Response to Oversight Committee feedback

Science and Technology Facilities Council MICE OsC Act 2(13)

1. **The Collaboration's report ... that in future, the different sub-sections needed to be better connected together. In addition, the financial information needs to be more detailed. The Office will provide template tables for future use.**

   The project team note the Committee's recommendation and will take appropriate action. The templates that have been provided by the Office will be used in future reports.

2. **The Committee noted the proposal to establish a MICE Experiment Management Office, agree that it is important that the UK collaboration recruit somebody to decide how experiments should be run and examine the decision making process. The Committee would like to see a more detailed proposal, with clearly identified roles and responsibilities, at its 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].

3. **The Committee would like to see an updated risk table, and requests that the Collaboration reconsiders its risk mitigation strategies.**

   The project team has reviewed the project risk table as part of its preparation for the November 2013 Resource Loaded Schedule Review. The cost of risk mitigation is now being evaluated in a "bottom-up" manner in order to respond to the Project Sponsor's request that the project team provide a revised forward look in which working margin and contingency are explicitly called out. The analysis will be presented to the Committee at its next meeting.

4. **The Committee would like to understand the long-term impact on MICE physics resulting from AFC #1 not operating above 187 A. The Committee would like to know by the end of January whether AFC #2 meets specification or operates in the same way as #1. The Collaboration should also clarify the contractual status of design changes in AFC from the original specification (number of turns vs. current) if AFC#2 behaves as AFC#2, and not operating above 187 A compromises MICE physics.**

   The performance of MICE at Step IV and at Step VI has been studied including a focus coil that does not perform to specification [2]. The consequences may be summarised as follows:

   - The minimum β function that can be achieved in flip mode at Step IV is limited, being increased over the minimum that can be achieved with the nominal focus-coil performance. This limitation rules out some of "exotic" low-β function lattices. According to standard approximations, this limitation results in a proportionate increase in equilibrium emittance. However, for all momenta the baseline β function of 420 mm is accessible; and
   - The β function that can be achieved in flip mode at Step VI is also limited. The β function is increased by around 20% at 200 MeV/c, and around 100% at 240 MeV/c. This results in a proportionate increase in equilibrium emittance.

   At present, the baseline Neutrino Factory front-end operates with an equilibrium emittance of around 6 mm (a β function of 800 mm) and a central momentum of around 230 MeV/c; so, the 240 MeV/c momentum case in MICE is of interest to the muon accelerator community. Even with the reduced currents discussed in [2], MICE can produce a satisfactory physics result at a momentum of 240 MeV/c.

At the MICE central momentum of 200 MeV/c, the cooling potential of the lattice would be relatively unchanged.

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 $\approx 120\,\mathrm{K}$ and the cold mass has not cooled below $\approx 9\,\mathrm{K}$. In the week of the 9^{th} 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^{th} 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.

5. **Financial reporting needs to be tightened up. The Collaboration will discuss with the Office how this can be achieved.**

   A meeting to discuss revised reporting arrangements between R. Preece, A. Grant and C. Jamieson reached an agreement on revised reporting arrangements. The agreed procedures are now being implemented.

6. **The Hall Manager post is critical to the success of the MICE installation, and the Committee believes that it is essential that the right person is recruited, even if this means re-advertising the post.**

   The project team agree with the Committee and will take every precaution to ensure that an appropriate candidate is recruited into the post, even if this requires re-advertisement. An offer was made to the top-ranked candidate. However, it was not possible to negotiate a satisfactory agreement and the candidate has withdrawn. The second candidate has been approached and informally accepted the position. The detailed negotiation is now in the Hands of the Human Resources Department at RAL and a formal offer, with a start date of 3^{rd} February 2014 is expected to be made before Christmas.

7. **The Committee would like to understand how the UK Collaboration intends to control the overall system engineering aspects of MICE as a coherent project.**

   The role of Project Engineer has been defined as part of the MIPO [1]. A. Nichols has taken the role of Project Engineer and has responsibility for the overall system engineering.

8. **At some future point, the Committee would like to revisit the physics case for Step V vs. Step VI.**

   The collaboration will take steps to renew its investigation of the science gain from Step VI over Step V. A first plenary discussion will be organised at the next MICE collaboration meeting which will take place in February 2014.

9. **At the next meeting, the Committee would like to see details of the Collaboration's plans for on-line/offline software.**

   The project team notes the Committees request and will provide the relevant information.

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.

[2] C. Rogers *et al.*, "Effect of reduced focus coil current on MICE steps IV and VI." MICE Note 434, 2013.