LHC RF Meeting

16th March 2007

Participants: Maria Elena Angoletta, Luca Arnaudon, Thomas Bohl, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Eric Montesinos, Wolfgang Höfle, Elena Shaposhnikova, Joachim Tückmantel, Daniel Valuch, Frode Weierud.
Excused: Pierre Maesen (RAT Meeting)

1. UX45/RUX45 installation/commissioning

Olivier gave a brief résumé of the status (Week 11):

UX45/RUX45:

- **Water:** The system is partially under pressure. We are waiting for the green light to switch on towards the equipment.
- **SC Report:** We will get results next week.
- **Cabling:** The A5 team is completing the cabling for the arc detectors. **NOTE** that any final cabling requests for TS-EL need to be made by Week 12.
- **ADT Layouts & cabling:** The UX45 switch matrix cabling details in the ADT racks still have to be completed. Some TS-EL effort may be needed. Additional connectors need to be purchased. Cabling for ADT fast digitizers and clock distribution in UX45 also needs to be added.
- **Cryo and WRL:** A pressure test was done. Our installation of the HeG return lines is also nearly finished and these will also be pressure tested.
- **Vacuum:** Missing parts to be installed by mid-April. A passerelle will then be put in place over the beam pipes between the centre modules.
- **Cool down Sector 4-5:** Reminder: Scheduled for end of May (Week 21). Regular RAT (Reunion Avancement Travaux) meetings are now being held every Friday morning at 08:30 at P4 (Surface building SX4 second floor). Pierre will be our main representative.

2. ACS Modules, Couplers and SM18

He tank Pressures & Safety Valves: Luigi Serio (AT-CR) will provide calculations on maximum pressures under various fault conditions, with the new release settings and dimensioning for the He tank safety valves and rupture discs. Preliminary indications are that due to flow rate limitations pressures may not be as high as initially feared. Recent measurements and logging of pressures on the C (inlet) and D (outlet) lines (and the wrl) during point 8 cool-downs will also be studied.

Single cavity and LLRF tests: The single cavity module can be run at medium field and high Q. We can now run until the end of next week, to continue the LLRF tests on the feedbacks. These are giving encouraging results. Peak to peak phase noise (from PC mains harmonics) is reduced to fraction of a degree. The cavity and coupler will be leak tested after warm-up.

SA2 and klystron:

- **Klystron:** Olivier will visit Thales early next week on the early failure of the SA2 klystron. The klystron has already been sent back. Another klystron with relatively few hours running was checked and showed signs of the same surface discoloration on the inside of the collector cover. Note that in SA2, the klystron was not run continuously at full DC power, and only run at maximum current when maximum RF power was needed at the end of conditioning. Possible causes being studied are: bad alignment of the gun, focus coils not aligned correctly, or problems with the cooling water flow around the collector.

- **Coupler Conditioning: move to H112:** There is sufficient space in B112. On the controls side, much of the equipment is latest version - there is just the PLC to upgrade and change the software. Luca will do a detailed check next week.

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3. SR4 and Equipment

- **ADT Racks:** The rack layout for ADT equipment at the surface has been done.
- **SR4 ventilation units:** Jean-Claude is following this up with TS-CV. He has provided our expected kW cooling requirements. (Estimated at about half of that needed in SR4 during LEP running). Based on this, TS-CV will probably only do partial re-furbishing of the ventilation system.

4. LLRF

- **ADT Electronics:** Work on the 1-T feedback/damper module is progressing. The fast serial link from the FBT module for the beam position calculation needs to be installed in the damper module and the FPGA code done. Note that there are 8 analog front end processing modules and 8 beam position modules in total. We need to have damper feedback operational for first beam.

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- **Schottky:** These systems will require some space in UX45 in the damper racks and need to be supplied with 400 MHz reference signals. A layout drawing will be made.

5. AoB

- **IONS:** The work for ions is limited to SPS, i.e. accelerating to full energy in SPS but not transferring to LHC. A new digital fixed-frequency acceleration system is being put in place in SPS for this.
- **Recent LTC** (LHC Technical Committee) G. Arduini gave a presentation last week on LHC "RF capture and measurements with circulating beam", based on input from Philippe and Andy. One issue raised (amongst others): handling injection and ramp if SPS, LHC B1 and LHC circumferences are outside limits for the planned injection scheme.

Next Meeting: Friday **23rd March** at 08:45 in the JBA room.

NOTE: that due to the RAT meetings at P4 for hardware commissioning, LHC RF meetings will be held on Thursday mornings, starting with the meeting of 29th March.

E. Ciapala, 22nd March 2007.