

University
of Glasgow

MICE General Status

MICE Oversight Committee

RAL, 15 October 2014

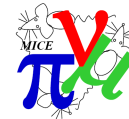
**Paul Soler
on behalf of the MICE Collaboration**

Agenda of meeting



- MICE Oversight Committee meeting agenda
 - 11:45-12:15: MICE General Status (P. Soler)
 - 12:15-12:45: Focus Coils at reduced current and reconfiguration of MICE Step V (V. Blackmore)
 - 12:45-13:00: Discussion
 - 13:00-13:45: Lunch
 - 13:45-14:15: MICE Step IV Finances and Schedule (A. Grant)
 - 14:15-14:45: MICE Final Step Forward Look (R. Preece)
 - 14:45-15:00: Discussion

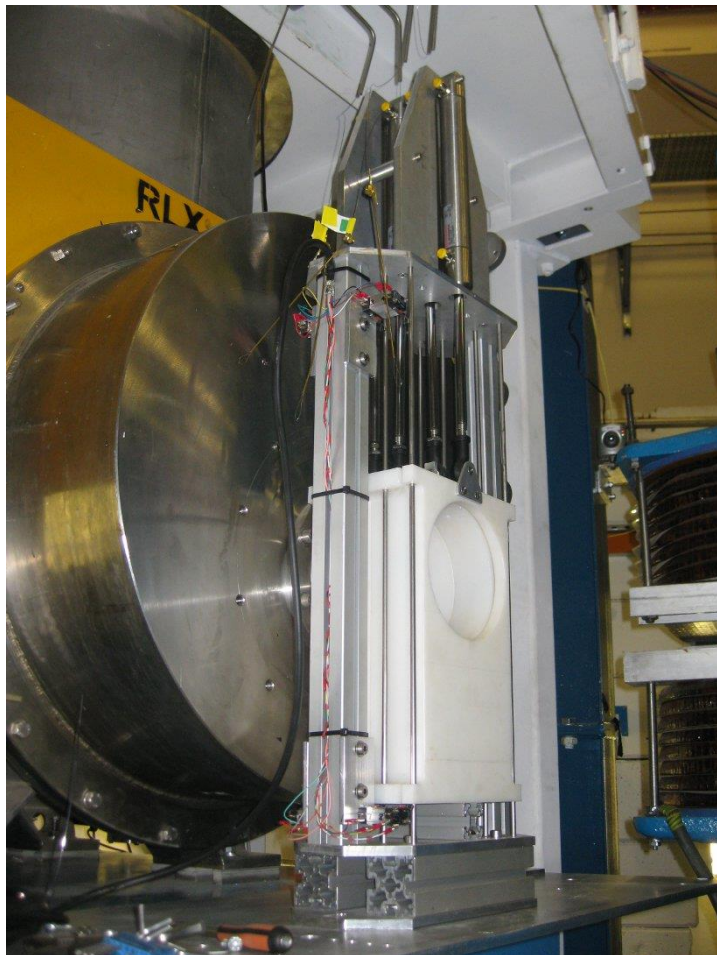
General Status: summary



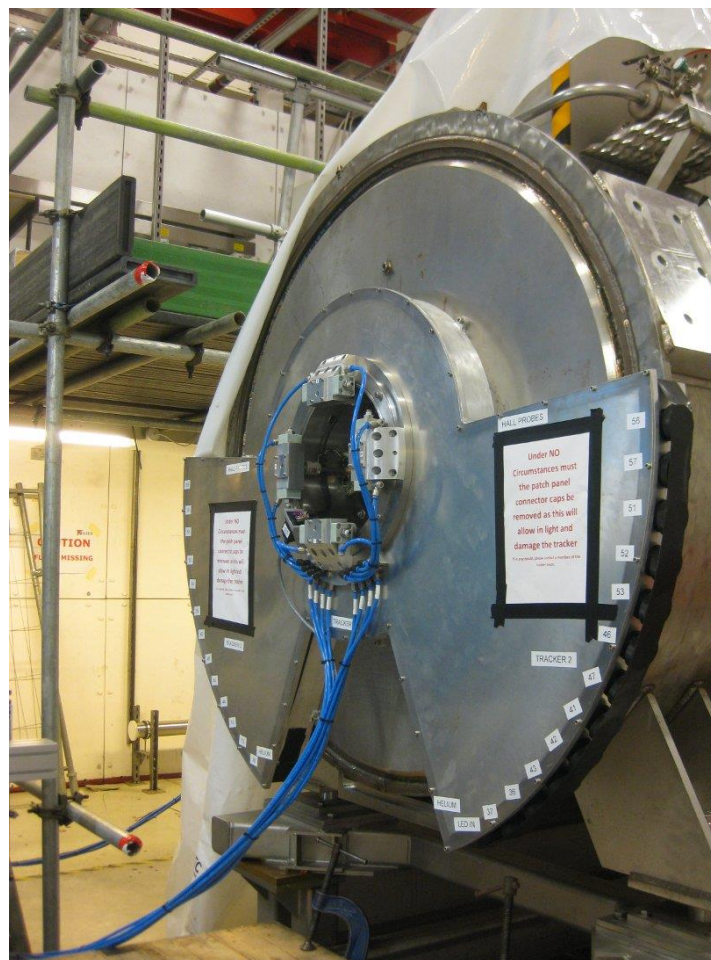
- Significant progress since April 2014:
 - Fully automated proton absorber installed
 - Diffuser installed
 - West wall and south wall mezzanines ready for PRY
 - Rack room 2 being filled with racks and UPS
 - Repairs to Decay Solenoid and installation power supply
 - Both spectrometer solenoids delivered, trackers installed and both spectrometers installed in MICE Hall
 - Second hydrogen vessel delivered
 - Partial Return Yoke is being produced in USA, steel plates being delivered from Japan
 - Focus Coil 2 has been repaired and achieved 225 A – decision made to change FC2 for FC1 for Step IV running
 - New rack for EMR delivered – to be populated October

