LHC RF Meeting

23rd February 2007

Participants: Maria Elena Angoletta, Luca Arnaudon, Philippe Baudrenghien, Thomas Bohl, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Pierre Maesen, John Molendijk, Trevor Linnecar, Daniel Valuch, Frode Weierud.

1. UX45/RUX45/SR4 installation/commissioning (Olivier et al.)

Olivier gave an update on the status of the various activities (Week 8):

- **Safety Visit:** G. Salomon (SC-GS) has made a first inspection of all the underground installations. The electrical inspection is to be carried out by an external firm. We will receive a list of any defects or improvements needed. We should check that the PU equipment racks on the cryo side have been included. **(Action: Olivier)**

- **ACS in UX45/RUX45:**

  - **Electrical modifications for ACS Power Converters:** As presently installed, the electrical system can only provide ¾ of the power needed for operation of all klystrons at full power. Certain cables need to be upgraded and new current measurement transformers fitted. A meeting was held with TS-EL on 9th February to discuss modifications. The cost is estimated at ~ Eu 7.5k. Latest planning estimates now are that the cabling can be done in weeks 9-11, and current transformers installed in week 11. This should therefore have minimal impact on RF testing.
  - **Cabling:** The main cabling campaign is now complete. 'Untidy' cabling inside certain racks has been very much improved. Cabling in ACS signal distribution/diagnostics racks has been completed.
  - **Water:** Still waiting for demineralised water (Planned for week 9) Some ACS klystron valves will be rotated 180 ° to improve access. The systems will need to be re-purged but this has to be done in any case.
  - **Arc Detector Installation:** in progress.
  - **Bunkers:** Still waiting on filling of cable holes (TS-CE)
  - **Cryo and WRL:** Progress continues, the WRL lines to the outer modules have now been put in place and are clear of the waveguides. HeG capillary tubes will be put in place next week.
  - **Coupler mechanics:** These have practically all been installed, controls and connections tests are in progress.
  - **Rack cooling Units:** These are now becoming operational. We have to adjust the apertures in the bottom of the racks to get the best flow in all the individual racks.
  - **Magnet transport:** For the moment we are unaware of the status and any future plans, but fortunately no incidents.

- **Faraday cages:**

  - **Racks Powering:** The cages use only UPS 220 Vac. A circuit breaker is already installed near the entry. Equipment stop or external stop (e.g. from internal temperature interlock) can easily be added. Note that from the safety point of view the switches on the mains connector boxes inside the racks are considered adequate.
  - **RF Cables:** These will be re-tested, with 50 ohms or short at the ends. ((5 cables per cavity).
  - **False Floors:** Installation has been fully completed; all cables on the floor are safely covered.
  - **HOM loads on platforms:** Cable trays are being installed now.

- **ADT & APW in RUX45/UX45:**
  - **RF cables:** Testing is in progress.
  - **Interlock and controls tests:** Now in progress.
  - **Patch Panels:** Needed for connections to the magnets containing ADT pick-ups.
- **SR4:**
  - **ADT electronics and clock signals:** Before the DIC can be completed the final layout of the low level ADT system needs to be defined. This is being worked on by Daniel and Wolfgang and will be finalized on Wolfgang's return. Similarly the layout for the clock distribution is presently being finalised by Jean-Claude and Philippe.
  - **Ventilation System:** Status needs to be followed up with TS-CV. **(Action J-C Perrier)**
  - **Floor panels:** Status to check with J-C Perrier.

2. ACS Modules, Couplers and SM18

- **Pressures in He tanks:** SC have re-visited the operating pressure limits for the He tanks. A maximum operation pressure of 1.6 bar is calculated, based on the design, materials and welding. In fact all tanks have seen 2.0 bar; some probably considerably higher during the occasional cryo incidents in SM18. The questions of operating pressure, valve and rupture disc sizing is again to be discussed, together with cryo and SC

  While there is no real safety issue, the tanks being housed in a large cryostat with its own rupture discs (at 1.4 bar absolute - 0.4 w.r.t. atmospheric) we certainly have an interest in keeping the operating pressures as low as possible, for example using the warm recovery line to release before the quench valve. To be followed up urgently with Cryo and SC. **(Action Ed, Pierre)**
- **Couplers 131 and 134:** Conditioning is continuing in SA2.
- **Single cavity module LHC21:** We will keep the cavity in the bunker till the last possible moment to do maximum LLRF testing, at the expense of delaying the LHe level filling tests for cryo. If all goes well with couplers, we will be able to install Module 4 (Europe) in May to do both LHe level tests and conditioning of the module.

3. LLRF

- **Setpoint module (John):** Tests are progressing. The function generator interface is now being tested. Also the digital feedback loop and the low-pass filter (on the RF feedback modules). Two more modules of this first version will be made.
- **Beam Phase (General purpose FBT) module (Daniel)**: The problem in the VME interface has been solved. Initial tests on ADC noise have been done. The module uses 16 bit resolution and noise is around four LSBs. (Similar levels to ACS RF front end, LEIR digital has 1.5 LSBs for 12 bit resolution)

4. AoB

- **TCC/ICC meetings:** Following comments on the survey exercise after installation, we will update our layout drawings and tables and put them in CDD/EDMS. The 3.5 cm error in the cavity centre positions presently in the database will be communicated to S. Chemli. (Note that the module positions are correct in the database !)
- **Schottky pick-ups: (Philippe)** Cabling and reference signals have not been forgotten.

Next Meeting: Friday **2nd March** at 08:45 in the JBA room.

E. Ciapala, 1st March 2007.