DOE Perspective

Presented By

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Office of Fusion Energy Sciences
Office of Science
Department of Energy

ARIES Meeting
University of Wisconsin
April 22, 2002

Mission and Priorities of DOE

Secretary Abraham, October 24, 2001

Priority that deserves special mention.

- Unique contribution we can make to our energy and national security by finding new sources of energy—whether fusion or hydrogen economy or ideas not yet explored—we need to leapfrog status quo and prepare for future requiring revolution in how we find, produce and deliver energy
- Not simply because of the many usual reasons, but because success in this mission could well be one of the greatest contributions to our energy and national security for generations to come
- The Department should take this leadership role

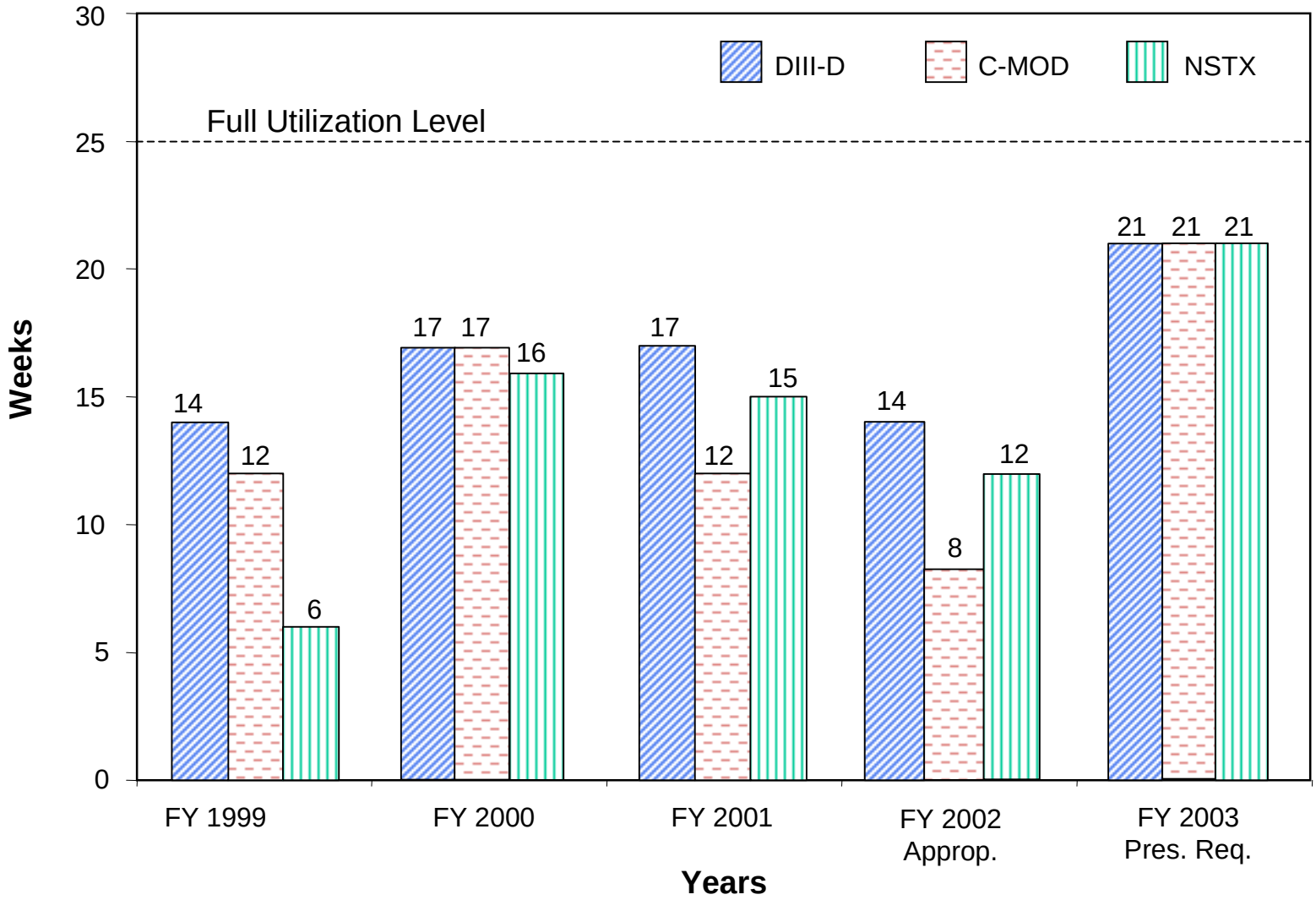
FY 2003 Fusion Energy Sciences Congressional Budget

