

Boundary Physics Breakout Session was a Good Start

- Breadth of topics: many issues pointed out in three plenary talks: pedestal, SOL/div/PFC, and technology, were discussed
- Received substantial email input from individuals
- Appreciation that many phenomena (e.g. large ELMs, disruption, wall retention) are nuisances easy to cope with in today's experiments, but not so for ITER and even worse for reactor
 - Underscores the substantial nature of the boundary physics challenges in the step to ITER
- Group heard talks through lunch time, and thru a joint session with MHD on ELMs and disruptions, and came to some high level agreement on structure in discussion section

Insightful Talks in the Boundary Physics Breakout Session

- A. Leonard - “Boundary Physics Issues – View from the Pedestal Outward”
- D. Whyte - “Boundary Physics Issues – the View from the PFCs Inward”
- G. Bateman for CS Chang - “Role of the Center for Plasma Edge Simulation in Burning Plasma Research and Its Response to BPO questions.”
- P. Snyder for T. Rognlien - “Role of the Edge Coordinating Committee in Burning Plasma Research and Its Response to BPO questions.”
- J. Brooks - “PFC Community Response to the BPW Questions”
- G. Tynan - “UCSD MFE Experimental Program Group Response to the BPW Questions”
- L. Zakharov- “The Lithium Wall divertor Solution for ITER vs. the Present High Recycling Divertor”
- M. Kotschenreuther – “Does Divertor Control the Fate of Fusion?”
- C. Skinner - “Boundary Physics in the ITER Era”
- L. Baylor - “Fueling Needs and Capabilities for ITER Burning Plasmas”
- D. Dippolito - “Importance of Edge Physics in Optimizing ICRF Antenna Performance”
- D. Hillis - “Need for a Strong US International Collaboration Program to Address Burning Plasma Relevant Issues”
- D. Hill - “The Role of the USBPO in Boundary Research during the Next Decade”

Productive Joint Session with MHD Group and Final Discussion within Boundary Group

Joint session with Macroscopic Stability Group: “ELMs and Disruptions”

- ELMs 1-2 PM
- P. Snyder – review on ELMs
- M. Fenstermacher – “Control of the Pedestal and ELMs with Resonant Magnetic Perturbations and Research Needed toward a Burning Plasma Implementation”
- Disruptions 2-3 PM
- D. Whyte – review on disruptions
- J. Wesley – “Disruption Research Needed for Burning Plasma Preparation”
 - Breakout group leaders appreciated the timeliness of a near term Task Group for design of the Resistive Wall Mode Coils and the Resonant Magnetic Perturbation Coils for ITER (not discussed in boundary group, however – no time)

Formulation of answers to charge questions *3:15 PM (needed more time)*

Q#2: What issues remain to be resolved for a successful BP experiment in ITER

List of important topics (priority and exact wording not agreed on)

- Qualification of ITER PFC design, and research toward PFC staging strategy
- T retention and removal, including SOL transport
- Disruption mitigation
- Pedestal and ELM physics and control
- H-mode power threshold
- Plasma start-up, path to nominal regime, plasma shut-down, and afterglow phase
- Power exhaust
- Particle fueling and exhaust
- Long pulse operation (wall conditions)
- Fast particles loss to the wall
- Diagnostic integrity with baseline operation
- Remote handling capability in real situation
- RF-edge plasma interactions

Q#3: What are the consequences of resolving these issues, or not, in the next ~10 years?

Reduction of ITER performance and/or premature periodic stoppages for PFC cleaning or replacement!.

Q#4: What issues should be resolved by a successful BP experiment?

Q5: What contributions can/should the U.S. fusion program make to resolve these issues?