Beam Line

□ Beam line elements:



Proton absorber



Diffuser

MICE Hall



□ Mechanical Integration

West Wall Mezzanine

South Mezzanine for PRY



Raised Walkway Sections

Quick Release Removable Section for Absorber Change



Removed Walkway Sections

Rack Room 2



- Electrical integration
 - Rack room 2



Step IV control racks



UPS

Decay Solenoid

□ Electrical Integration

- Decay Solenoid: Fixed DS leads, installed new power supply and quench protection system



DS Quench Protection



DS Power Supply

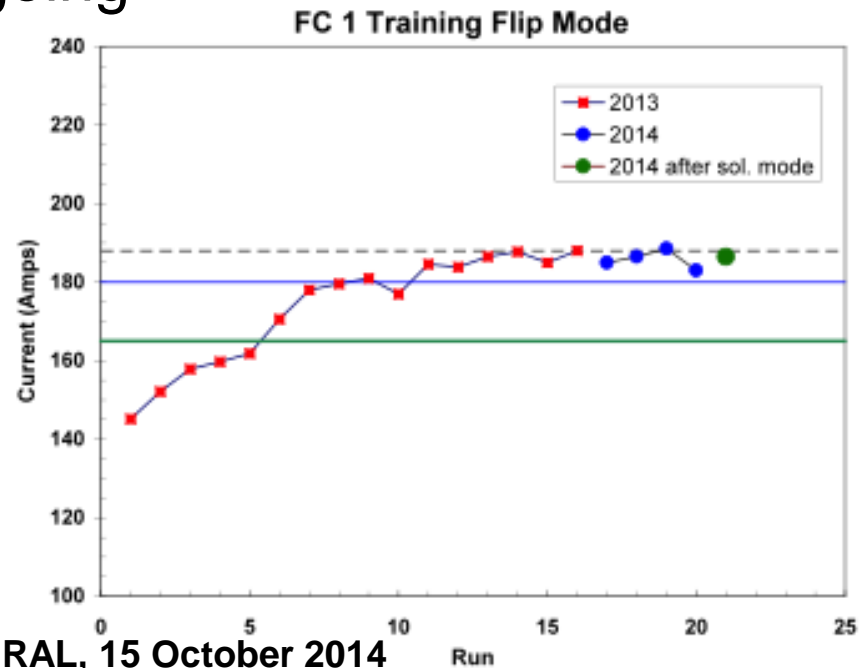


Focus Coils



□ Focus Coils

- FC1 underwent 21 training runs: max current 188 A flip mode
- FC2 repaired and delivered to RAL:
 - First attempt at flip mode: 203 A before quenching, then operated 24 hours at 188 A, quenched at 224.98 A and last quench was at 195 A
- Decision to exchange FC2 for FC1 for Step IV
- Field mapping of FC2 ongoing



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Run

Liquid hydrogen

- Liquid hydrogen delivery system
 - Second hydrogen vessel arrived from Japan
 - ISIS review of hydrogen system to be carried out December 2014
 - The absorber/safety windows delivered
 - Schedule:
 - Vacuum re-commissioning by Christmas 2014
 - Helium cryogenic tests January
 - Safety sign-off during the PRY installation
 - Hydrogen commissioning after PRY complete.

