



NLC Thursday Video Conference Meeting, Jan. 24, 2002

Fermilab NLC Activities and Plans Update

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Fermilab NLC Activities and Plans Update

- FY02 Activities (and a bit before that)
 - RF Factory Improvements/Additions
 - Engineering Teams Implementation
 - Structure Production and Testing
- Future Plans



FY02 Activities: RF Factory Improvements/Additions

- Small vacuum furnace was installed and commissioned in September '01
 - Presently in use for structure subassembly production and brazing and bonding studies
- Improvements in RF measurement techniques and fixtures ongoing. Also, we are developing our RF calculations capabilities (hardware, software, and X-band experience)





FY02 Activities: RF Factory Improvements/Additions

- Large vacuum furnace presently under construction at AVS (Ayer, Mass.). Installation and commissioning will occur in March '02 and it will be utilized to produce FXA-003---our first structure fully produced at Fermilab.





FY02 Activities: Engineering Teams Implementation

Originally created to help focus on **Technical Division FY02-03 goals for Linear Collider R&D**. A further goal was to strengthen the FNAL/SLAC collaborative engineering effort.

For X-Band (NLC)

- **Fermilab RF Factory**
- **Structures (Mechanical)**
- **Structures (Electrical/RF)**
- **Girders**
- **Vacuum System**
- **Cooling Water System**
- **Specifications Development**
- **Quality Assurance Development**
- **8 Pack Integration**

Recall: **Fermilab's Linear Collider R&D Goal:**
By the end of 2003, complete the R&D work leading up to CD-1.

Both TESLA and NLC

- **FNAL Cleaning Facility**
- **SBIRs**
- **Permanent Magnets**
- **Demonstration of Remote Accelerator Operation**
- **Siting LC's near Fermilab**
- **Etc etc**



FY02 Activities: Engineering Teams Implementation

- 1st Structures (Mechanical) team meeting was held at SLAC in early December '01
- 1st Structures (Electrical) team meeting was held at SLAC in mid December '01
- 1st Girders team meeting is planned for this coming Wednesday , Jan. 30, at SLAC
- FY02 Budget includes 180 FTE-days at SLAC, much of which is in support of engineering teams implementation



FY02 Activities: Structure Production and Testing

- Completion of FXA-001
 - Construction completed in September 2001
 - Mechanical and RF testing completed in November '01
 - Vacuum/outgassing testing in progress
- FXA-002 Production underway
 - Construction to be finished by the end of this month
 - All testing to be completed by the end of February 2002





Goals for FXA-002 & FXA-003 and Beyond

- We intend to:
 - make FXA-002 and FXA-003 “the same but better than” FXA-001,
 - make ~1 structure / month rather than ~1 / year,
 - make FXB series structures for high gradient testing,
 - make FXC series structures good enough for the NLC Main Linac,
 - make two girders with nine 0.6 meter long structures on each girder in support of the Eight Pack Test.



Structures for Eight Pack Test

- Eight Pack Test at SLAC (Dave Schultz)
 - In Phase II, a “pack of eight klystrons” will feed
 - 11.424 GHz X-Band power into
 - a modified DLDS system and
 - power two girders worth of structures
 - with the full power and energy required by the NLC design.
 - The (impossible) goal is to be done by the end of FY03
- Girder A: 9 High Gradient 0.6 m long Test Structures (FXBs)
- Girder B: 9 NLC Main Linac 0.6 m long Structures (FXCs)



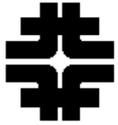
The (Fermilab) Plan for X-Band Structures

- In FY02 (with \$1.95M)
 - Make FXA-002 and FXA-003
 - 20 cm long, conventional machined, high gradient tests, 45 mm OD
 - Make FXB-001 thru 003
 - 60 cm long, conventional machined, high gradient tests, 61 mm OD
 - Use the race track with elliptical iris coupler design used on H60VG3
 - **Deliver FXB-001 to SLAC in May for high power testing at NLCTA**
 - Start to order parts for FXC
 - First Pass NLC Main Linac Design >>> Almost the Real Thing
 - 60 cm long, assume diamond turned, real accelerators
 - Note: Need FXC design (including couplers) by July 2002



The (Fermilab) Plan for X-Band Structures

- In FY03
 - Make FXB-004 thru 006 (plus two extras)
 - Assume better coupler design than we had in FY01.
 - Make FXC-001 thru 006 (plus two extras)
 - See how many we actually have in mid to late FY03 and decide what to do in FY04



Conclusion

Significant progress has been made in the past year at Fermilab in development of our infrastructure and its capabilities. We look forward to more fully participating and contributing to the ongoing work in the NLC R&D Project collaboration in the future.