Wrap-up
and
Action Items

$$Q_{Talk} \propto \frac{}{Q_{Banquet}}$$

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CENTER FOR BEAM PHYSICS

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MICE Collaboration Meeting–Frascati
June 28, 2005

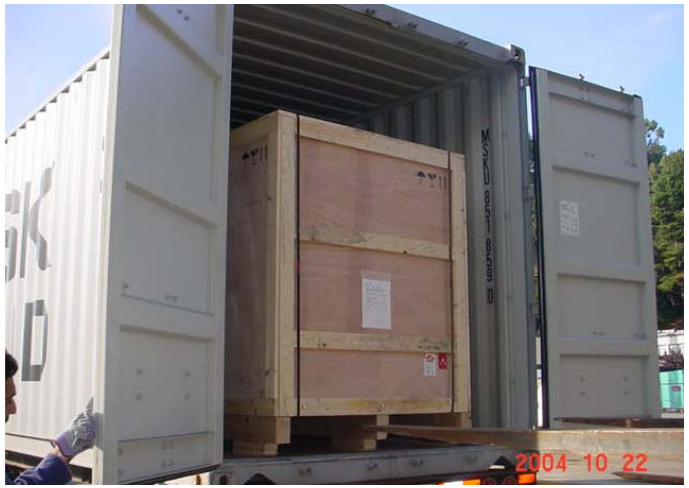
Outline

- Introduction
- Items from Technical Board
- Cooling Channel/Beamline Issues
- Detector Issues
- Simulation and Controls Issues
- Final Remarks

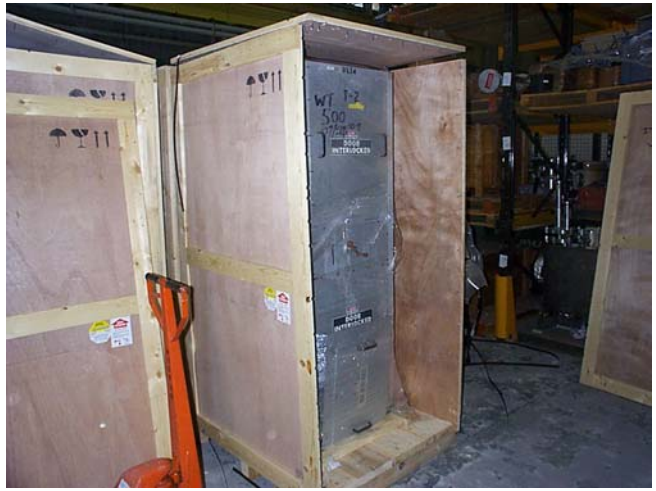
Introduction

- It is nice to see continued progress on many fronts
  - progress on preparations for KEK test run
  - engineering of components and interfaces being refined
  - LBNL RF power equipment being refurbished at Daresbury Lab (and looks okay)
  - 201 MHz cavity fabrication essentially complete
  - plan for getting U.S. funding from MC is proceeding
  - MICE is now a recognized CERN experiment (RE11)
  - INFN proposal will be submitted on July 12
  - about 60 participants attended this meeting!

