LHC RF Meeting
8th. October 2004

Present: Luca Arnaudon, Philippe Baudrenghien, Olivier Brunner Andy Butterworth, Edmond Ciapala, Wolfgang Höfle, Pierre Maesen, Volker Rödel, FrodeWeierud.

1. ACS Modules and SM18

- **Module 1 Conditioning (Eric/Pierre)** Conditioning has continued, the coupler of cavity D is ongoing. It is slightly slower than the others, possibly due to cleaning of the antenna with alcohol done after conditioning in SA2. (Some suspected oxidization traces had been seen on removal of the coupler from the test cavity). However progress is steady and 200 kW pulsed has been reached so far.
- **General Planning**: **(Pierre)** Module 1 will remain under test until conditioning is completed and all possible LLRF tests have been done. We estimate around two more weeks of conditioning. The situation will be reviewed at the end of the month.
- **Low level tests (Philippe)** Overall open loop response and group delay measurements have been done with cavity A. The response and group delay (570 ns) are as expected and are close to the LHC value of around 650 ns. Signal levels in the drive chain were also set up, such that the 100 W pre-driver is kept within its operating range. The klystron resonance sideband was found to be slightly away from the desired value on this prototype klystron and this was adjusted by retuning the second cavity. **(Olivier)**

!! Two unexpected features were however observed:

1) **Qext:** The Q of the cavity appears to depend on applied RF power; with the coupler fully in the low power value is 18,000 and with high power (300 kW) the measured value drops to 14,000. This needs to be re-checked.
2) **Quench:** The technique of frequency sweeping of the test signal on top of the fixed carrier resulted in several 'quenches' (large helium loss) in the cavity above 200 kW forward power, even for cavity fields below that to which the cavity had been conditioned. Conditioning with an additional FM signal has now been implemented **(Eric)** and the sweep test should be repeated once this has been done on one cavity. For the moment the coupler polarizations remain off.

- **LLRF VME crate control: (Andy)** A problem was found with readback of data; this is due to problems with reset of the CPU and FPGA on system start-up and is being investigated **(John)**
- **Second bunker operation: (Olivier/Luca)** All equipment and controls for the 352 MHz klystron are now in place. The heater regulation system has just to be checked and HV tests can start next week. Keeping water circulating through both 352 MHz and 400 MHz klystrons might mean excessive water flow in the load of the 352 MHz klystron. We do however have other loads, in SA2, which could handle this.

2. ACS Coupler Progress (Ed for Eric)

Leaking around the second polarization ceramic of coupler 113 has now been confirmed to be due to the sealing gaskets above and below the second ceramic. The machining of material from the copper ring from which the gasket is made, in order to form the critical knife edge seating, is insufficient. The result is that on tightening the body of the gasket ring comes into contact with the niobium ring of the ceramic at other places around the circumference than on the knife edge. Test are ongoing in the lab to find if a solution with the existing gaskets is possible and at the same time we are in contact with the supplier to obtain new sealing gaskets of the correct dimensions and profile as soon as possible.

3. ADT Progress (Wolfgang)

- **Anode converters:** The firm was visited on Tuesday 5th October, to agree on the 6-pulse configuration. Some details were discussed, cubicle size, rail separation distance, additional studies etc. The contract will now go ahead but the correct financial procedure has still to be resolved, by FI department.

- **Amplifiers:** One amplifier will be tested at Dubna (November?). The others will be completed here. A global contract is to be arranged with Thales and tetrodes for all the different RF systems are to be ordered together.
- **Kickers in tunnel:** Vacuum group would like to move certain kickers by 17 mm in order to use standard connecting pieces. This would also have to be updated in the layout data base (S. Chemli)
- **Special Pick-ups.** There is a request by J-P Koutchouk (AT-MAS) for special pick-ups to be mounted on the kicker tanks. They are to be used for tune measurements with the dampers.

The above two issues need to be followed up with C. Boccard (AB-BDI) and C. Rathjen (AT-VA)

(Action: Wolfgang, Volker)

4. Coaxial cables (Volker)

We have to check our exact requirements by the end of the month, to make the order in November. The numbers of cables to have phase compensated equivalent specification (<10 ppm compared to the normal 25 ppm) must be decided. **(Action: Wolfgang, Philippe, Thomas)**

5. Faraday cages for UX45 (Philippe/Volker/Olivier)

- **Installation:** We have decided that the cages will be assembled in UX45, by the manufacturer or their sub-contractor. Installation is to be in October/November 2005.
- **Specification committee:** the date should be fixed very shortly (3 weeks notice is needed by the department) For this a final specification will be needed. Since the cages will be assembled in UX45, by the manufacturer or their sub-contractor, the standard information on the regulations concerning work by outside contractors underground must be included in the specification. Some information on the expected state of equipment in the vicinity of the cages (cable trays, HV bunkers, platforms etc) must also be supplied to allow the supplier to estimate the time needed for installation. This is dependent on the planning. It was agreed that J-C Perrier should provide this information, as well as generally following up the installation and its preparation.

6. Low Level RF (Philippe)

- **ACS tests in SM18:** See above, section 1.
- **Fast timing and distribution:** Meetings have been held with AB-CO and BT. There is a proposal to give the RF group the complete responsibility for transmission of fast timing signals all the way to the experiments and other users. The original agreement with CO was that they would do distribution to the experiments. We have to decide if the extra workload is justified in order to have a possibly more coherent and more easily maintainable system.
- **Damper synergy:** While common damper feedback modules serving both SPS/LHC and PS systems are more complex, they are feasible and the effort is justifiable. Integrating into different control systems however remains a problem. (e.g. function generator)

Next Meeting: Friday 22nd. October at 08:45 in the JBA Room 864-2-B14

E. Ciapala, 13th October 2004 (Corrections ADT added 13th Oct pm)