	FY 2002	FY 2003
Science	137.4	142.5
Facility Operations	73.9	78.7
Enabling R&D	36.2	36.1
OFES Total	*247.5*	*257.3*
DIII-D	50.9	55.6
C-Mod	17.6	22.3
NSTX	26.8	33.1
NCSX	4.0	11.8

FY 2003 FES Congressional Budget Highlights

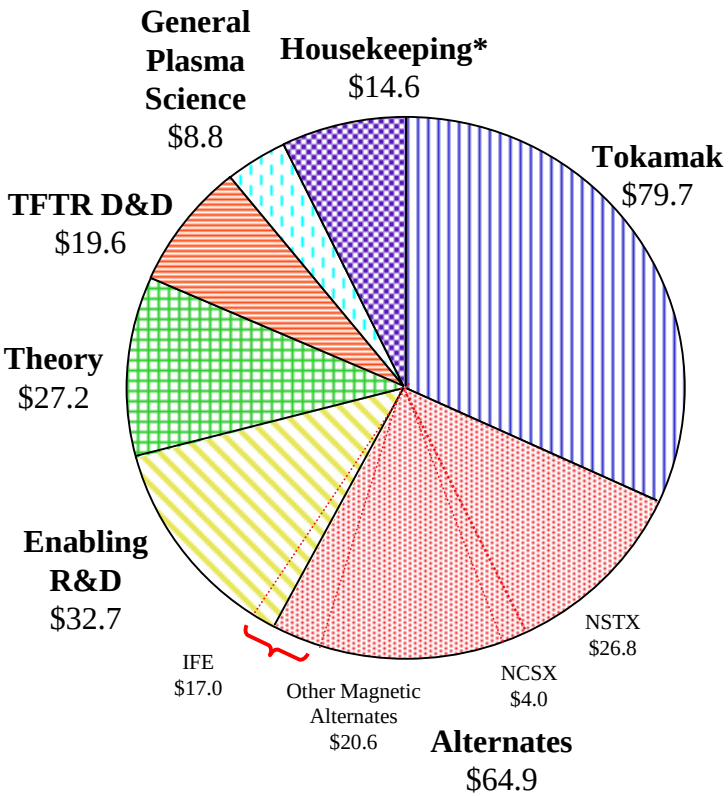
- Effective budget increase of $29.4 million
  - Actual increase $9.8 million
  - Completion of TFTR D&D yields $19.6 million roll-off
- Keep each program element as close as possible to FY 2002 level
- Increase operations at facilities to 85% of full, single shift
- Initiate NCSX project
- Pay “Housekeeping” Expenses
  - TSTA clean up ($3.0 million)
  - ORNL move to X-10 ($1.0 in FY 03

