Final Remarks

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- **Charges (not in order):**

  5. Assess and comment on plans and progress toward a third-generation simulation and design study.

  3. Assess and give advice on plans for the Targetry R&D program, particularly the enhanced focus on international activities.

  1. Review and comment on the R&D progress achieved since the last MUTAC Review.

  6. Review and comment on the status and scope of the US involvement in the MICE experiment.

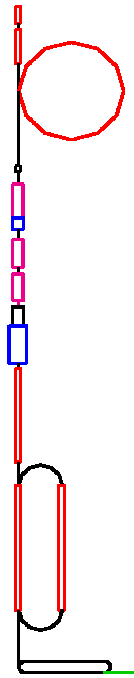
  4. Assess and comment on the relationship between Neutrino Factory R&D in the US and corresponding efforts in Europe and Japan.

  2. Review and give advice on the R&D plans and corresponding budgets for FY04, as well as on the long-range directions.

5. Assess and comment on plans and progress toward a third-generation simulation and design study.

- **Study I** **Emphasized Feasibility**
- **Study II** **Emphasized Performance**
- **Study IIa** **Emphasize Lower Cost → Study III while Maintaining or Improving Performance**

Review Study 2 Costs



p Driver
Hg Target

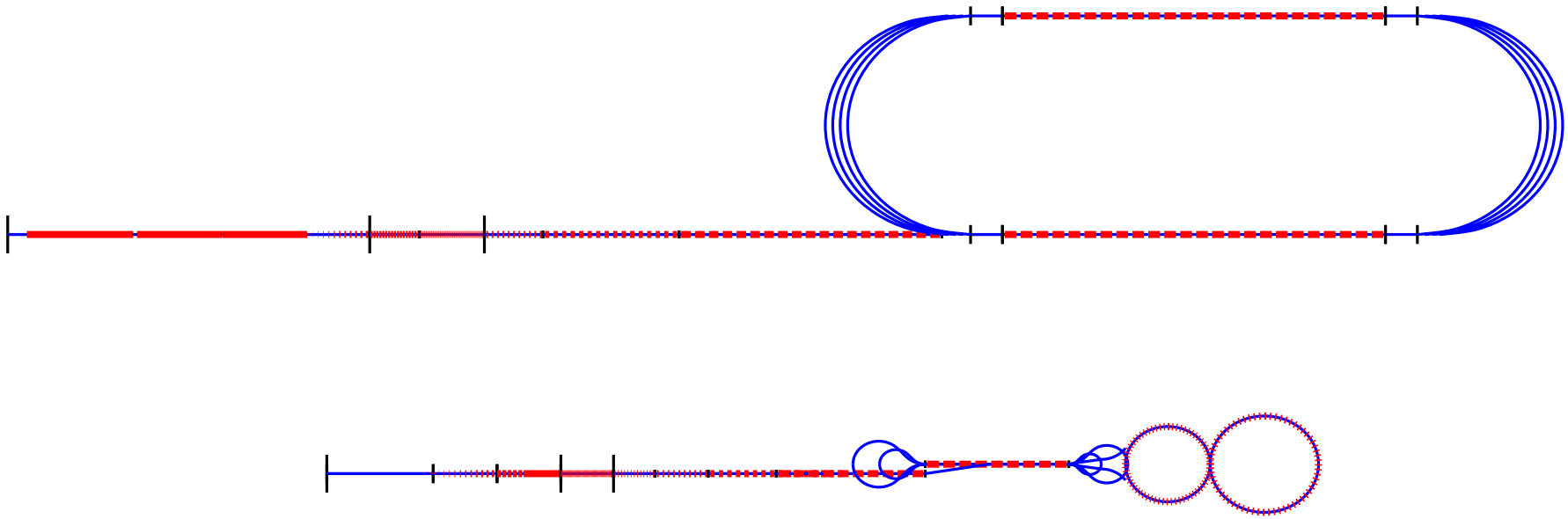
% of 1.8 B$ Cost (no EDIA etc) without driver or target

Phase Rotation	(29 %)
Cooling	(23 %)
Pre-Acceleration	(14 %)
RLA Acceleration	(26 %)
Storage Ring	(8 %)

Neutrino Beam

Compare Study IIa with Study II

Work in progress: list and draw all needed components



Study	Beam line m	Acceleration m	B dl T m
II	6891	802	1649
IIa	1950	360	989
%	28	45	60

Expect Lower Cost and $\approx 2 \times$ Performance

Similar muons/proton, but of both signs

3. Assess and give advice on plans for the Targetry R&D program, particularly the enhanced focus on international activities.

