

U.S. Fusion Energy Sciences Program

Presented to

Fusion Energy Sciences Advisory Committee

Princeton Plasma Physics Laboratory

By

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www.ofes.science.doe.gov

Excellent Science in Support of Attractive Energy

National Energy Policy

National Energy Policy



Report of the
National Energy Policy Development Group

May 2001

"The NEPD Group recommends that the President direct the Secretary of Energy to develop next-generation technology--including hydrogen and **fusion**."

OFES FY 2002 Budget Status

Request

House

Senate

\$248,495,000

\$248,495,000

\$248,495,000

OFES FY 2002 Budget Status

- o House

- o "The Committee recommendation for fusion energy sciences is **\$248,495,000**, **\$6,505,000 less** than the fiscal year 2001 funding level but the **same as the amended budget request**. The committee concurs with the National Energy Policy's assessment of the potential for fusion energy, but funding constraints prevent additional research funding at this time. The Committee has also provided **\$25,000,000** in the inertial confinement fusion program for **high average power lasers** which is complementary to the work performed in fusion energy sciences."

- o Senate

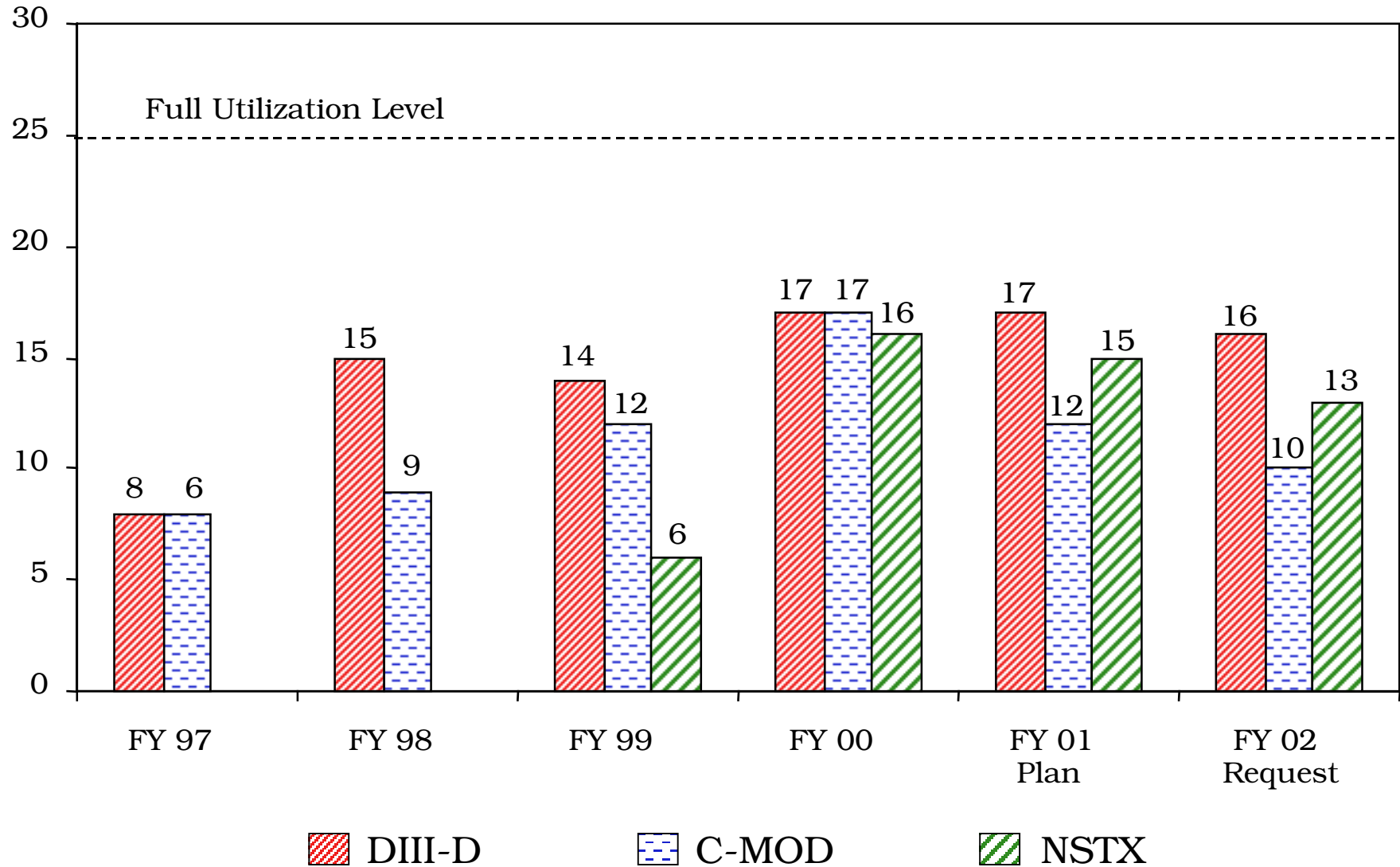
- o "The Committee recommendation for fusion energy sciences is **\$248,495,000**, the **amount of the request**."

