FETS Meeting:

RAL, R3, CR11 – 19th February 2014

Present: J. Pozimski, A. Letchford, S. Jago, P. Savage, M. Dudman, S. Lawrie, S. Gibson, D. Faircloth, M. Clarke-Gayther, S. Alsari, C. Gabor, M. Aslaninejad, P. Posocco, C. Plostinar, K. Kruchinin, A. Bosco,

Apologies: G. Boorman, S. Jolly, J. Back, A. Kurup,

Circulation: All

Next meeting date: 19th March 2014 – RAL

Administration

1. All travel claims should be sent to Adele Cook.
2. When asked there was no specific requirements for spending this financial year. However it was decided that an amount of cabling could be specified and ordered.
3. M. Dudman is putting together a Gantt chart for the FETS requirements.
4. The laser is required to be returned by the end of March under the agreement with CERN. It may be revised for another six months with A. Letchford arranging this if required.
5. A laser documentation meeting is to be arranged to progress the laser room installation.

RFQ (P. Savage)

1. The RFQ has been inspected and has revealed that the vane tip modulations have the correct form but not the right place. A linear error of 1.4mm and a height error of 0.18mm were noted.
2. The error was caused by the machining head being tilted to aid the finish of the cut, but no compensation code was added to account for this. These known errors are replicated in the inspection report.
3. NAB will do test with machine tilted and in vertical position to confirm error.
4. A. Letchford gave a presentation on the change in beam dynamics due to this known error. There is a 10% change in field strength with 3% loss of beam. The issue would be the increase in vane separation causing a deviation of plus or minus 6.1 MHz which is well outsize the tuneable range, raising issues with the RF.
5. P. Savage showed the error pictorially to the group and suggested possible solutions including, skimming 2mm of minor vane height and re-machining the whole vane profiles with coolant, to give a better surface finish.
6. It was suggested to set up the RFQ symmetrically for a frequency test and compare to simulated results.
7. M. C. Gayther enquired if there was a defined cleaning process for the RFQ if coolant is used, as it would out gas with a rise in temperature during operation. In this case alcohol would be used.
8. A. Letchford indicated that he would be present in the next week but would be in Japan the following week.

Beam Diagnostics

Toroid's (S. Lawrie)

1. Amplifiers have been manufactured in R12. The windings will hopefully be done by a summer student.

BPM (S. Jolly)

1. Test rig designed but requires modifications. S. Jolly asked if he could get external engineering effort and was told to get a quote.
2. The CERN strip line will require a KF40 flange to join to the beam line. A machined notch in the flange acts as a rotational alignment. Details of this notch will be forwarded by P. Savage to S. jolly, the tolerances are achievable.
3. S. Lawrie will put a CAD model of the button BPM design he is working on, on the FETS webpage.
4. The quotes obtained by M. Dudman for the CERN BPM test rig components will not be progressed due to the modifications required.
5. S. Lawrie showed the group the BPM he had manufactured, vac tested and modelled in Microsoft studio.
6. M. Dudman is to progress the button BPM design into team centre via a contractor.
7. S. Gibson gave a presentation on behalf G. Boorman on how the CERN strip line and button BPM's will be tested. It is hoped a summer student based at RHUL will work on the project.

Shielding / Infrastructure / RF (M. Dudman)

1. A. Letchford was asked to arrange the next meeting with P. Wright.
2. M. Dudman to progress the quote for the shielding blocks.
3. A question was raised if air circulation was required inside the blockhouse.
4. The Dummy load on loan from the ESS is on route to RAL. Payment for shipment was covered by the ESS.

RF (S. Alsari)

1. Four RF co-axial parts are on hold with MEGA until final measurements are known.
2. Invoice issues with MEGA need resolving.
3. Tests on the amplifiers will be completed prior to acceptance. Confirmation of who will visit the supplier to confirm test results is required.

MEBT

1. The MEBT lattice has been uploaded to the FETS website.
2. All documents should be updated and uploaded.
3. The Quads are on order, due in October 2014.
4. P. Savage informed the group of the progress of the cavity. The nose design is to be investigated for the possibility of electron beam welding the copper to steel joint. This will reduce plating tolerance issues, the current design has a weld on

outside with a gap on the inside which will affect the Field. The ISIS design has a larger cavity with separate nose and conflat joint with finger strip.
5. An option is to have a two piece design with weld inside then plate as an assembly.
6. The design of the vac vessels needs to be revisited to ensure compatibility and verify MEBT dimensions.
7. A. Kurup is looking into power distribution on the beam dump. C. Densham also looking at the beam dump design. P. Savage to put together a document for him.

Chopper (M. C. Gayther)

1. A meeting is planned in R8 to discuss chopper progress.
2. M. C. Gayther gave a presentation showing both short model and planar chopper designs. He gave a part break down in terms of quantity used in each design.
3. J. Pozimski suggested building one fast and one slow prototype concentrating on the planar design. If problems arise a helical design could be built.
4. M. C. Gayther suggested making a co-axial line to see if it was possible and obtain quotes for parts to estimate costs.

Ion Source and LEBT (C. Gabor)

1. The ION source has now been run and the beam is not aligned / centred correctly. The robust pins have been manufactured but not installed yet.
2. Measuring the beam at different solenoid positions and taking an average was suggested to compare values.
3. Work on the low level phase shifters is required. M. C. Gayther has a contact in CERN, A. Butterworth, who works with either polar or Cartesian systems. S. Alsari is to look into the systems, with a simple feedback loop around the shifter being a possible solution.

Beam Diagnostics

Laser (S. Gibson)

1. S. Gibson gave a presentation showing the progress of the laser tests at CERN.
2. The first signal was on the 22nd January 2014 with the first profile scan on the 11th February 2014 where repeated vertical laser scans with different diamond detector positions were carried out.
3. Current aim is to take five pulses at each position.
4. First results are encouraging compared to emittance scans.
5. During the next test the aim will be to complete:
    - Two dimensional scan in X and Y.
    - Laser power scan.
    - Beam current scam.
    - Evaluate the effect of modifying quad settings.

Actions:

1. A. Letchford to arrange for laser loan extension if required.
2. P. Savage to progress NAB machining error tests.
3. M. Dudman and P. Savage to assemble RFQ for frequency tests.
4. P. Savage to forward details of the KF flange notch.
5. S. Jolly to progress quote for test rig effort.
6. S. Lawrie to put BPM CAD model on FETS webpage.
7. M. Dudman is to progress the button BPM design into team centre.
8. M. Dudman to progress the quote for the shielding blocks.
9. M. Dudman to track shipment of ESS dummy load.
10. S. Alsari and A. Letchford to look into Invoice issues.
11. P. Savage progress welding feasibility of the cavity.
12. A. Kurup to look into power distribution on the beam dump.
13. P. Savage to put together a beam dump document for C. Densham.
14. A meeting should be arranged to discuss the progress of the chopper.