LHC RF Meeting 18th June 2004

Present: Philippe Baudrenghien, Andy Butterworth, Olivier Brunner, Edmond Ciapala, Wolfgang Höfle, Trevor Linnecar, Pierre Maesen, Volker Rödel, Joachim Tückmantel.

1) Couplers (Ed on behalf of Eric)

• Conditioning of ouplers 109 and 110 is progressing well. 125 kW continuous has been reached and they are presently at 200 kW pulsed 100 us/10 mS.

2) SM18 and ACS Modules (Pierre)

• Cycling: Module 2 cycling is now completed. A final cool down was done this week. The frequencies are stable, within 1 kHz of the measurements made last week. In the future we will probably not be able to do fast cycling with super-insulation not fitted inside the modules; helium consumption is three times that with the super-insulation and the helium plant is now stretched to its limits with the recently increased requirements for the magnets.

• **Control System Tests:** The warm up of module 2 is being used to test the new acquisition and control system for the SC module. Temperature measurement has been checked and helium level and pressure interfaces are presently being tested.

• Waveguide Power Measurements: (Olivier) New (linear) power meters have been installed in the waveguide system and have been calibrated. This will help to resolve some previous doubts about the measurements of these powers during conditioning..

• **Software:** Some useful new synoptics have been developed for the control system by Olivier together with Luca (using Labview).

• Cooling Water: (Olivier) Recent water problems have been resolved; an expansion tank was completely full.

• **Planning Information:** Both short-term (weekly) and long term planning files have been put on the AB department server. <u>Links to the latest versions</u> of these have been put in the LHC RF Web Page. A file summarizing the present status of the work on the modules is also present.

3) ADT

• **Drive Amplifiers:** Three amplifiers have been delivered and are being tested. There is an anomalous switch ON of RF for a short period when the DC supply is switched OFF.

• Anode Supplies: With 8 supplies on one transformer the network harmonic components exceed the 5 % norm. While this may not necessarily be a problem for other equipment (to verify) we have to be sure that it does not affect the operation of these power supplies themselves. Secondly, there are doubts as to whether the existing transformer can handle all power supplies. This is being followed up with TS-EL and André Beuret (AB-PO). Imposing operational constraints, to keep power and harmonics within defined limits, may not be an easy or safe solution.

• **Dubna:** High quality type steel 304L, better suited for construction of the kickers (welding of flanges) and already available to Dubna from Russian manufacturers, may (hopefully) be accepted by CERN TS-MME specialists.

• **Feedthroughs:** The smoothed out versions have been completed by the firm and tested at CERN. The nominal voltages are just attained. Use of field deflector pieces brings improvement for DC but not for RF. A further check will be made after a gold plating the conducting pin.

4) Infrastructure (Volker)

• **Platforms:** Design cannot proceed further without input from CV. Contact is also needed with CV on other issues, i.e. B867 pump, cost of UX45 'new layout', etc. Responsibilities need to be established by the CV Group leader. (Action: Trevor)

• **Design Work:** Sylvain will continue to provide support for the completion of UX45 integration, which remains the responsibility of the RF group.

• **Coax Cables:** The specs are now completed. Cable types, normal and phase compensated are defined. The invitation to tender should go out early in July and a specification committee will take place soon.

• **TCC:** Note that the agenda for the next meeting on 25th June includes "First draft of new installation and commissioning schedule, S. Weisz".

5) Naming. (Ed)

• **Racks:** Racks in UX45 and SR4 will be named according to the standard convention and is the responsibility of J-C Perrier, with verification by the equipment responsibles.

• **Machine elements:** This needs to be agreed before we proceed much further with the cabling and layouts. Following on from the standard installation naming listed by Volker, a slide showing three proposals for <u>operational names of equipment</u> was presented and discussed.

- i) Shorthand version of layout names: Operationally, a system of numbering of identical pieces of equipment is preferred to the system of letter sequencing according to position from the IP.
- ii) Numbering in CW direction independent of beam: Simplest system, easy for ACS where it can easily be remembered which cavities act on which beam. More difficult for ADT and it would be very confusing for pick-ups, where for example the radial PU for Beam 2 is the first radial PU and that for Beam 1 is the second in the clockwise direction.
- iii) Naming and numbering depending on the beam, following the direction of the beam: Slightly more cumbersome for ACS, preferred for ADT. The separation of equipment by the beams is clearly of importance in any operational context.

It was agreed that a consistent approach be adopted for all equipment and that the third system should be taken.

6) Signal Monitoring and Diagnostics: (Andy) CO group are establishing the number of 'OASIS' signal monitoring crates needed. Our numbers were reduced from initial estimates two years ago, pushed by the budget allowance in the CtoC and by the fact that much of the Low Level RF equipment will have its own embedded diagnostics. However there is clearly a need for independent monitoring on certain signals for cross checking (and for additional 'dynamically allocated' Post-Mortem in the event of problems). We also have a need for monitoring in the low frequency range, not necessarily using the high speed digitizers which are standard in the OASIS system. The requirements for all systems have been estimated and listed by Andy and this list should be checked again with the other specialists.

(Action: Andy with Philippe, Wolfgang, Eric.)

7) Software: (Andy) Following our presentation of requirements and options to the AB-CO Technical Committee on 6th May 2004, a number of discussions have taken place with CO group specialists in recent weeks. On the PLC side IEPLC will be used, consistent with what has been done for LEIR RF, together with FESA in the front-end. The integration of FESA and IEPLC is an agreed objective for AB-CO and will be accomplished in FESA Version 2, available to users late in the year. This is consistent with our choice of FESA for the LLRF system. The solution for 'expert software' has also been agreed: we will use LabView for prototyping 'expert' applications in SM18 and other test stands, however often used and fully developed applications, as well as those of interest to operations in the CCC, should be ported to JAVA. The connection of LabView to CMW is being discussed, also the possibility of arranging LabView software such that the present OPC connection could be changed to CMW with minimum modification of the application. These basic lines and relevant support requests have been agreed with B. Frammery (AB-CO) and follow up will now proceed with the different specialists.

Next Meeting: 2nd July 2004 at 08:45 in the JB Adams Room 864-2-B14.

E. Ciapala, 21^{st} June 2004 Slight corrections to Section 3) ADT on 20^{th} June 2004.