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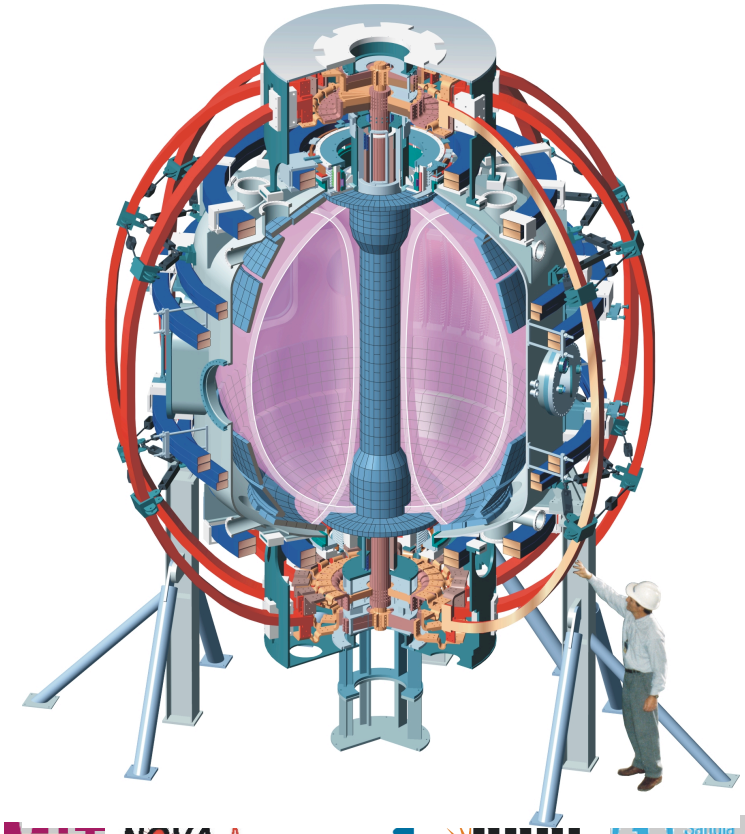
NSTX

NSTX Team Meeting

Feb. 6, 2003



Los Alamos NATIONAL LABORATORY

NOVA PHOTONICS

ornl

PPPL PRINCETON PLASMA PHYSICS LABORATORY

Sandia National Laboratories

UCLA

UCSD

UW

NSTX Monthly Team Meeting Agenda:Feb. 6, 2003, 1:30 - 3:00 in B318:

- o Departmental Items including budget: 1:30
- o ST development path update: 1:50
- o Engineering Activities: 2:00
- o Run Plan: 2:15
- o Research Updates & Plans: 2:25
- o Program Activities and Plans: 2:40

Adjourn by 3:00 pm.

Departmental Items

- Special session of safety meeting for researcher was very well attended!
- The safety record for FY 03 is thus far quite good! Let keep up the good job!

- 2003 spending is thus far is in line with the plan under CR.
  - An omnibus bill maybe passed in the near future.
  - Howver, let's plan for 12 run week at this time.

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• Jan. Issue of ES&H Newsletter is out. Please read it carefully.

• 2002 NSTX Annual Report found an author! Thanks to Mike Bell, a very good draft is ready!

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Secretary Abraham's Visit

"You are continuing that tradition of great science and great management with the National Spherical Torus Experiment, which I saw earlier today. Again, I was struck by the technology you've employed and the skill you've shown in managing the taxpayers' money."

FY 04 Presidential Budget (Flat with FY 03)

(ITER, Facility Utilization, Innovation, Plasma Science, …)

- If enacted, it (FY2003 - $33.1M, FY 2004 - $35.2 M) would allow
  - 21 run weeks
  - Some facility and diagnostic upgrades
  - Refurbishment and spare parts for facility reliability