- o Conference -- Expected in **September**

- o Expect \$248,495 level to mean **loss of ~100 positions** due to cost-of-living increases

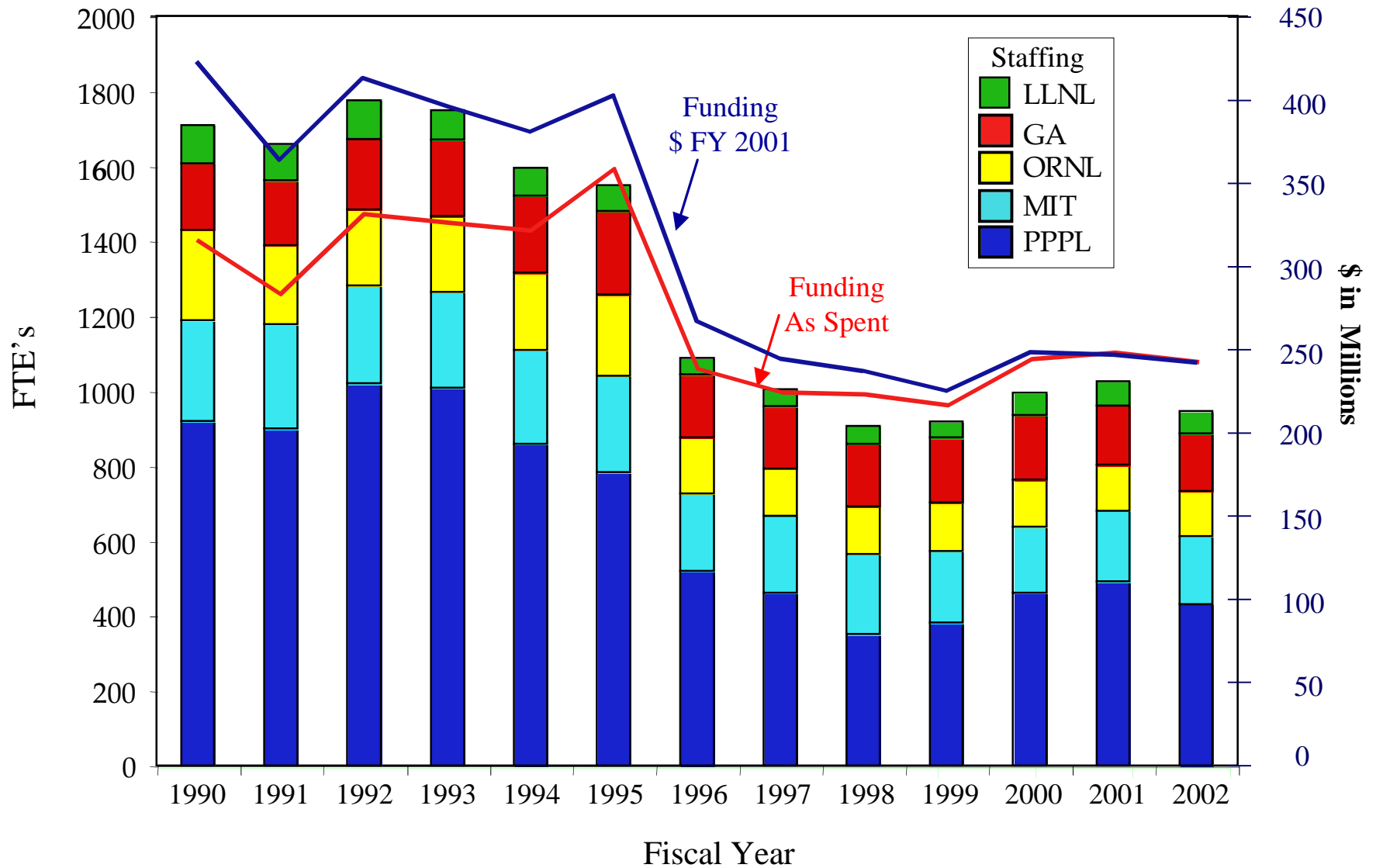
Major Fusion Facility Use

Based on \$248.5M



Staffing Trends at Major Fusion Contractors

Based on \$248.5M



FY 2002 Office of Science Budget Status

	FY 2001	FY 2002				
	<u>Appropriation[‡]</u>	<u>Request</u>	<u>Senate</u>	<u>+/-</u>	<u>House</u>	<u>+/-</u>
HEP	726.1	716.1	725.1	9.0	716.1	0.0
NP	369.9	360.5	373.0	12.5	361.5	1.0
BER	501.3	443.0	490.0	47.0	445.9	2.9
BES	1,013.4	1,004.7	1,040.7	36.0	1,006.7	2.0
FES	255.0*	248.5	248.5	0.0	248.5	0.0
ASCR	156.1**	163.1**	163.1	<u>0.0</u>	163.1	<u>0.0</u>
				104.5		5.9

[‡]The actual funding available to each program was reduced by a general reduction, funding moved to cover safeguards and security activities and an omnibus reduction

*Actual FES funding \$248.5

**A~\$2M fusion-related

Progress Report on Implementation of ITPA (International Tokamak Physics Activity)