Major Fusion Facilities Operating Times

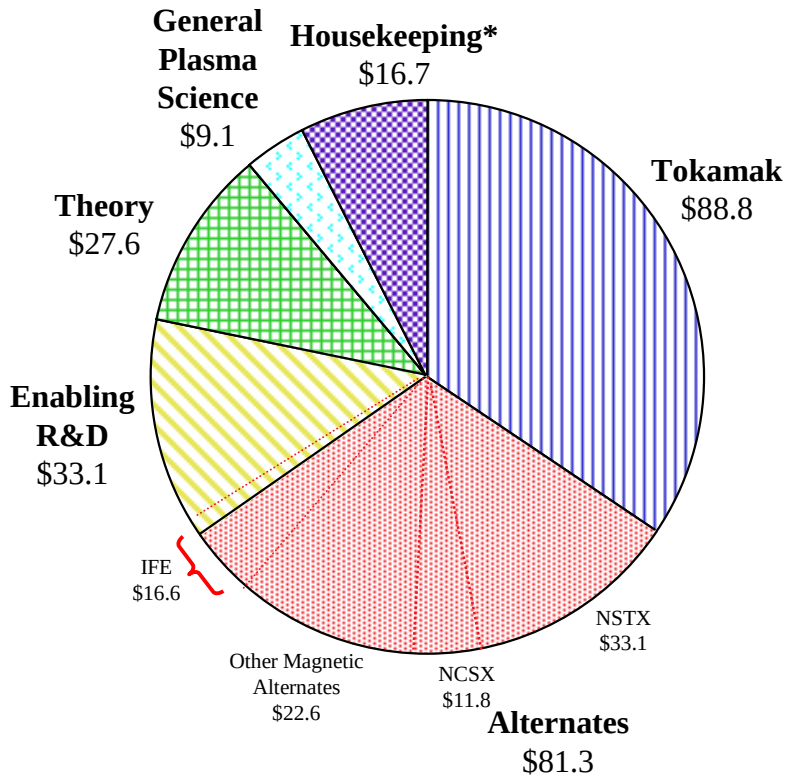


Fusion Energy Sciences Budget

FY 2002
December Financial Plan
$247.5 M



FY 2003
Congressional
$257.3 M

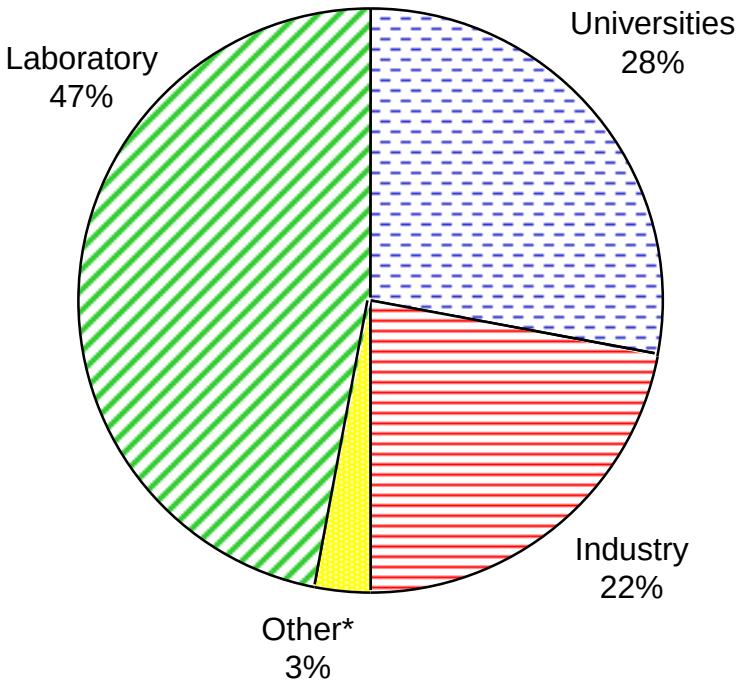


* Housekeeping includes SBIR/STTR, GPE/GPP, TSTA cleanup, D-Site caretaking at PPPL, HBCU, Education Outreach, ORNL Move and Reserves

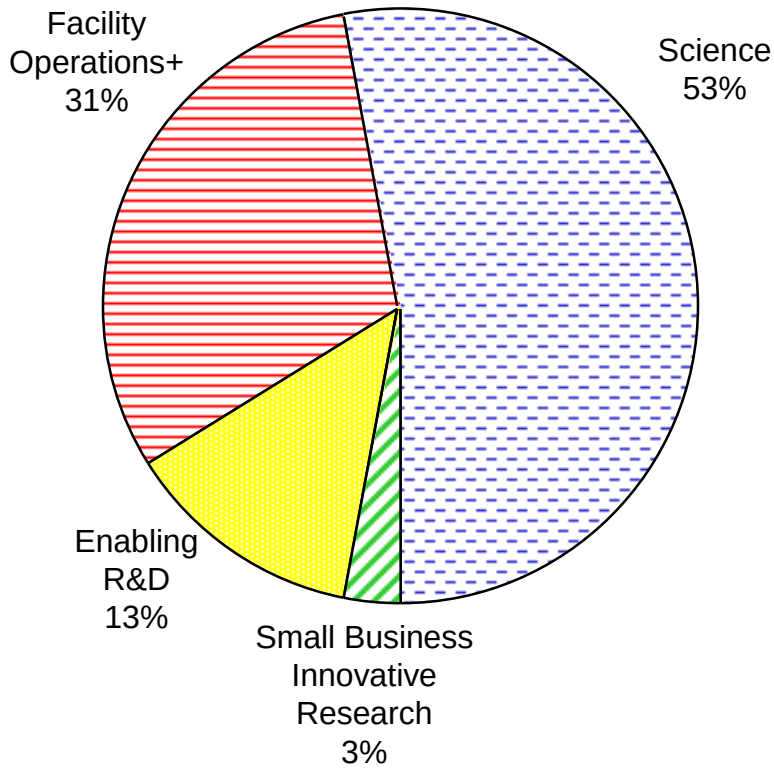
Fusion Energy Sciences Funding Distribution