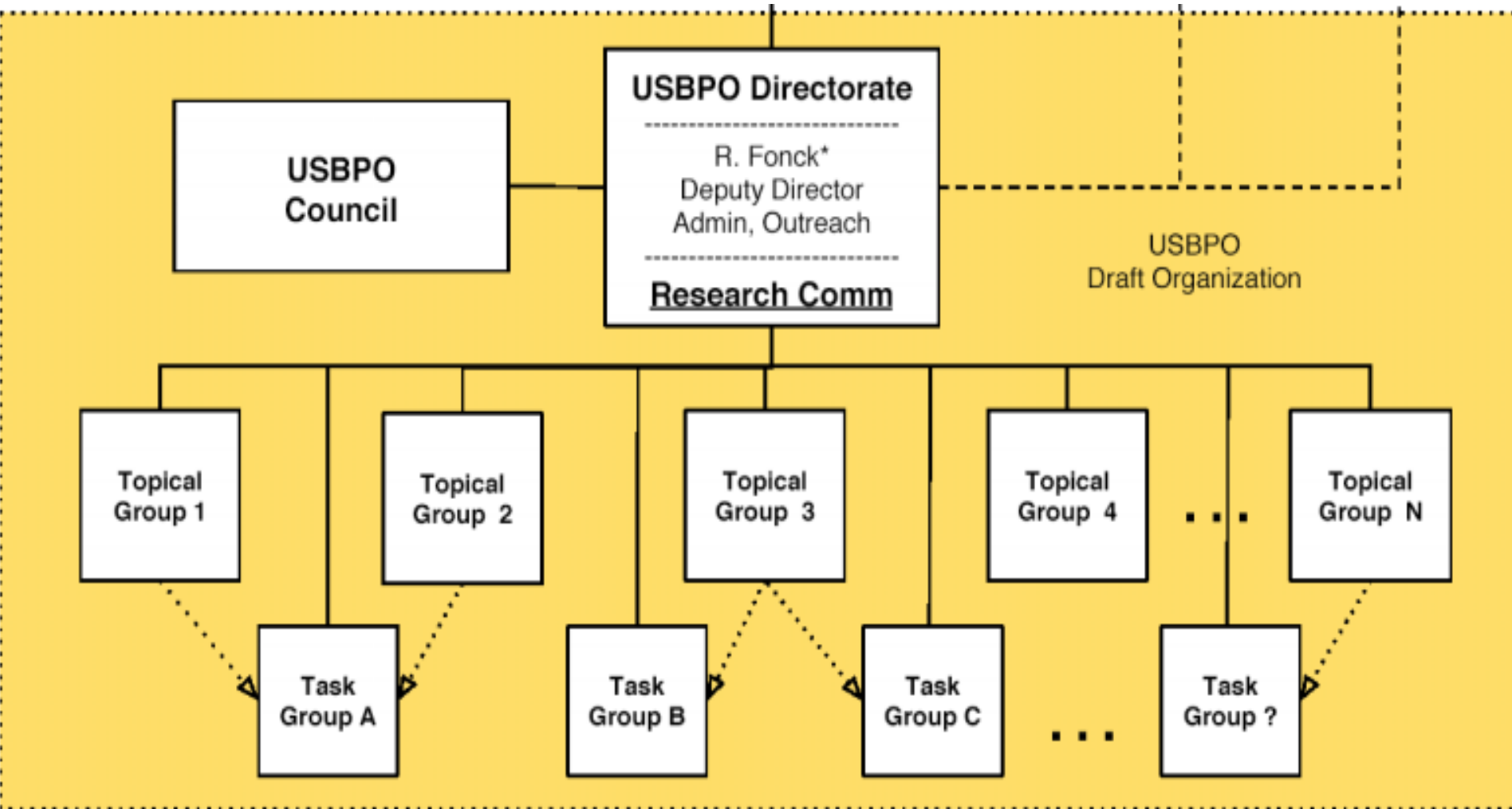
Not much dialog on these questions, because discussion of question #2 guided us to focus on Q#6, to discuss the framework of how we would decide on these two issues.

Q#6: How should the BPO be structured to best help the community make these contributions?

