

Report from MICE Project Board Meeting 5

10 May 2013, RAL

Overview

Recommendations

- Superconducting magnets
- RF Systems
- Commissioning, Controls & Operations

Preamble

Present for the MPB:

Stuart Henderson,
Charlotte Jamieson (ex officio),
Steve Peggs (chair),
Ron Prwivo (ex officio),
Ian Robson,
Roger Ruber,
Bruce Strauss (ex officio),
Thomas Taylor,
John Thomason (ex officio).

The presentations were of consistently **high quality**, and the discussions that ensued were **stimulating, direct & useful**. We thank the collaboration members who contributed to the meeting for all their hard work, careful thought, & hospitality.

Schedule evolution

Step #	Scheduled run date						
	2003	2009	2010 Sept. MPB1	2011 June MPB2	2012 Mar. MPB3	2012 Oct. MPB4	2013 May MPB5
I	04	Running	→ 10				
II	05	10	11				
III	06	10 → 11	11				
IV	06	11	≥ 11	12	Q1 13	Q2 14	Q1 15
V	06	12-13	12-13	14	-	-	Q3 17
VI	07	≥ 13	≥ 13	15	16	18	19

MICE schedule evolution, from the project proposal until the present.
Step IV has slipped beyond the ISIS long shutdown (Aug 14 - Feb15).
 Step V has therefore re-emerged.
Nonetheless, progress is solid.

OVERVIEW

The MICE project team is **congratulated on achieving significant progress** since the last MPB meeting in October 2012.

In particular, the **retirement of some significant risks** is a good step forward.

On the U.S.-side the **successful** acceptance of the first spectrometer solenoid (**SS2**) magnet in both “flip” and “solenoid” modes of operation is a significant milestone.

In the UK, the **success** of a **focus coil** in achieving its specification in **solenoid mode** represents a good step forward, although it is somewhat tainted by the current behaviour of the training in flip mode.

Indeed, the **training** nature of all the magnets is **not a well understood** phenomenon, and this needs further investigation for the long-term operability of the experiment.

OVERVIEW - magnets

The cold-mass parts of the Radio Frequency **Coupling Coils** (RFCC's) are now in manufacture at LBNL and the cavities are being electro-polished.

The cold mass **leak** in the first CC has been **repaired** and it is currently **cooling down** at FNAL for its test programme.

OVERVIEW - stray fields

A major effort has been expended in understanding the issue of the **stray magnetic fields** in the MICE Hall and beyond.

The **confirmation of the simulation predictions** by tests with the focus coil (FC) in R9 shows good promise.

The **“baseline”** solution is to move equipment in the Hall and to providing local shielding.

The **alternative** “partial return yoke” solution, of which one outline design has been produced in the US, is making good progress.

A **decision** on which path to choose for **Step IV** is planned for the end of September.

It is noted that the movement of the compressors to the West Wall is now the critical path item for Step IV.

OVERVIEW - infrastructure & staff

Good **progress** has been made on the **installations** of infrastructure in the MICE Hall itself.

Tests of the first amplifier for the RF infrastructure are **well underway** at Daresbury Laboratory and the design for the **TIARA** (Test Infrastructure and Accelerator Research Area) demonstrator is on schedule for **installation later this year**.

To support this general area a full-time **RF engineer** has been appointed.

The delivery of the **EMR detector** from Geneva is now close, with construction complete and **testing** underway.

Good **progress** has been made on the planning for the **training** of people to support operational running.

Plans are in place for the **support required to staff-up** the major operational phase of Step IV.

RECOMMENDATIONS

OVERVIEW

Recommendation 1. Create a living, accessible and regularly updated one-page "[dashboard](#)" summary of milestone achievements demonstrating the evolving status of deliverables (eg magnets), initially focusing on Step IV, as soon as possible.

Recommendation 2. Produce a one-page specification for the operation of the [MICE International Project Office](#) and present at the next MPB meeting.

RECOMMENDATIONS - 2

SUPERCONDUCTING MAGNETS

Recommendation 3. Investigate the potential reasons for the **slow and unusual training** of Spectrometer Solenoid 2 (and Focusing Coil 1). Check the protocols (eg travelers) for the Spectrometer Solenoids and Focusing Coils, to establish the level of quality assurance and to seek explanations for slow training. Present results at the next MPB meeting.

Recommendation 4. Re-evaluate the possibility of **proximity shielding** (partial yoke) that takes into account the detailed situation of the present infrastructure in the MICE hall and present a plan for future work at the mitigation shielding review at RAL in August/September.

RECOMMENDATIONS - 3

RF SYSTEMS

Recommendation 5. Prepare a plan to [test a prototype Low Level RF system](#) with the RF Coupling Coil at the Fermilab MTA, and present the plan at the next MPB meeting.

RECOMMENDATIONS - 4

COMMISSIONING, CONTROLS & OPERATIONS

Recommendation 6. Present an **integrated** plan for all aspects of the **control system** at the next MPB meeting.

Recommendation 7. Present the requirements and design of the MICE **timing system** at the next MPB meeting, with particular emphasis on absolute calibration by particle arrival phase measurement.

Recommendation 8. Explore the potential to achieve **synergistic** economies of scale in the maintenance and operation of the **liquid hydrogen** system by working with the ISIS moderator cryogenics team, and present at the next MPB meeting.

Recommendation 9. Develop an **on-site support plan** for day-to-day operations, maintenance and repair of the MICE hardware, and present at the next MPB meeting.