MICE MPB/RLSR
Integration of Step IV

- *Readiness of the major subsystems*
- *Installation sequence and schedule considerations*
- *Logistics, staffing and local planning*

Andy Nichols, STFC, 29/4/13

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Readiness of major subsystems

- *Spectrometer solenoids*
  - *SS2 (upstream) has been moved to MICE hall, tracker already fitted*
    - *It is fitted to the base frame but not fully bolted down*
    - *Some work to be done on leads by US team, can be done at any time, probably October*
  - *SS1 (downstream) arrived in early May*
    - *Is in R9 being prepared for tracker*
    - *Need to wait until moving around of FC1 & FC2 is complete before fitting tracker*
  - *SS power cabling*
    - *Routing layout and procurement are well in hand by DL Group*
    - *Open issue with cables from turret being cleared by the MIPO*

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Readiness of major subsystems

- *AFC1*
  - *Performance limitations have been outlined elsewhere*
  - *At the moment it is the default magnet for Step IV*
  - *Field mapping planned to start Early June, mapping gear is here*
  - *Movement to the MICE Hall not a problem, ie, we can do it ourselves*
  - *It will be placed on its platform offline and the vessel welded to the baseframe*
    - *But AFC2 might be in the frame…….*
    - *Repairs at Tesla are nearing completion*
    - *If its performance is superior to that of FC1, and it can be swapped without affecting the schedule, it will be*
    - *But this decision should be taken before the absorber and hydrogen system are integrated*
- *Diffuser*
  - *Stored at Oxford, ready for delivery and use*
    - *Minor issue with air piping to clear up – Mike Dawson will visit after holiday*

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Readiness of major subsystems

- *Liquid hydrogen system*
  - *Hardware*
    - *Transfer line complete*
    - *Roof and Hall installation complete*
    - *High volume N2 gas supply required – bottle packs worked but inconvenient*
    - *Plan to buy nitrogen generator and install near doorway, some minor additional pipework, but need to check on purity level*
  - *Admin & safety*
    - *Liquid hydrogen working group will be re-convened in May/June (ISIS-MICE-PPD) membership*
    - *HAZOP for Step IV successfully concluded by third party consultants in October 2012 – this covered the full experimental configuration for Step IV as opposed to the system test*
    - *The hydrogen team will need to be rebuilt – critical skill shortage is control engineering*

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Readiness of major subsystems

- *Absorber and windows*
  - *Absorber fitting trial was a success*
  - *All the tooling worked OK*
  - *Unique indium seal design proved to work in test vessel – pressure and temperature cycled OK*
  - *We need four of the thin windows from the US – understand they're ready*
  - *Lithium Hydride absorber still beset by Admin – but we don't need it till later*
- *Vacuum system*
  - *Now a discrete work package under the leadership of Mark Tucker*
  - *A fully manifolded system for Step IV*
  - *Most parts ordered*
  - *Conventional installation*

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Readiness of major subsystems

- *Muon Beamline*
  - *Maintenance only, decay solenoid now cold and QD & PSU tests progressing well*
  - *Remotely operated proton absorber installed*
- *Detectors*
  - *EMR rack needs to be re-packaged (RAL safety requirement)*
  - *TOF2 repositioned due to PRY – new bracketry required*
- *PRY*
  - *Manufacturing drawings complete*
  - *Procurement has started*
  - *It's the most important thing this year – we'll adapt to its delivery!*

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Readiness of major subsystems

- *Rack Room Two*
  - *Cable trunking complete*
  - *Building alterations complete*
  - *Raised floor work about to start*
  - *Rack-family due to arrive from DL in early June*
  - *Installation begins then – this is the major electrical push*

- *West mezzanine*
  - *Structurally complete, subject to load test this Friday*
  - *Then compressor stands can be located and cabling started*
  - *Two compressor stands made for evaluation*
  - *Have material for the other thirty*

- *PPS*
  - *Maintenance only, some minor changes required due to proximity of West mezzanine*

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Sequence and schedule considerations

- *It's very clear:*
  - *MICE's top-level milestones and schedule have been defined for some time and need not be repeated here*
  - *The four principal, unavoidable in-series operations are:*
    1. *The critical hardware item is the South side PRY support, which must be installed first*
    2. *Then the three magnets can be installed*
    3. *Then the North side PRY*
    4. *Then the final LH2 connections*

    - *All other significant work may be done in parallel to some extent*

  – *Our job is to provide a flexible way of working, with sufficient resources to meet the overall milestones…….*

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Logistics, staffing and local planning

- *Working patterns*
  - *Because of space and safety constraints, generally three areas in the MICE Hall can be worked on in parallel:*
    1. *The beamline area*
    2. *Rack Room Two*
    3. *South & West mezzanines (LH2 and CCR compressors)*
  - *Assuming that each area minimally needs two people, we need six in total for the core installation team; we have three now*
    - *Two more staff have been interviewed and selected, one mechanical and one electrical, with experience on Diamond*
    - *We also have the full-time Hall Manager, who is rather 'hands on'*
    - *And of course the contributions of external project staff*
    - *Normal working week applies, with overtime at 20 hour/month within STFC guidelines*
    - *DL electrical supervisory staff have agreed on alternate presence at RAL, ensuring near 100% coverage*
  - *Detail planning is by Wednesday meetings – with more in-depth monthly infrastructure meetings*

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Logistics, staffing and local planning

- Storage and handling
  - Continues to be a problem, but we have:
    - R9 and a possible extension of it
    - An open area at the top of RAL site, which we will use to store PRY components
    - Short-period use of building R24
  - Quite important to remember the we cannot rely at all on the RAL rigging crew during August 2014 to Feb 2015, as they will be fully occupied during the ISIS moderator change
    - We will need to be self-contained
    - Will rent a three tonne forklift and have trained two drivers
    - And we have four qualified crane drivers

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