MICE Project
Progress and Planning
Finance & Funding Phase 1

- UK position is now clear
  - Covers muon beam and tracker contribution
  - Hydrogen and Absorber R&D, RF R&D for phase 2
  - Deliver phase 1 ⇨ unlock phase 2

- Tracker
  - Solenoid – baseline plan...
    - US-MuCOOL/MICE funding plan
    - Timescale is compatible with phase 1 plans (just)
  - SciFi (US/JP/UK) - electronics is an outstanding issue

- PID
  - TOF / Cherenkov1 & 2 / EMCAL...

- DAQ discussions - Encourage detector & instr. workshop
Beam Line

- **Target**
  - **Design evolution**
  - **Design criteria**
    - MICE – 1 Hz, 1ms
    - Environment parameters being established

- **Diagnostics**
  - Benchmark test
  - Prototypes at KEK
• Optics
  – Being revised

• Power supplies
  – comparing with TS2 power supply procurement

• Mechanical: stands & vacuum chambers
  – Concentrated on target
  – Critical items needed in Synchrotron room
    • S7 – parts made
      – Trial build
      – Procure valve... (target group needs to decide)
    • Pion capture beam line and stands (2) prior to solenoid
Beam Line

• Controls
  - Propose VME/PC running Linux
  - EPICS based controls / graphical control ...

• Services
  - Water – closed loop chillers
    • 100kW for solenoid
    • 100kW for beam line
    • 100 kW for RF (phase 2)
    • 100 kW for all other.... (phase 2)
  - need to establish A/C capability
Decay Solenoid

Decay solenoid
delivery due end summer 2005
design of rail and stand
basic tests in hall
vacuum, pipework; coils

Decay solenoid cryogenics
delivery ~1 year
order still to be signed*
Spectrometers

• Tracker
  - On track
  - KEK tests september

• Solenoids
  - Assumed US supply (according to MuCool plan)
• **Shielding**
  - had initial discussions
  - resolution by end july

Access is an issue...
PID group...
space
magnetic fields
Representative Field map

~ Typical field values

~2T hand

4T on axis

~0.4T body

These values are ok for short periods (meaning minutes) ⇒ time trials

REDO WITH CORRECT GEOMETRY AND COIL CURRENTS

These values are ok for short periods (meaning minutes) ⇒ time trials
Safety Review(s)

MICE is somewhere here!

Task List:
- Target
- Beam line
- ToF Stations
- Cherenkov Stations
- Calorimeter
- Spectrometers
- solenoid + tracker

Hall layout

R&D: Hydrogen & Absorber
R&D: RF@DL
Task time-line:

2005:
- Introduce decay solenoid in hall - testing
- Modifications to solenoid stand
- Installation of a hydrogen test area in hall 5.2 & tests

Late 2005:
- S7 swap
- Test target – few pulses at start-up 2007

2006:
- Installation of cryo-system for decay solenoid
- Shutdown 2006
- Install shielding
- Install stands etc in synchrotron

Late 2006:
- Rail system, beam line stands, b-l elements

Spring 2007:
- Install detectors
- First beam

Late 2007:
- Install spectrometer
Time scales

• Permissible to submit prior reviews at any time
  – Better to coordinate (groups of related things)

• Depending on scale of risk
  – reviews can be internal
    • ISIS engineer/safety group/RPA
      – e.g. Synchrotron target
      – MICE should review fit for purpose
      – ISIS will review acceptability
  – or reviews will be external
    • Hydrogen system – ISIS external-industrial -SNS ...
    • Three months notice
    • Bookmarked October for Hydrogen system
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<tr>
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<th>Tasks</th>
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<tr>
<td>Q1Y05</td>
<td>Introduce decay solenoid in hall - testing</td>
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<td>Modifications to solenoid stand</td>
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Already been caught out – because of time pressure
TOF phototubes,
Cryo for decay solenoid,
hydrogen system,

- fast track specs past TB
- does not circumvent D&S reviews but minimises risk!
By the next CM (autumn)?

- What should we have achieved...
  - Taken delivery of & tested the decay solenoid
  - Ordered decay solenoid cryogenics
  - Installed S7
  - Be close to finalising prototype target
    - target can still be developed while MICE is running...
      - Subject to a minimum spec
  - Designed and ordered shielding
  - Start design of stands and vac chambers
  - Submitted design review for hydrogen
  - ...

...by the next CM?

- What should we have achieved...
  - ToF progress...
  - Cherenkov progress...
  - Ecal progress...
  - Tracker progress...
    - tests completed at KEK
    - discussed VLPC electronics loan from DØ
...and phase 2?

- **Cavities**...
  - R&D in MuCool – funding dependent
- **Coupling Coil**...
  - funding dependent
- **Absorber**
  - R&D in phase 1
- **Focus Coils**
  - Design ok - subject to phase 2 bid¹
- **RF Power**
  - R&D in phase 1 – still funding dependent¹ (phase 2)
and now for something completely different...