FY 2003 President's Request
$257.3M

Institution Types



Functions

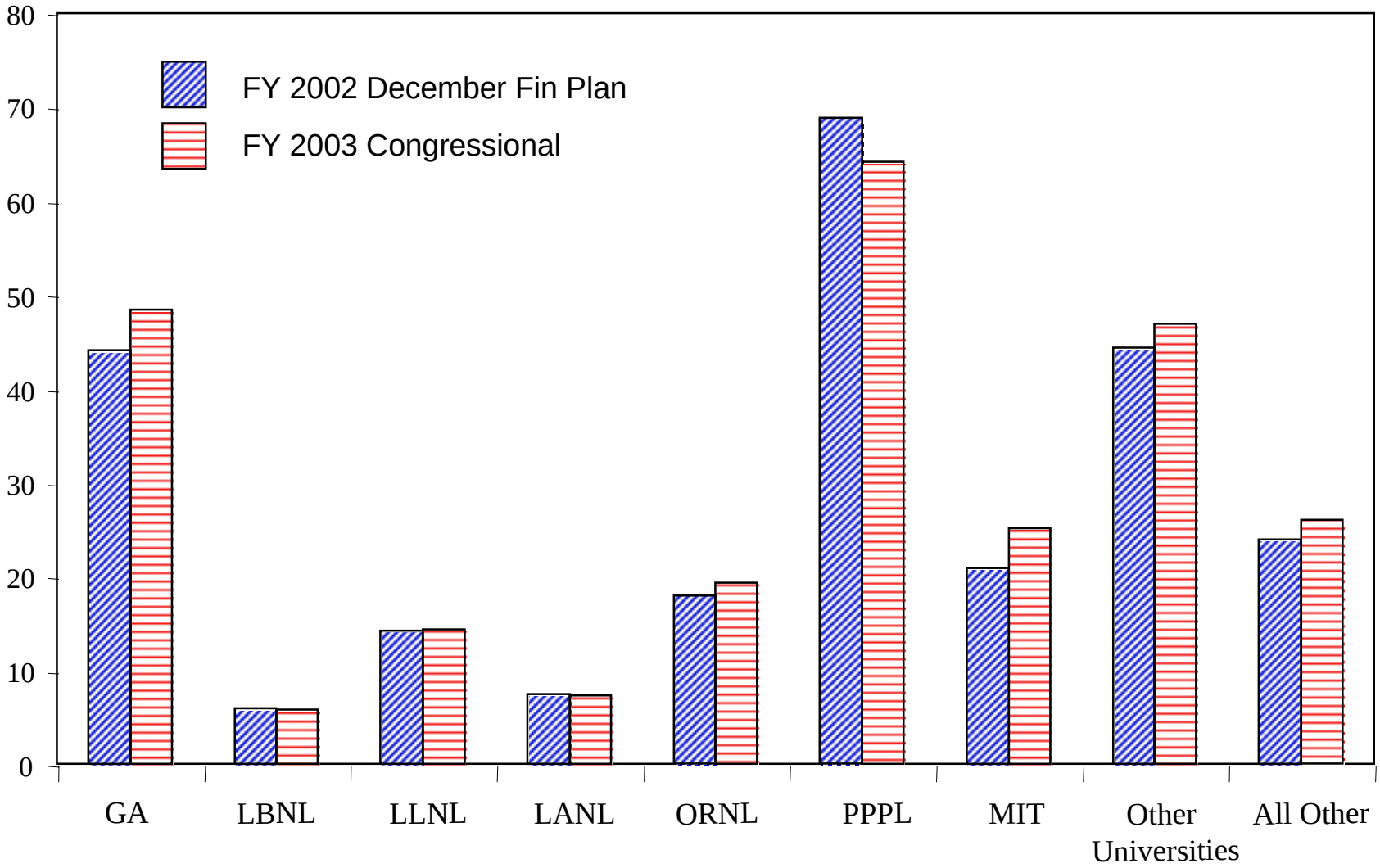


*NSF/NIST/NAS/AF
Undesignated

+Includes NCSX Project

Fusion Energy Sciences Funding by Institution

($ in Millions)



