The Goal

- The goal is to be inclusive - a national facility meeting all testing requirements for beta=1, beta<1, and CW modules, and bare cavities

Advantages of the Meson Lab

- Available cryogenics
- Available space, including a long beam line
- Available power

Disadvantages of the Meson Lab

- We have to clean up the Meson East area - This is almost complete
- Space is very tight for the full facility
- Cryogenics is not adequate for the full facility
- The building is not exactly a show place

The disadvantages have forced us to make a major change in the plan. Distributing the test facility
SMTF @ Fermilab

Meson Lab 1
SMTF @ Fermilab

M-East in September 2004
SMTF @ Fermilab

M-Polarized in September 2004
SMTF @ Fermilab

M-East in February 2005
SMTF @ Fermilab

M-Polarized in February 2005
SMTF @ Fermilab

Existing Cryogenic Power

- Three satellite refrigerators operating as liquefiers
  - 4000 liters LHe inventory + equal gas storage + controls
  - Total power equivalent to ~ 90 Watts at 2 K
    - We are assuming 60 watts @ 2 K available
    - Remainder for 5 K shields
    - Higher temperature shields cooled with LN2
- Low temperature via vacuum pumping on helium
  - Two vacuum pumps each capable of >10 g/sec @ 20 torr (2 K)
  - Transfer lines are presently close to needed locations
SMTF @ Fermilab

Refrigerator
SMTF @ Fermilab

Complete Layout in ME & MP
The space is crowded

- Difficult to fit everything in even at this early planning stage
- The CW and the Single-module test facilities do not exist in Meson
- Space limits shielding that may be required for full Photo-injector operation

Scheduling simultaneous tests is not possible until a new refrigerator is operational

- Even with a CW area, there is no capability of an independent beam for CW module tests or for T<2K
- Full Photo-injector cannot operate > 1 Hz

Decide to change the plan

- Put the heavy cryogenic loads at a different place with a new refrigerator
- Leave the Single-module test facility and Proton Driver at Meson lab
  - Maintain the possibility of early tests
- Consider putting the bare-cavity test area at MTF
\textbf{SMTF @ Fermilab}

Outside New Muon Facing North
SMTF @ Fermilab

Inside New Muon Facing North
SMTF @ Fermilab

Inside New Muon Facing South
SMTF @ Fermilab

SMTF Layout at New Muon
SMTF @ Fermilab

SMTF Layout at Meson Lab
**SMTF @ Fermilab**

**Plusses & Minuses**

- **Plusses**
  - Enough space to do all the necessary testing; safe and expandable in all three areas
  - Photo-injector can operate indefinitely in showplace area
  - Maintain the possibility of early tests

- **Minuses**
  - Have to build a refrigerator and building very soon. It becomes critical.
  - Have to create a tunnel extension for Photo-injector
    - Simplifies radiation shielding

- **First tests**
  - Could be about the end of this year; A single-cavity module exists to test.