

## **Response to feedback from the Resource Loaded Schedule Review panel and the MICE Project Board**

This document provides a response to the points raised in the feedback from the Resource Loaded Schedule Review committee and the MICE Project Board following their meetings in November 2013.

### **Resource Loaded Schedule Review**

- 1. Complete the first action from the previous meeting. While the Panel appreciates the work to date it feels there is a need for more coherence between the two sides, especially the embedding of risk-contingency into schedule.**

The international project team accepts the Panel's recommendation and is taking steps to address this recommendation.

- 2. Produce a coherent single project plan that takes into account anticipated delays due to risk (and the R&D risks) by the next meeting.**

The project team has initiated the analysis necessary to address the Panel's recommendation.

- 3. Produce a single, coherent financial report for the project taking into account the schedule above by the next meeting.**

While the reporting structures differ on the UK and US sides, efforts are being made to harmonise the reporting paradigm. Progress will be presented at the next meeting.

- 4. Ensure that all work packages are adequately integrated into the overall cost and schedule.**

With the exception of the implementation of the Step VI yokes in the MICE Hall, the UK and US project plans already contain estimates of the cost and schedule of all aspects of the project to Step VI. The project team recognises that the magnetic mitigation plan needs to be brought into the otherwise coherent whole. Progress will be made on this aspect of the project planning and presented to the Panel at its next meeting.

- 5. Encourage, through the Project Engineer, the project to develop more rigorous integration protocols across the project, such as acceptance criteria, to minimise schedule delays.**

Through the MIPO, the Project Engineer will be supported in taking the actions necessary to develop the rigorous protocols required to ensure the timely integration of the experiment.

- 6. Ensure a first cut estimate of the Step V and VI partial return yoke concept is folded into the UK funding requirements.**

As noted under item 4, the international project team recognises the need to make initial cost and schedule estimates for the implementation of the partial return yokes for Step VI.

- 7. Following the good work done on establishing the criteria for the successful conclusion of Step IV, the project now needs to focus on looking at how to decide for Step V versus Step VI as it no longer looks like going to V and then VI sequentially is the most optimum option (this is not critical at this point but that decision point and the science trade-offs needs to be continually borne in mind by the project and the funding agencies).**

Steps are in hand to initiate a detailed and robust debate of the relevant issues within the collaboration. While it will not be possible (nor necessary) to come to a final conclusion at the time of the next round of reviews, the status of the collaboration's analysis will be presented.

## MICE Project Board

1. **Document a set of modes for the magnets at each acceptance test and each Step (IV, V and VI) as installed such that a consistent set of conditions is used across all simulations, and present at next meeting.**

The project team notes the Board's request and will develop such a document in time for the next round of reviews.

2. **Clearly document the nominal operating point (or maximum operating point), and the design point for each coil, such that the magnet performance during a test is clearly compared to the target value. . . . Present documentation at next meeting.**

The international project team notes the Board's request and will develop such a document in time for the next round of reviews.

3. **Document the acceptance criteria and establish the acceptance test plans for each coil, independent of whether the interface is a vendor or a collaborator, before testing begins. At minimum this will assist with the required tests completed before shipment.**

The international project team notes the Board's request and will develop such acceptance and test plans and document them in time for the next round of reviews.

4. **Present quench training results of the Focus Coil 2, CC1 cold mass and SS1 to the Board as soon as the data become available.**

Focus-coil module #2 arrived at RAL at the end of October 2013. The cool-down of module #2 has not been satisfactory. It has not been possible to reduce the temperature of the radiation shield below  $\approx 120$  K and the cold mass has not cooled below  $\approx 9$  K. In the week of the 9<sup>th</sup> December 2013 a cold spot on the inner bore was identified indicating a thermal short between the radiation shield and the vacuum vessel. In discussion with TESLA it has been agreed that module #2 will be returned to the factory for diagnosis and repair.

It has been agreed that TESLA will make the required modifications to module #1 (fitting of insulation around the first stage of the cryocooler and correcting the tension of the support straps). The coils have been rearranged in R9 to allow this work to start in the week of the 16<sup>th</sup> December 2013. Re-training of focus-coil module #1 will begin in the New Year to ascertain whether acceptable performance in flip mode can be achieved.

Preparations to cool and power spectrometer solenoid #1 continue. An appropriate summary will be prepared and sent to the Board when new training data become available.

5. **Explore magnetic shielding solutions for Steps V and VI, together with implications for the general layout of the hall, and present findings at the next meeting.**

While the priority will remain the completion detailed design for the partial return yoke at Step IV, preliminary studies will be carried out to inform the cost and schedule estimation requested by the Resource Loaded Schedule Review panel.

6. **Develop plans for an integrated RF system test at RAL—including RF power amplifier, prototype LLRF and a MICE cavity—and present at the next meeting.**

The international project team notes the Board's request and will take the necessary steps. Progress will be reported at the Board's next meeting.

7. **Develop a plan to select the method for muon transit RF phase determination perhaps using such an integrated RF system test and present at the next meeting.**

The international project team notes the Board's request and will take the necessary steps. Progress will be reported at the Board's next meeting.

8. **Present a status report on the MICE simulation, online and offline analysis capabilities and show results of the end-to-end Monte Carlo simulations, including tracking and reconstruction, in support of the Step IV, V and VI physics goals at the next meeting.**

The international project team notes the Board's request and will take the necessary steps. Progress will be reported at the Board's next meeting.

9. **Fully define the responsibilities and personnel for MICE operations and maintenance support, taking into account shared responsibilities with ISIS where appropriate and efficient, at the next meeting.**

The collaboration has completed its review of the arrangements under which the construction project is managed by the "MICE International Project Office" (MIPO) and the operations and analysis activities are managed by the "MICE Experiment Management Office". Details of the new management structures may be found in reference [1].

## **References**

- [1] The MICE Executive Board, "Management of the MICE construction, maintenance, operations and analysis activities." <http://micewww.pp.rl.ac.uk/attachments/download/1822> , 2013.