- o ITPA Objective: **cooperation in development of physics basis of burning tokamak plasma**
 - Includes databases, modeling, analysis and workshops
 - Provides access to all relevant databases, including ITER, for all participants
- o Substantial progress since my last report to FESAC at the February meeting
 - **IFRC re-affirmed its support for ITPA** at its meeting on June 13, 2001
 - U.S. will use its bilateral agreements with Japan, EU, and RF **as legal basis for ITPA**
 - ITER Physics is **now a part of the broader ITPA**
 - The **first meeting** of the ITPA Coordinating Committee will be held in Japan in **early September** to elect a Chair and begin its activities
- o U.S. and EU have identified their members for the ITPA committees
 - While there are five 'core' members for each Committee, there is a wide interest in the U.S. for participation in this activity

Progress Report on Implementation of ITPA

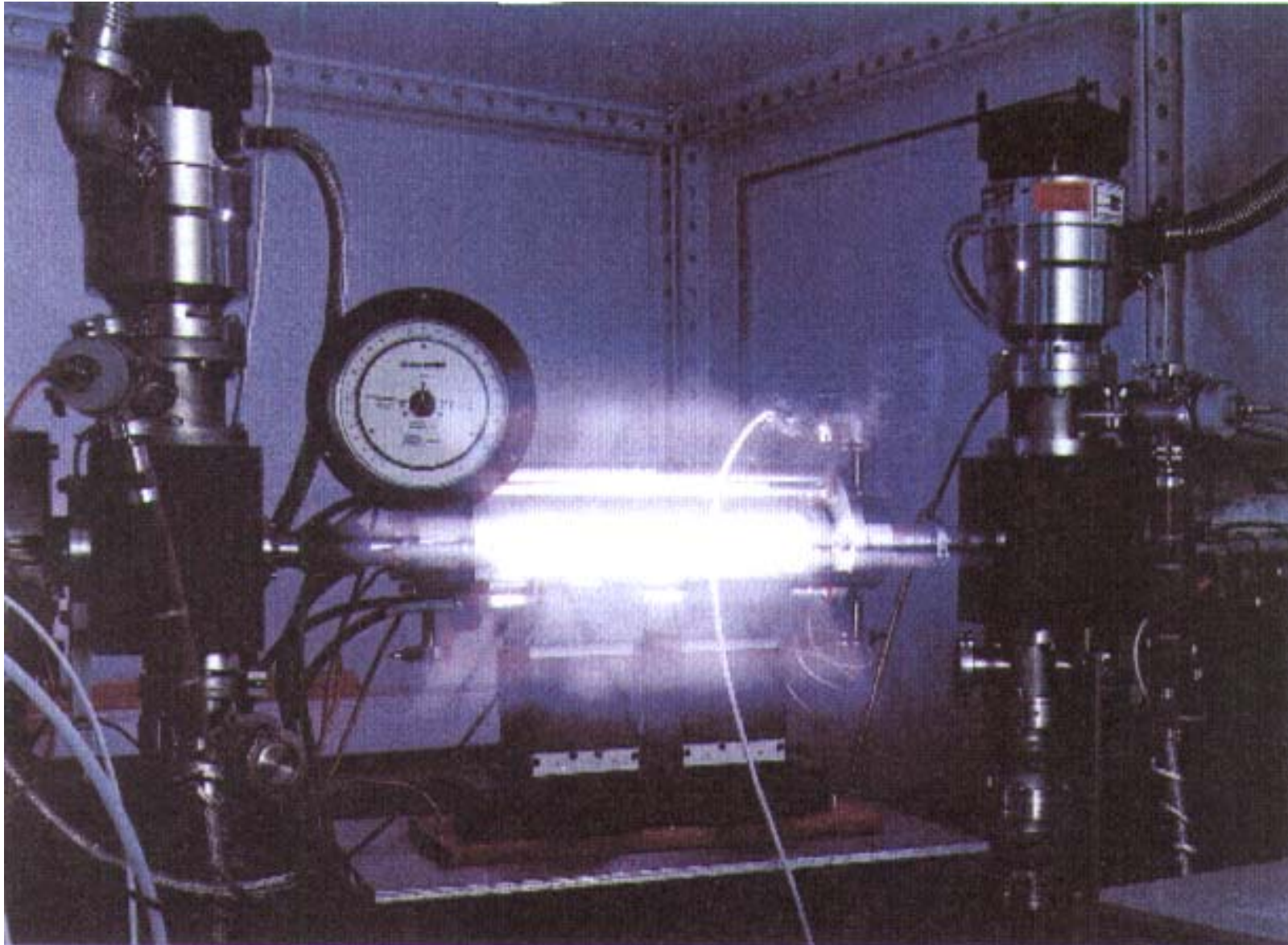
(continued)