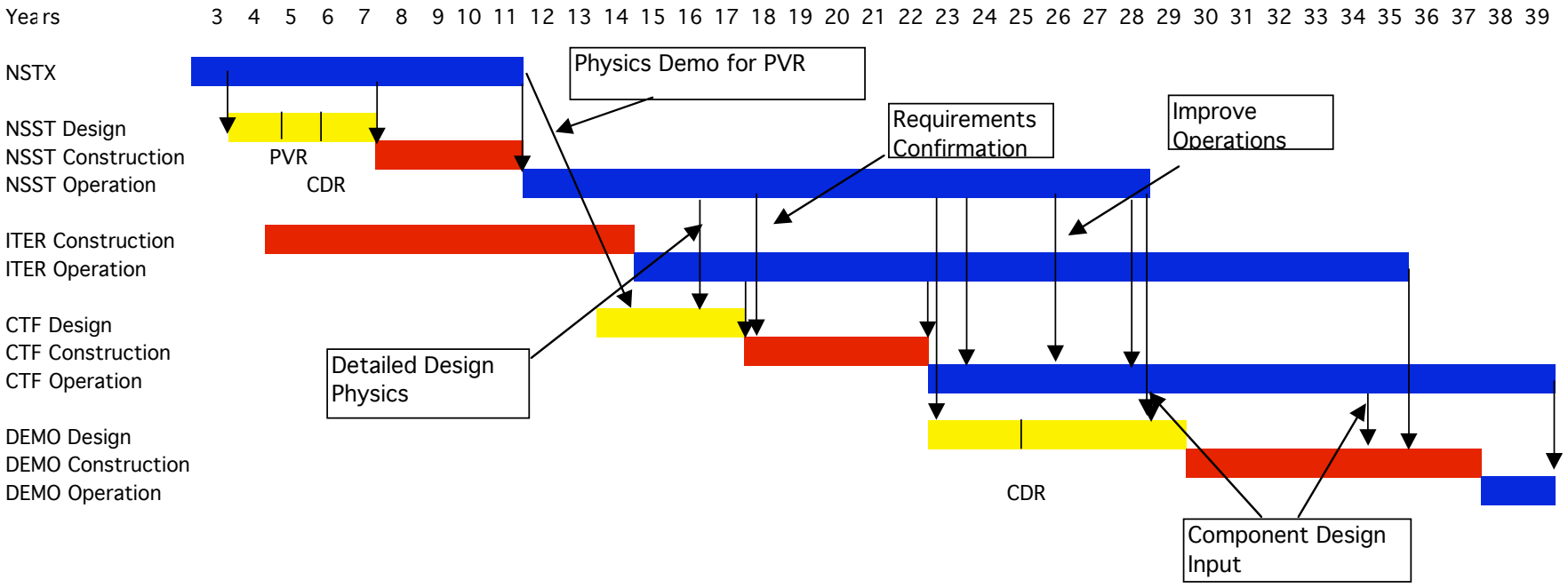
- The presidential budget is not far (~ $ 2 M) from the budget needed to carry out the 5 year plan (~ $ 37 M).

- However, as happened before there is a long way to go to see the outcome of the President's recommendations.

- We need to make a good case at the BPM as to what we will accomplish at this budget level.

Fusion Energy Development Path Defines Key Decision Points for ST

Spherical Torus



- CTF Facility to start operations around FY 23 to provide core components and high duty factor operation around FY 25 - 35 for Demo.
- NSST facility to start operations in FY12 to provide physics basis needed for the CTF construction decision expected around FY 18 and advanced ST physics scenarios for Demo design to start around FY 23.

ST Development Path
Contributing toward attractive Demo

Spherical Torus

I. PoP/CE facilities to develop ST innovations for attractive Demo

- Ultra-Low-Aspect Ratio ST (ST-Spheromak-boundary) - PEGASUS
- Practical non-OH plasma start-up method(s) - NSTX, HIT-II
- High performance PFCs (Liquid Lithium) - CDX-U
- Establishing ST physics principles at <T> ~ 1 keV range - NSTX, MAST

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II. A PE facility NSST (Next Step ST) to provide physics basis for Demo and CTF at fusion plasma parameters

- Explore high beta physics for attractive Demo (ST or tokamak)
- Provide physics basis needed for CTF construction

  e.g., ~ 5 MA non-ohmic start up and non-inductive sustainment

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III. A Compact CTF facility to provide technology basis for Demo

- Adequate neutron fluence and divertor heat load to develop attractive blanket and divertor modules.
- Low tritium consumption and longer term self-sufficiency (P_{fusion} ~ 70 - 250 MW)
- Minimize cost and optimize reliability through compactness and design simplicity
- Broadens BP operational database to widen parameter range

Critical ST Decision Points and Criteria

Spherical Torus

2006: NSTX Research Deliverables for NSST CDR

- Credible non-ohmic plasma start-up concept(s)
- Non-inductive sustainment
- Stability and Confinement basic understanding and scaling
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2018: NSST Research Deliverables for CTF CDR

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- Advanced ST operating scenarios

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- Alpha-physics at moderate to high beta
- Advanced ST operating scenarios

2025-2035: CTF R&D Deliverables for Demo

- High duty factor feasibility
- Reliable fusion core components