FETS Meeting: 17th September 2014

RAL, CR13, R68

Present: A. Letchford, P. Savage, M. Dudman, S. Lawrie, M. Aslaninejad, J. Back S. Gibson, A. Kurup, M. Clarke-Gayther, S. Lawrie, A. Bosco, T. Davenne.

Apologies: D. Faircloth P. Posocco, G. Boorman, S. Jolly, J. Taylor, R. Edgecock, S. Alsari, K. Kruchinin, J. Pozimski, C. Plostinar,

Circulation: FETS Webpage

Next meeting date: 15th October 2014 – RHUL

Administration

1. Finances are currently within budget and within estimated spending at current period.
2. Preparation for proposal is currently with J. Pozimski who is on leave. He will update the group at the next meeting.

Scheduling (S. Gibson)

1. FETS grant expires in March 2014 hence the application for the extension.
2. S. Gibson will provide a monthly update with visual overview.
3. The schedule will identify resource constraints / bottlenecks. It will highlight the timeline for key decisions and the impact they have on the schedule. The aim is to have the beam line complete by 2016, considerations also include the future of FETS.
4. The schedule is broken down into two parts, R8 installation and commissioning and a development schedule.
5. A readiness log will be compiled for components awaiting assembly.

Ion Source and LEBT (S. Lawrie)

1. S. Lawrie is trying to run VESPA with regards to getting results to present at the next conference.
2. The gap between the LEBT and the RFQ section one needs to be verified.

RFQ (P. Savage)

1. RFQ section one is returning to NAB with section two coming to RAL on the return leg.
2. P. Savage to arrange a meeting with D. Wilsher to determine the inspection routine.
3. If section two is dimensionally correct, NAB will be asked to complete section three and four. NAB has used their CMM machine to complete some inspection. Their results will be compared with RAL's inspection.
4. A question was raised if it was thought NAB had understood the errors generated in section one and therefore they would not be repeated. Each section requires thousands of operations so errors are possible. However NAB had found out why

they occurred, repeated them on a test piece to understand and put in place a solution to ensure they are not repeated on further sections.
5. Section two will be assembled, inspected at RAL and sent to NAB for final machining. Turn around for re-machining is estimated at one week. The longest wait for a machine to become available at NAB to date is three weeks.
6. An offset bead pull test should be developed. The most useful test will be on all four sections in all four quadrants. Bead pulling a single RFQ section will not generate any meaningful information but may give a better understanding of the set up and process.

RF (S. Alsari, M. Dudman)

1. M. Dudman gave a presentation update of the frame that will be developed to hold the coaxial waveguide on the shielding roof.
2. A. Letchford will push through the order for the E-mitre bend that is required for the full power tests.
3. Flow meter heads are required in order to interlock / monitor the water flow. M. Dudman was asked to order the parts required.

MEBT

Engineering (P. Savage)

1. The vacuum manifold and MEBT frames are in detailing with D. Zakhar.
2. The cavity design is complete and a test piece is being made for a copper plating test. It test proves successful the drawings will go out for quote. A. Letchford enquired about delivery timescales. P. Savage said he would ask C. Evans for an updated scheduled.
3. P. Savage is looking at the scraper design which needs work to improve cooling.
4. C. Evans may be asked to work on the chopper beam dumps. An initial meeting has occurred and a second is required with C. Densham to ask for his input.
5. A support frame will need to be designed for the main FETS dump.
6. A. Letchford introduced T. Davenne to the group. He had been asked by C. Densham to attend the meeting to see what his group can offer.

Chopper

1. M. C. Gayther has met with G. Boorman and S. Gibson to discuss the electronic requirements of the chopper. They are concentrating on knowledge transfer and division of effort prior to M. C. Gather's retirement.
2. Electrical losses in cables should be kept to a minimum by managing cable lengths to the nearest centimetre. This is due to the fact that timing is reduced by 5 ns per metre length. It may be possible to site some electrical cabinets inside the shielding although this may require air cooling and may produce issues with stray RF.

MQP

1. The first complete magnet is due end October 2014. RAL is to verify results of magnet tests.

2. Second order of quads will go to Danfysik without tender. Scheduled for completion end of June / July 2015.

Beam Diagnostics

Laser Diagnostic CERN (S. Gibson)

1. Latest tests at 3 MeV, diamond signal follows beam current. This was the last test before Linac 4 was shut off. Due to be turned on next week, RHUL planning to visit when beam operating.
2. Good comparison on contour plots from a slit grid and laser diamond scans at 3 MeV.
3. S. Gibson enquired what the spec and speed of the camera should be. It is not known if a scintillator exists that can be used at high power. The camera cannot be shipped abroad therefore it may require a reposition of the diagnostics equipment.

Laser Diagnostic Simulation (A. Kurup)

1. Initial goal was to replicate diagnostic results with beam to dump, beam to diagnostics and through dipole to dump.
2. Using lattice 4 from J. Pozimski produced same results as lattice 2.
3. With dipole off but quad on at 6mm offset, beam becomes more circular which indicates beam 'blowing up' before reaching dump.
4. Dipole on and screen at laser position there's a slight shift which maybe indicates the fringe field is seen. It may be that the offset is due to the beam being bent in relation to the original coordinates.
5. Screen position is now 4.4m, just after the second dump, with elliptical cavities.
6. There have been a few issues with running software and M. Aslaninejad is helping with this.
7. Discussions with J. Pozimski and M. Aslaninejad will evaluate results and future aims through regular meetings.
8. Questions raised include:
   - Should laser diagnostic lattice be repositioned.
   - How much space is available down stream.

   Future plans include:
   - Fixing issues using final MEBT lattice.
   - Effects of dipole fringe field.
   - Look at altering quad settings.
   - Beam dump studies.
   - Laser.
     - Realistic simulation of stripping.
     - Laser dump.
     - Beam scanning in x requires mirror in the vessel.
     - Investigate detector options and how to do the reconstruction.
     - If position is outside dipole, existing dipole magnet may be utilised.

BPM

1. The five off RAL design BPM's will be tested at RHUL. Each one should be stamped with an identifiable number to match up with test results.

Shielding / Infrastructure / RF (M. Dudman, A. Letchford, S. Alsari)

1. The build date is scheduled for the first week of October having been rescheduled due to lack of effort.
2. R8 has been cleared to enable to erection of a mobile crane.
3. The build will be done in phases with the north wall being built first. T. Pike and M. Dudman will co-ordinate the build.
4. The channels, originally going to be cut in the floor for the cables, have proved not to be an adequate design. Another solution will need to be found, most likely through the roof block. Making this decision allows the build to progress as modifications can be made to roof blocks not manufactured yet..
5. The ESS dummy load move will need to be completed with manufactured legs assembled. This will complete the waveguide run prior to full power RF tests.

AOB - None

Actions:

1. P. Savage to arrange a meeting with D. Wilsher to determine inspection. requirements and compare results with NAB's.
2. A. Letchford to push through MEGA order.
3. RHUL to look at developing bead pull test.
4. M. Dudman to purchase flow meter heads and complete set up for full power RF test.
5. P. Savage to look at scraper design and water cooling.
6. S. Gibson and G. Boorman to work on knowledge transfer of the chopper design with M. C. Gayther.
7. M. Dudman to arrange and coordinate with T. Pike phase one of the Shielding build.
8. M. Dudman to find another solution for the cable entries into the block house.
9. S. Gibson / G. Boorman to arrange testing of BPM's.
10. M. Dudman / P. Savage to arrange relocation and assembly of ESS dummy load manufactured legs.