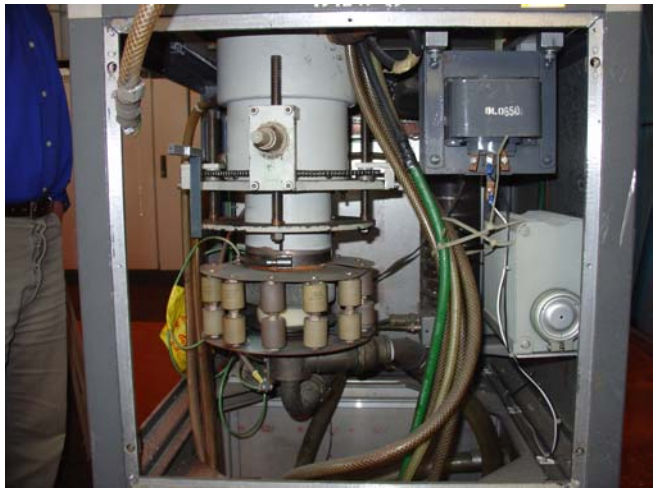
Introduction



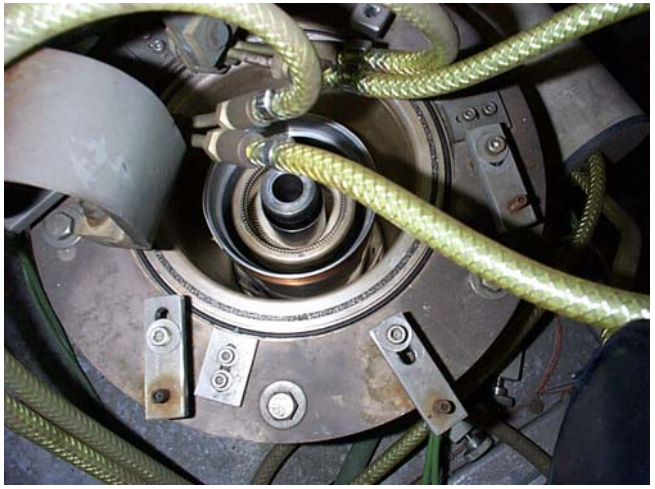
Leaving LBNL



Unloading at Daresbury



Inspection at Daresbury



Tube socket (4616)

Introduction

- Plans being developed for future MICE Collaboration meetings
  - October 22–24, 2005 at RAL
    - parallel sessions on October 21 (hopefully)
    - Executive Board meeting on October 25
  - February/March in Japan (no details yet)
  - May or June in U.S.
    - insist on pre-meeting test of air conditioning!

Introduction

- Should we coordinate with CARE/BENE and/or International Scoping Study (ISS) meetings?
  - CARE/BENE meeting at CERN, November 23–25, 2005
  - ISS should have 3 meetings prior to NuFact06
    - October '05, January'06, April'06 are about the right times
    - could imagine correlating the first two with our meetings, e.g., October at Imperial College, January in Japan, April in U.S.
- Goals for this meeting
  - launch DAQ group
    - what, if any, electronics is not in hand and must be ordered?
    - need to check compatibility of KEK test system with MICE time structure and data rate
  - evaluate where we stand with design and safety review
  - define experimental method for measuring/unfolding resolution effects

Introduction

- understand forces and support issues for Step IV
- finalize beam line shielding needs
- evaluate PSI solenoid cooling system plans
- verify diffuser system design meets rapid-changeover criterion
- examine status of TOF purchase and testing
- develop a run plan

Items from Technical Board

- Berkeley action items
  - update TRD to reflect latest changes √
  - prepare for KEK beam test √/2
  - resolve beam line shielding and access to TOF0 √
  - define responsibilities for tracker module radiation shielding and magnetic shielding √
  - flesh out details of DAQ system, including event definitions √/2
  - refine target design (reproducibility, radiation tolerance, identification of failure modes) √/2
  - define required diffuser thickness and procedure for adjusting it √
    - do we need to turn off magnets to change diffuser ⇒ ~2 hours
      - how long is it permissible to work in high magnetic field?

Items from Technical Board

- develop strategy, deliverables, and plan, for H_2 system R&D ∫/2
  - create documents in preparation for review (July 15)
  - plan for hydrogen R&D review in October 2005
  - request MICE dry run before review
  - is labview system the best approach to implementing controls (double work?)
- progress in collecting design and safety documentation slower than desirable
  - must take this more seriously
- resolve need for segmentation of magnetic shield (weight issue)
  - Green to re-evaluate tracker module weight
- deal with cost increase on decay solenoid cryo system

Cooling Channel/Beamline Issues

- Matching calculations indicate some scraping in channel; identify where and examine consequences
- Revise optics in beam line matching section to account for material (and different central momenta)
- Interlock RF cavity voltage with detector rate alarm
- Run tests on HTS leads to assess heat load
- Revisit absorber operational scenarios (cool-down time ≈40 hours)
  - complete RFP on Focus Coil by September '05
  - force calculations
    - evaluate abnormal settings (incorrect polarity, wrong excitation)
      - consider case where coupling coils powered independently
  - define alignment scheme for RFCC module
  - define motion tolerance for components under magnetic forces

Cooling Channel/Beamline Issues

- evaluate effects of differential heating of RF windows (room temperature and LN temperature) √/2