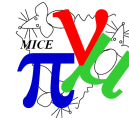


□ RF Amplifiers and Power Delivery

- RF system 1 returned to Daresbury (output stage remains installed at RAL)
- Plan is to deliver two automated amplifier systems for the final MICE Step
- RF distribution network will be required
- New design demands 2 MW to each cavity
- First MICE cavity operated at FNAL with 1 MW and 8 MV/m
- Preparations for muon RF phase determination ongoing using subsample digital signal processing technique



Vacuum system

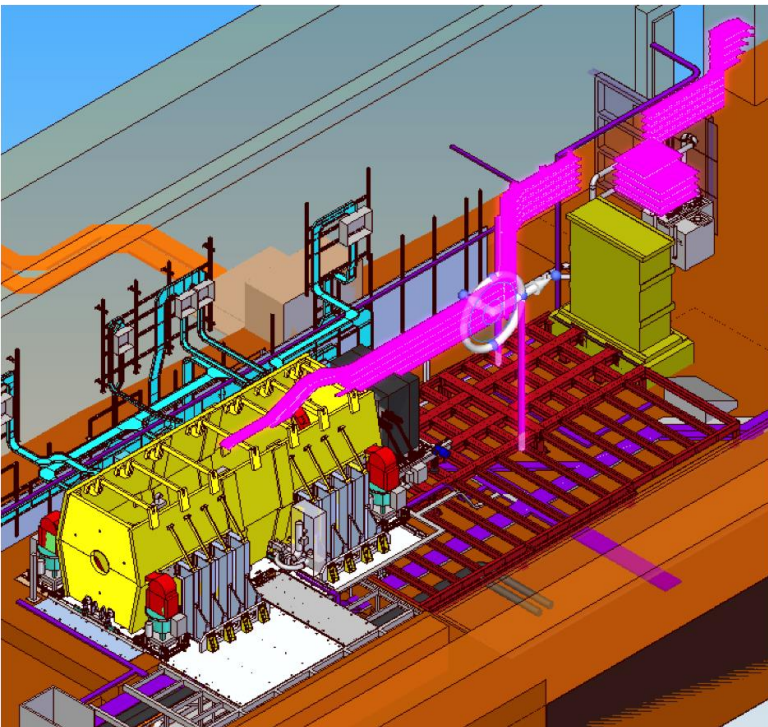


- Design of the vacuum system for Step IV is complete and is being installed in MICE Hall.
- Pumps will be sited outside of the PRY



Partial Return Yoke

- Partial return yoke:
 - PRY design ready, routing of compressor hoses defined and base plates ready for PRY
 - Expected to be fully installed by May 2015



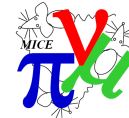
Floor plates (underneath)
and bridge plates