Status of TFTR D&D Project

- On schedule for completion by end of FY 2002
- Within planned cost
- The most challenging phase has been completed--cutting and removal of vacuum vessel segments and shipping to waste depository
- Several major activities remain to be completed

Three New Charges for FESAC

- Build on Snowmass results to recommend a strategy for proceeding with a burning plasma experiment

- Recommend roadmap for joint initiative between OFES and OASCR on integrated computational simulation and modeling

- Consider whether to broaden program scope and activities to include non-electric applications of intermediate term fusion devices

Burning Plasma Physics

- Establish a high-level panel to use Snowmass results to recommend a strategy for pursuing burning plasma physics experiments
  - Show how ITER could fit into U.S. program if we decide to participate
  - Show how FIRE or IGNITOR would fit into U.S. program if we do not join ITER
- Panel--(Chair Prager)
  - All interested FESAC members
  - Program leaders from major institutions
  - Selected others
- Report by September 2002
- NRC will review FESAC Recommendations by end of 2002

Integrated Simulation and Modeling

- Provide a roadmap for a joint initiative with OASCR
  - A 5-6 year program, costing about $20 million
  - Use the improved computational models developed by the base theory program
  - Significantly improve simulation and modeling capabilities
- Panel members (Chair Dahlburg)
  - FESAC members
  - Experts recommended by ASCAC
- Obtain fusion community input using workshops
  - Current status
  - Vision for simulation of toroidal confinement systems
  - New theory and math needed
  - Computer science needed
  - Computational infrastructure
  - Validation and use
- Summary report by July 15, 2002

Final roadmap recommendation by December 1, 2002

Non-Electric Applications

- Realizing the vision of fusion electricity requires long-range development effort (Chair McCarthy)
- Past studies have explored ways to use fusion to meet other needs not requiring the levels of physics and technology understanding needed for electricity production
  - Hydrogen production
  - High-energy neutrons for many uses, i.e. waste transmutation
- FESAC consider if program should be broadened to include non-electric applications of intermediate fusion devices
  - What are promising opportunities
  - What steps are needed to include these opportunities in program
  - What are the possible negative impacts and mitigation strategies
- Report by January 2003

Office of Fusion Energy Sciences

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IFE, University Liaison,

(Position Vacant)
Exploratory Concepts (Alts)

Curt Bolton
Next Step Options, Theory

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Atomic Physics, HBCU

Rostom Dagazian
C-MOD, Theory

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Theory Team Leader

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Program Support Specialist

Chuck Finfgeld
University Tokamaks

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Diagnostics, Education, Outreach

Erol Oktay
DIII-D, International Tokamaks

Don Priester
NSTX

(Position Vacancy)
Theory

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Chair, F&ETD Budget Committee
Fac. Ops/Expts, VLT, Magnets

Sam Berk
V-Chair, F&ETD Budget Committee, PFC, Plasma Chamber Sys, Materials

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Tritium and Safety, Education
Fac. Ops/TFTR D&D/Expts/GPP and IFE Technology

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Heating and Fueling, SBIR/STTR, Fac. Ops/GA ECH, US-JA PCM

Esther Ku
Assisting in Facility Operations and Enabling Technologies

Ray Schwartz◆
ESCH, Fac. Ops/Expts

(1 Position Vacancy)

Research Division personnel in leading rolls within F&ETD Program:

Next Step Options Leader:
Curt Bolton

(All F&ETD staff part of Budget Committee)

*On Call from SC-80

◆Principal Acting Director +On Assignment (Lehigh Univ.) **Dual Capacity *Support Staff

Changes at OFES

- Responsibility for studies transferred to Anne's Office
- I will be the Point of Contact; Esther will assist me
- Funding will continue to appear in the Enabling Technolgies sub-program
- More frequent interactions at Germantown

Advanced Design and Analysis Funding

MFE	FY 2002	FY 2003	
NSO	$3,125	$2,006	
ARIES-MFE	817	1,735	
Socio-economics	173	198	
Other	1,035	1,339	
Subtotal MFE	*$5,150*	*$5,278*	
IFE			
ARIES IFE	$1,128	$ 178	
Total Advanced Design	***$6,278***	***$5,456***	
ARIES	$1,945	$1,913	-5%
Socio-economics	178	198	+8%

Issues

- Total Budget
- MFE versus IFE Balance
- Future Socio-Economics Studies