

- Disassembly and examination
- Manufacturer in Canada has been contacted, quotations and schedule received for rework and a new cylinder option is a backup
- Hydraulic cylinder to be sent after June 14th

Other tasks: (C. Wong)

Task 3. Miscellaneous: PLC service or upgrade (always insertion mode), limit switches

Task 4. Systems reconditioning: hydraulics, PIV/vacuum, diagnostics, electrical, sample exchange window screws and nuts

Task 5. Re-assembly, testing and alignment

Midplane Material Evaluation Sample (MiMES)

Coordinator: D. Rudakov

Physics Validation Review Completed
April 27, 2005



D. Rudakov, C. Wong, J. Boedo, N. Brooks, R. Moyer, J. Watkins, P. West



DiMES old window



Fast Probe and MiMES Physics Value Added Summary (Specific to MiMES)

- Airlock
 - Fast repair of the plunging probe head
 - Using changeable probe heads for specialized physics measurements: flows, Reynolds stress, magnetic fluctuations, ion temperature, etc.
 - **Enable MiMES**
 - No functionality of the present setup will be lost
- MiMES (Midplane Material Evaluation Sample)
 - **Net erosion/deposition measurements (integrated over exposure time)**
 - **Tritium retention in the first wall elements (including tile gaps)**
 - **Complement to the existing DiMES system**
- Optical view of probes/**MiMES**
 - Single chord filterscope view: **real-time, in-situ erosion rates**
 - 2D camera view: **mass transport of the eroded material**
 - **Edge recycling and chemical sputtering of carbon**

MiMES Status

- Passed PVR
- Will prepare for CDR and EDR
- Aim for implementation before 3/2006
- Leo Chousal (UCSD) will be the design engineer support by DIII-D personnel
- Planning has just been initiated

FY2006 Budget Estimate

- **DiMES + MiMES (Rudakov, Wong, Taussig, Chousal, technicians)**
 - Scientists + subcontract + engineers + technicians + material and services = \$ 340* k
- **ALPS (Evans, Deranian)**
 - Atomic physics + modeling + material and services = \$ 60 k

Total = \$ 400 k same as FY2005

***A new window would cost ~ \$50k additional (design and hardware)**