Underfloor columns,
brackets & ties

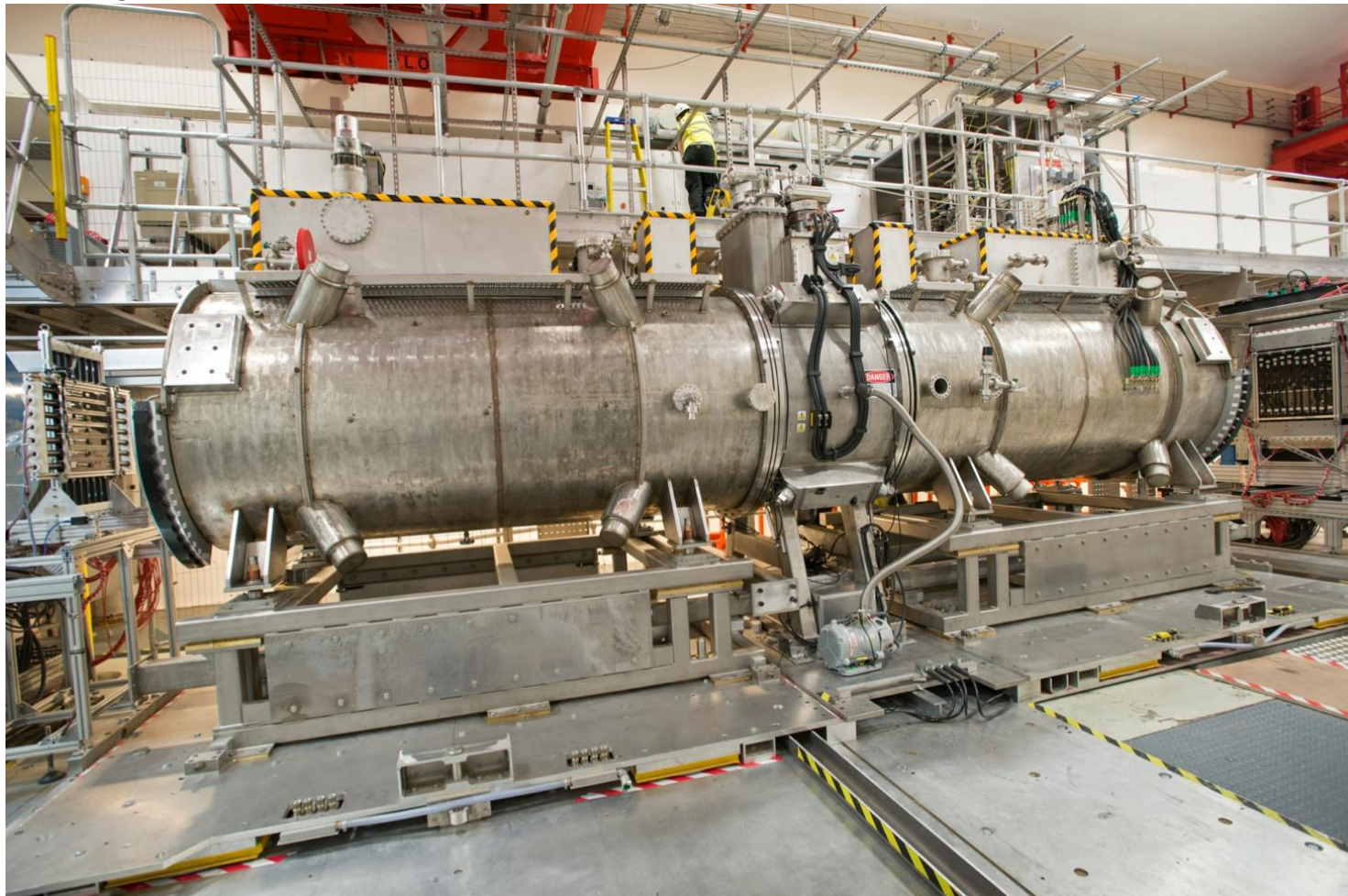
Compressor hose routing to PRY

Spectrometer Solenoids



□ Spectrometer solenoids status:

- Two spectrometer solenoids and FC1 installed in MICE Hall



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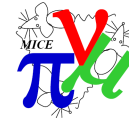
□ Online Computing

- Online coordinator is now Paul Smith (Sheffield)
- MICE Local Control Room layout improved
- FPGA-based trigger system installed and tested
- Replacement network switches purchased

□ MAUS Offline Software:

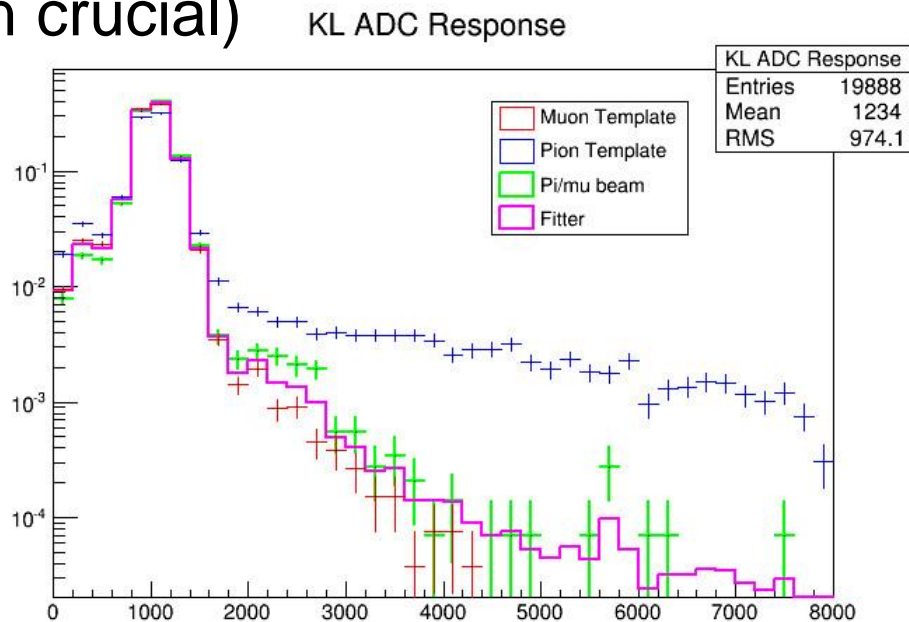
- Developed global PID routines for one and two variable least-likelihood fits (TOF and tracker)
- Tracker algorithms being tuned against MC, resulting in improved reconstruction
- EMR routines tuned against real data
- KL digitisation tuned against real data
- Cherenkov (Ckov) geometry and MC improved