Two proposals for boundary structure within BPO:

- **Single boundary group with goal of integrated science, with subgroups in pedestal physics, SOL and divertor physics, and materials and PFC research**
 - **Pedestal physics would have analog to ITPA pedestal group**
 - **SOL and divertor physics would have analog to ITPA SOL and divertor group**
 - **Materials and PFC research would have analog in existing PFC program under VLT**
- **Three separate high level groups in pedestal physics, SOL and divertor physics, and materials and PFC research**
- **Hand vote showed proposal of 3 separate high level groups was favored by majority between 2:1 and 3:1**
- **Task forces could be formed by recommendation of working groups or research council (RC), pending approval by RC**

Possible BPO Structure

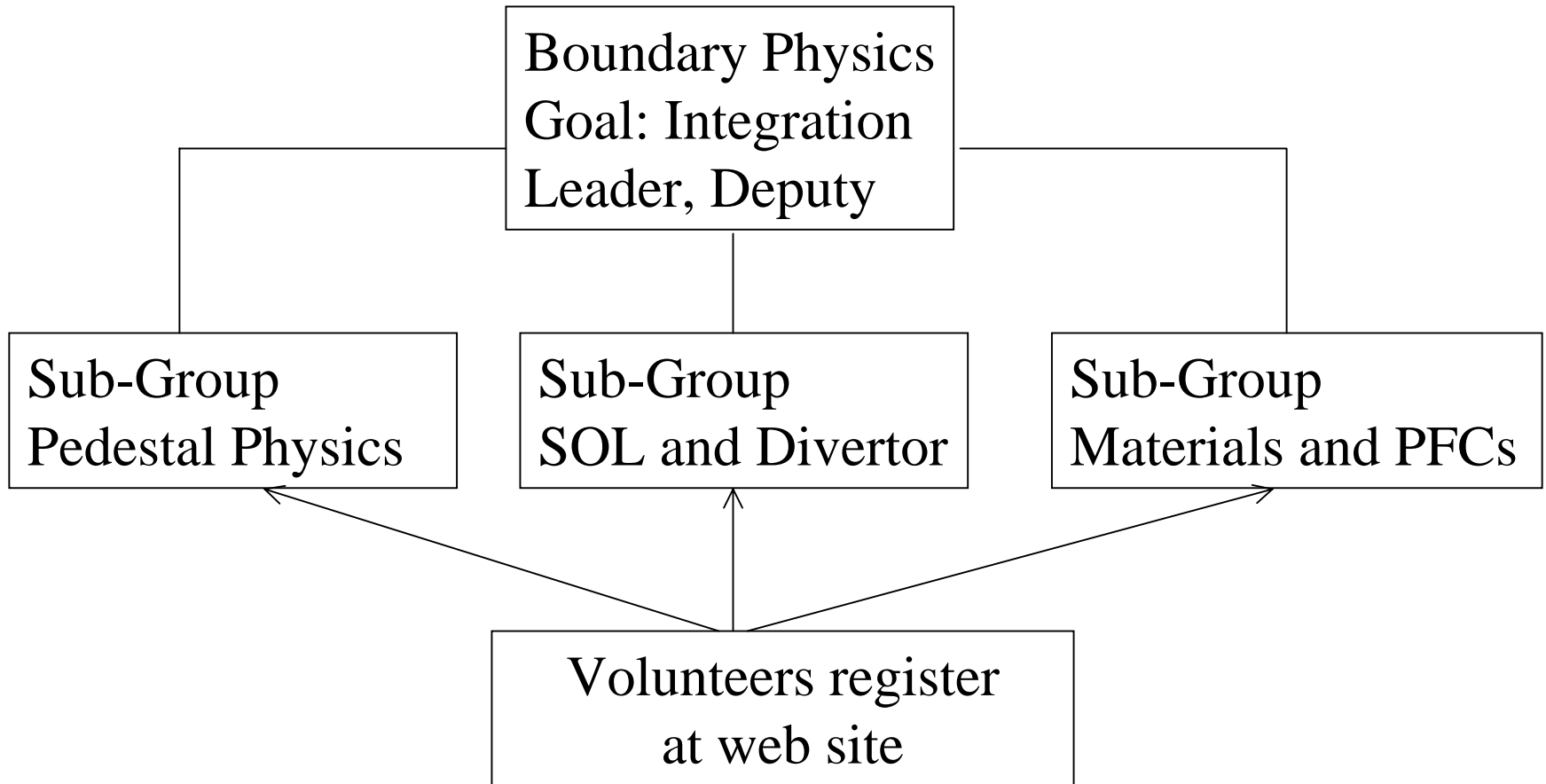


— Reporting Relationship
 - - - Coordinating Relationship



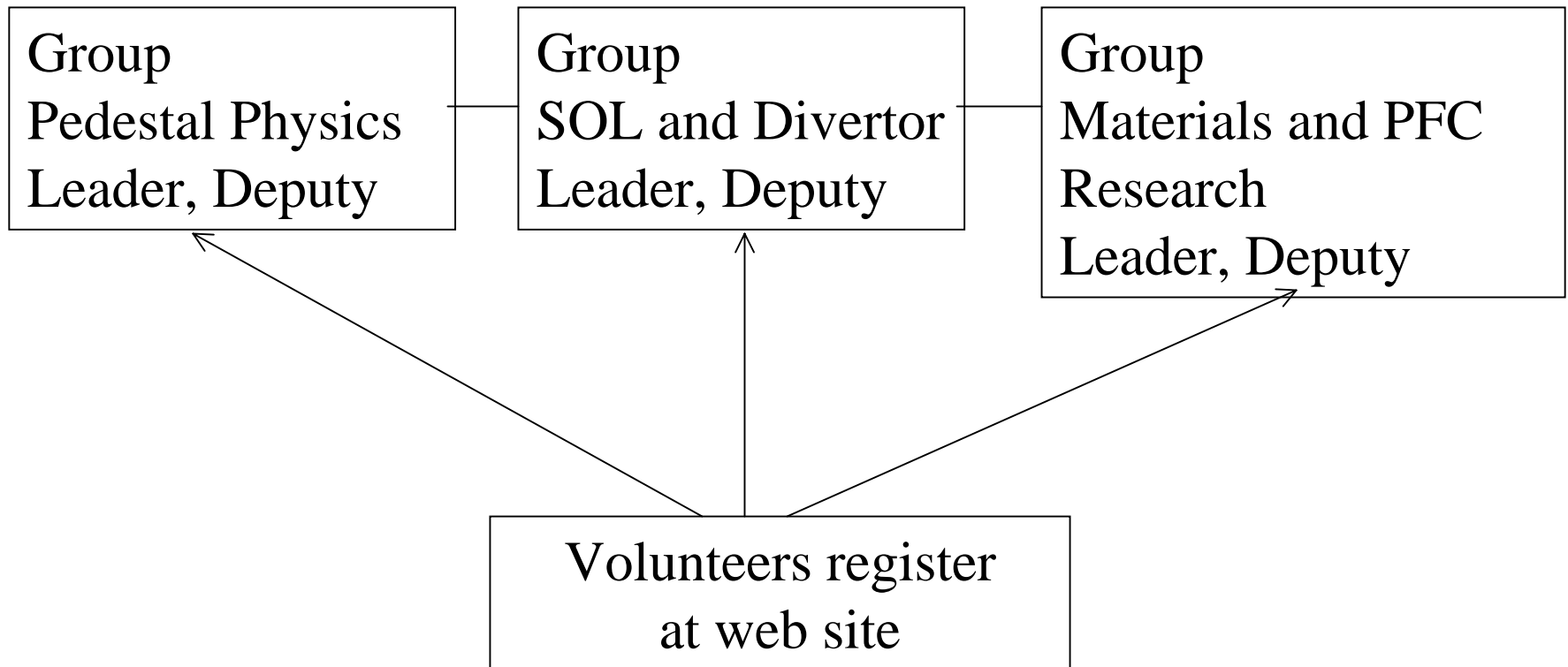
* ex-officio Council members

Possible Boundary Physics Structure within the BPO



- **Concern about isolation of pedestal physics from other groups**

Possible Boundary Physics Structure within the BPO Preferred by Majority of Attendees



- **Concern about ability to attack science issues regarding integration**
- **Task forces formed by recommendation of groups or research council, and approval by RC**