- Optics solution for "Step V.0" is okay in non-flip case, but limited to ≈140 MeV/c in flip case

- Magnet issues
  - FCs can quench passively (3 in series okay)
  - verify quench properties of spectrometer solenoids (by RAL meeting)
  - check need for additional power filtering to improve quench tolerance
    - quench recovery a few hours; initial cooldown 8 hrs
  - consider implications of quench with people in hall (e.g., during diffuser changes

Cooling Channel/Beamline Issues

- Engineering issues
  - must top hat wall for tracker patch panel be thin? (probably not)
  - is 30 minute diffuser changeover an operational necessity?
    - is 30 minutes from data stop to data start?
    - complete and document study on alternative diffuser positions
  - must link blocks for magnetic shield be lined up with cold-mass supports of spectrometer solenoid?
    - need to choose between modified patch panel and gussets on cryostat
  - update support drawings for spectrometer to reflect present concept
    - need to accommodate VLPC cryostat mounting system

Cooling Channel/Beamline Issues

- do we need second iron shield for step 2 or 2.5?
  - is local shielding a viable option?

Detector Issues

- TOF
  - need to prepare for design/safety reviews
  - understand why muons in TOF system all at ±100 μm
  - need to decide on phototube size for TOF1 and TOF2 (1.5 or 2 in.)
  - need to test system at high count rate with random pulser
    - idea of using ISIS synchrotron for random test suggested
  - need to verify availability for phototubes for calorimeter

Detector Issues

- Spectrometer solenoid
  - prepare change control request for modified coil geometry
    - verify tracking, optics, and cost implications
  - evaluate need for 4 supports for magnetic shield
    - magnetic forces on cold-mass supports (use I_{max})
  - update drawing to reflect proper support configuration
  - need to keep KEK magnet "alive" as a backup option in case LBNL magnets are late

Detector Issues

- Detector supports
  - check compatibility of proposed system with floor-support system
  - should detectors be grounded or floating?
  - what patch panels and cabling supports are needed?
  - note that man-lift likely required for maintenance and/or installation

Simulation and Controls Issues

- Congratulations to

  Yağmur Torun, Analysis Forum Coordinator
  Malcolm Ellis, Software Tools Coordinator

- DAQ group has been formed and is functioning (workshop at RAL proposed)
  - do we really need a two-level event builder?
  - need to clarify interface with safety systems
  - define relationship between slow controls of detector and beam line

The main action items from this software meeting were:

- finish the work in progress toward use of G4MICE for monitoring and analysis of KEK test beam data (Malcolm)

This includes alignment, calibration, decoding, a monitoring application with visualization and zero-field track reconstruction

Simulation and Controls Issues

- station spacing study for tracker (if Malcolm has time)
- carry out large statistics production to provide lots of muons for various analyses
- develop the optics and analysis packages further (Chris)
- validate EMCal simulation through comparison to KLOE data
- continue study of efficiency, purity and bias (Rikard)
- clean up/reorganize the code that builds the cooling channel and fields (Chris, Rikard, Yağmur)
- follow up on physics in GEANT4 (Rikard)

  N.B. triggered by Bill Murray's claim at NuFact that dE/dx and/or multiple scattering in the latest version of GEANT4 (which we aren't using yet but were planning to switch to) is broken

- implement spill structure in simulation, in consultation with the DAQ group, as soon as they have a reasonable description

Simulation and Controls Issues

- continue study of muon distributions through MICE to validate acceptance of PID detectors (Yağmur)
- update model of Cherenkov detectors (?)
- make progress on global track matching and PID (Aron, Malcolm, Rikard, ...)
- catch up in documentation and tests

Final Remarks

- We made good progress since Berkeley
- Identifying and attacking the key issues
- It is very important that we stay visible in both the HEP and accelerator communities
  - preparation of meeting abstracts, soliciting talks and seminars, etc. is very important to our "health"
    - keep eyes open for opportunities
    - new publications committee (DK) will help
- Continue to fill in the identified holes in the design…and the funding!
  - plans for U.S. funding being developed
- We look forward to further discussions with MANX proponents as the ideas for the experiment are refined
- MICE management continues to be grateful for the quality (and quantity) of your work

Final Remarks

642 days until first beam!

See you at RAL!