- o U.S. is now involved in **planning of future international tokamak physics meetings**
- o We consider ITPA as **an important process to enhance our collaboration with the world fusion program on burning plasma physics**
 - Program leaders at universities and laboratories **should support** the participation of their scientists at ITPA activities
 - The core U.S. members of ITPA **should make** a major **effort to inform** other scientists of the ITPA activities

New Agreement Between U.S. DOE and the Federal Republic of Germany on Dense Plasma Physics

- o This new Implementing Agreement will establish a **joint bilateral technical program in the area of dense plasma physics**
- o This collaborative program will primarily be **carried out at the Gesellschaft fur Schwerionenforschung (GSI)** in Darmstadt, Germany. GSI is one of the world's leading heavy ion physics laboratories
- o The specific outcomes for this agreement include **research results** that will enlarge and amplify the existing science and enabling technology basis for IFE and related scientific areas of interest
- o The initial efforts will be focused on the **production and diagnostics of plasma conditions** required for the study of high energy density physics
- o This new activity will be the **first IFE collaboration with an EU member**. The EU has no official IFE program

GSI Experiment to Measure Energy Loss of Heavy Ions Passing Through Plasma



Comparative Review of Plasma Theory

- o **One-third** of theory grants up for renewal (approximately 10)
- o A total of **50 applications** received by July 13
 - ~\$4 M (No new money)
 - ~ 10 grants can be funded
- o Merit review process involving **60 reviewers** will be similar to last year's

Competitive Review of Advanced Diagnostics Development Program

- o Looking to **revitalize** the **program in flat budget scenario**
 - ~ \$2.6M (No new money)
 - < \$400k/per grant or lab proposal
- o All **currently funded** diagnostic-development programs are **being competed** for FY 2002 AND new submissions are encouraged
- o Proposals due **August 31, 2001**

Opportunities for Frontier Centers in Plasma and Fusion Science

- o Encouraging response to UFA solicitation for white papers--**six white papers received or expected**
- o Multi-disciplinary and multi-institutional centers would focus an integrated experimental/theoretical **effort to solve important problems** in plasma science
- o White papers received or in preparation:
 - Experimental and Theoretical Investigation of Astrophysical Plasmas
 - Center for the Acceleration of Particles in Collisionless Shocks
 - A Center for Magnetic Self-Organization in Laboratory and Astrophysical Plasmas
 - Multidisciplinary Center on Magnetic Reconnection
 - Center for Energetic Ion Dynamics
 - Center for Interdisciplinary Plasma Turbulence Studies

Under Secretary Card to Meet with AdCom Chairs

- o Date -- **TBD**
- o Discussion Points
 - Focus and key **issues**
 - Does DOE take **advice seriously**?
 - Recommendation on **approach to FES** and biggest opportunities
 - Thoughts on **managing science** and DOE **role** in science
 - DOE **performance compared** to other agencies
 - Names of others to meet, places to visit
- o Possible informal meeting with committee members