BES - CTS Divisional Planning

ENG Advisory Committee meeting
May 11-12, 2005

Discussion outline:
• CTS - BES Programs and people
• CTS - BES Priorities
• Issues
• Process
• Discussion
BES - CTS Divisional Planning

• Goals
  • Enhance coordination between disciplines
  • Enhance flexibility for disciplinary evolution
  • Better reflect the structure of the communities

• Issues
  • Internal structure and processes
  • External perceptions
CTS Programs and People

Chemical Reaction Processes
- Catalysis and Biocatalysis
  - Glenn Schrader (R)
- Process and Reaction Engineering
  - Maria Burka (C)

Interfacial, Transport, and Separation Processes
- Interfacial, Transport, and Thermodynamics
  - Bob Wellek (C)
- Separation and Purification Processes
  - Geoff Prentice (C)

Fluid and Particle Processes
- Particulate and Multiphase Processes
  - T.J. Mountziaris (R)
- Fluid Dynamics and Hydraulics
  - Mike Plesniak (R)

Thermal Systems
- Combustion and Plasma Systems
  - Linda Blevins (R)
- Thermal Transport and Processing
  - Al Ortega (R)
CTS Programs and People

• Administrative Officer – Saundra Woodard
• Center Manager – Johnetta Lee
• Division Secretary – James Murphy
• Program and Technology Specialist – Nichelle Coward
• Program Assistants – Yolanda Allen, Trenita Howard, Eric Jackson and Allison Thomas
• Other support – Bob Gage, Morris Ojalvo and Anita Yarbrough
CTS Programs and People

• **Chemical reaction engineering** (2004 portfolio = $60m) - Catalysis; Advanced materials processing; Electrochemical processing and electrochemistry; Reaction engineering; Biorenewable catalysis for the sustainable production of fuels and chemicals; Chemical process control; Chemical process design; Reactive polymer processing

• **Fluid dynamics and particle processes** (2004 portfolio = $57m) - Multiphase flow phenomena and transport in microstructured fluids; Particle technology (nanoparticles, granular flows); Multiphase transport phenomena in biological and environmental systems; Turbulence, hydrodynamic stability, and flow control; Rheology and non-newtonian fluid mechanics; Waves, hydraulics and environmental fluid mechanics; Micro-/nano- and bio-fluid mechanics
CTS Programs and People

• Interfacial phenomena and separations (2004 portfolio = $56m) - Interfacial phenomena for novel functional and other advanced materials; Mass transport of chemicals and biomaterials in materials processing; Phase equilibrium and solution thermodynamics for chemical processing; Novel non-reactive molecular processes; Novel material for chemical separations; Separation processes; Molecular engineering of chemical; biochemical and materials systems

• Thermal Systems (2004 portfolio = $49m) - Flame structure and dynamics; Structure and dynamics of industrial plasmas; Combustion pollutant formation and mitigation; Combustion- and plasma-based manufacturing and synthesis; Micro-/nano-scale transport phenomena; Multi-phase and interfacial phenomena; Convection in complex flows; Manufacturing and material processing
• Three clusters

• Biochemical Engineering/Biotechnology
  • Fred Heineken (C)
  • Lenore Clesceri (1/2 time)
  • Bill Weigand (1/3 time)
  • Mike Domach (1/4 time)

• Biomedical Engineering/Research to Aid Persons with Disabilities
  • Leon Esterowitz (C)
  • Semahat Demir (R)
  • Gil Devey (1/2 time)

• Environmental Engineering and Technology
  • Pat Brezonik (R)
  • Cynthia Ekstein (C)
  • Tom Waite (R)
BES Programs and People

- Administrative Officer – Joyce Simpson
- Science Assistant – Sunny Phelps
- Division Secretary – Eula Patterson
- IT Specialist – Marcia Rawlings
- Financial Operations Specialist – Sherri Swann
- Office Services Assistant – LaWanda Prailow
- Program Assistants – Toni Baker and LaTanya Darby
BES Programs and People

• **Biochemical engineering (2004 portfolio = $51m)** - Biomass engineering; Bioseparations; Protein and enzyme engineering; Quantitative systems biotechnology; Metabolic engineering; Tissue engineering

• **Biomedical engineering (2004 portfolio = $53m)** - Biomechanical engineering; Biomedical diagnostics; Biophotonics; Biomedical imaging; Disability research; Home care technology

• **Environmental engineering (2004 portfolio = $49m)** - Water resources; Water and wastewater treatment; Remediation; Pollution avoidance; Pollutant transport and fate; Air pollution control; Nanotoxicology; Environmental nanotechnology; Industrial ecology and materials use
CTS Priorities

• **Ideas** - CTS will lead engineering discovery and innovation in chemical and transport systems through increased investigator-identified and -defined awards.

• **Interdisciplinary Program** - CTS will enhance its support of interdisciplinary research through the creation of a CTS interdisciplinary research program.

• **Priority Areas** - CTS will enhance its impact in the following research areas: Nanoscale science and engineering, Safety and security, Smart manufacturing and processing, Environmentally-friendly and energy-focused processes and products.

• **People** - CTS will develop a diverse group of leaders within the chemical and transport systems community through faculty development and student education.

• **Organizational Excellence** – CTS will enhance its divisional operations and staff development
BES Priorities

• **CAREER** - BES program officers hold CAREER awards in high priority.

• **Unsolicited Awards** - As much as BES Program Officers hold CAREER awards in high priority, they also want unsolicited awards to have high priority.

• **BEB Cluster** - The BEB Cluster would like to see Quantitative Systems Biotechnology, Metabolic Engineering, and Small Group awards all be high priority.

• **BME/RAPD Cluster** - The BME/RAPD Cluster would like to see biophotonics, senior design projects, and multiscale modeling awards all be priority.

• **EET Cluster** - Unsolicited, CAREER, and CLEANER all are priority, and there also is a desire to fund some high-potential SGERS.
• **Program Content** - Define new programs to better serve and lead the communities.

• **Organizational/administrative structure** – Consider options related to programs, thrusts, priority areas, clusters, cross-cutting priorities, and interdisciplinary research.

• **People** – Responsibilities of existing PDs and staff.

• **Budgets** – Budget allocations, existing mortgages, solicitations, etc.

• **Name** – Various combinations include CBTE, BECT, CTBE, BCET, ...
Process

• ENG and division discussions on Thursday, May 5\textsuperscript{th}, 2:00 pm, Gallery II Hilton
• Combined BES/CTS meeting on Monday, May 9\textsuperscript{th}, 1:30 pm - 3:30 pm, Room 580
• ENG Advisory Committee input, May 11\textsuperscript{th}, 2:30 pm
• PDs recommendations on the content of possible programs
• Propose possible scenarios of division organization and administrative structure
• Decide division structure, program contents, PD responsibilities and staff activities
• Work out details of budgets, solicitations, and names
• Develop strategies for transition
Discussion

- ENG Advisory Committee input
  - Overall reactions to ENG concepts for reorganization
  - Input on internal aspects related to conceptual CTS – BES framework
  - Input on external perceptions related to conceptual CTS – BES framework
Budgets

• Division FY05 budgets – BES=$51m and CTS=$69m
• Division grant type
Budgets

• Division commitments
Priority Areas

- Priority area commitments
Award Trends

• Estimates of awards
Award Trends

- Estimates of awards

![Diagram showing estimated awards by division for FY06.]

- ENG Ave = 34,800
- ENG Ave = 31,000
# Award Trends

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<th>Division</th>
<th>’04 Actions</th>
<th>’04 Discretionary $</th>
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