Operations and Analysis



Operations and analysis

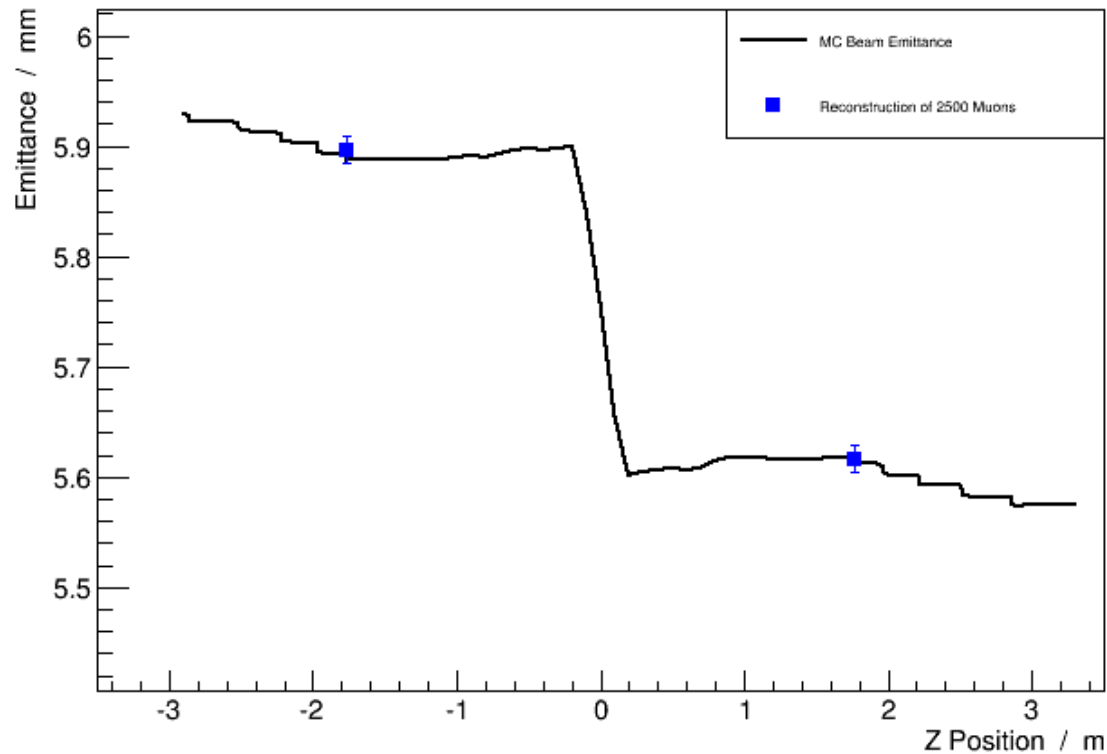
- EMR data analysis ongoing: R. Asfandiyarov PhD thesis accepted and publication in preparation
- Thesis by T Carlisle on prospects for multiple scattering measurements in Step IV
- Pion contamination paper using KL also in preparation (digitisation crucial)



Step IV readiness



- Step IV construction by 27 May 2015
 - Commissioning ends 5 August 2015
 - Expected Step IV data taking: ~10 months



Conclusions



- MICE is proceeding towards Step IV
- Many achievements in last six months:
 - Beamline: Decay Solenoid fixed, proton absorber and diffuser installed
 - PRY preparation in UK on schedule: delay in delivery from USA expected – full installation May 2015
 - Both spectrometer solenoids installed in MICE Hall
 - Focus Coil 2 repaired and achieved 225 A – change FC2 for FC1 for Step IV running
- New Step V configuration agreed after DoE review:
 - Can deliver Demonstration of Muon Ionization Cooling with Acceleration (DMICA) without RFCC module
 - Installation and demonstration of ionization cooling by September 2017: to be described in next talk