Target Experiment at CERN

AGS Experiment E951 had good result with 4 Tp
but we need a further experiment

- **With intensity corresponding to 4 MW at 15 Hz (30 Tp)**
- **Minimum required magnetic field (15 T)**
- **Required jet diameter and velocity (1cm & 20 m/s)**
- **Location at BNL no longer an option**
- **CERN seems almost ideal : (30 Tp, 24 GeV, low emittance)**
  Pulse $2\ \mu s\ >\ 3\ nsec$**, but CERN exp showed no difference** $<\ 4\ \mu s$
  - **LOI submitted**
  - **Very encouraging response**
  - **Proposal sent**
  - **Tight time line**
  - **Requires impulse of collaboration funding**

1. Review and comment on the R&D progress achieved since the last MUTAC Review.

MUCOOL

- **Experimental Area finished**
- **Absorber about to be filled with liquid hydrogen**
- **RF Studies in Magnetic Field**
  - **Radiation at 805 MHz imply ok for MICE**
  - **Maximum field with magnet less than desired (scaled from requirement in real channel)**
  - **Planed study of materials & coatings with removable button**
  - **200 MHz Cavity under construction**
  - **'Coupling' SC Solenoid to surround 200 MHz, stalled for lack of funds**

- **Must continue 805 MHz studies in magnetic fields**
- **Must start 200 MHz studies**

6. Review and comment on the status and scope of the US involvement in the MICE experiment.

Muon Ionization Cooling Experiment (MICE)

- **Solid Design based on Study-2 channel**
  (Similar components to RFOFO cooling ring)
- **International Collaboration: (US, Europe, Japan)**
- **Proposal has Scientific Approval at RAL**
- **Funding proposal sent to NSF, (& in Europe & Japan)**
- **A positive indication would help international process**
- **Support from MUTAC/MCOG would be helpful**

4. Assess and comment on the relationship between Neutrino Factory R&D in the US and corresponding efforts in Europe and Japan.

- **Annual International NuFact Workshop & School** (20-30 students) **Cycles Europe-US-Japan**
- **MICE with CERN, Italy, Japan & UK**
- **MUCOOL has active involvement of Japan & UK**
- **Target Experiment with Japan, UK, & CERN**
- **"World Design Study" with CERN, Japan & UK**
- **FFAG Design Studies with Japan also Canada & France**
- **Non scaling Electron FFAG Model with Japan**

- **Separate study of Factory with no cooling Japan**
- **Separate study of Factory based on 2 GeV Linac Driver CERN**
- **Separate study of Beta Beam CERN**

- **Much international collaboration**
- **No obvious duplication**

2. Review and give advice on the R&D plans and corresponding budgets for FY04, as well as on the long-range directions.

- **Trying multiple funding sources**
  - **CREDA for High Pressure RF Studies**
  - **EPSCoR Mississippi-BNL Funding for Weak Focus Cooling Ring Experiment**
  - **ICAR Illinois initiative (although its future is now unknown)**
  - **NSF for Cornell SCRF and other University support**
- **But we are severely constrained by the DOE funding cut by factor of two (2.8 → 1.4 M$) in 2003**

In Particular

- **Hard to mount Target Exp. and keep MUCOOL healthy**
- **'Coupling" Solenoid to surround 200 MHz stalled**
- **MICE preparations, prior to MICE funding, at risk**

- **Last year MUTAC wrote**
  "An additional $1M would make a considerable difference"
- **This is still very true**