# LHC RF Meeting
16th April 2004

**Present:** Luca Arnaudon, Philippe Baudrenghien, Andy Butterworth, Edmond Ciapala, Eric Montesinos, Volker Rödel, Joachim Tückmantel, Daniel Valuch.

**Corrections to minutes of meeting 2nd April 2004**

**Present:** Eric Montesinos
**Item 4) ADT:** Anode power converters: the letter of intent was sent out.

**1) SA2 Klystron and Coupler Conditioning** (Eric)

- Following the klystron repair RF could again be applied to the couplers. During week 15 (before Easter) the klystron was first run at 60 kW; then the couplers were conditioned up to 200 kW, from 2ms/10ms pulsing to continuous. Each increase in HV on the klystron brought an increase in the vacuum which slowly returned to an acceptable level. However, when running above 62 kV and 370 kW RF pulsed at the beginning of week 16, vacuum again increased but did not recover. Conditioning is therefore stopped at this level and any intervention on the klystron will be decided next week.

**2) Coupler Production** (Eric)

- Progress on the next group of 4 couplers has been good, assembly will start next week and the two couplers needed for the next module are expected to be completed, baked-out and leak tested in three to four weeks time.

**3) Installation of LHC klystron in SA2** (Eric & Luca)

- Space can be found for the klystron and circulator chassis in the area where the SLAC klystron now stands. Waveguides can be quickly re-arranged. HV connectors are identical for the present EEV klystron and LHC klystrons.
- Luca presented 'crash program' modifications to allow rapid installation of an LHC 400 MHz klystron in SA2. The klystron controls will be made LHC standard while HV and other equipment will receive minimum modifications for now. The diagram shows the new klystron and circulator equipment chassis in blue. New standard LHC klystron equipment and controls are shown in green: i.e. power meters, remote I/O and interlocks, focus supply and touch screen. Equipment remaining for now (in grey) consists of the LEP HV equipment controller and VME controller, klystron heater controls and DCCT electronics. Equipment needing modification (yellow) consists of interlock junction boxes and the 'Wattcher' chassis. Additional functions (heater control and HV status) normally in the HV controller of the LHC system will be added into the klystron line PLC. The modifications needed have therefore kept to a reasonable minimum, only a few new cables are needed and we already have all the parts. The main work is the modification to the standard Line controller. Around three weeks of work overall are estimated. The aim is to complete the work and test the installation to complete conditioning of the present couplers as quickly as possible.

**4) SM18 and Modules** (Ed on info from Pierre)

- **Module 1:** thermal cycling has been completed. The frequencies are within tolerance; a further complete cool down will be made next week and the results verified.

**5) Ordering of Flexwell Cables** (Volker)

- We are fully responsible for the ordering of these cables, ST-EL consider the specification of these needs RF competence. Since the expected cost will make this a contract procedure, possibly needing Finance committee approval, the administrative process is being started now. Market survey documents (technical spec. summary, qualification criteria and technical questionnaire) are being prepared by Volker and Wolfgang for the next Specification Committee meeting on 29th April. Connectors will also be part of the specification.

**6) Faraday Cages in UX45** (Philippe)

- **Layout:** It was considered that modifying the design from that of a simple box, allowing 'cut-aways' for concealed cable access and hence avoiding shifting 50 cm away from the klystrons, would compromise the design and unduly increase the cost. Protective boxes around the cables arriving from the floor are preferred.
- **Procurement:** Market survey documents are being prepared. The question of responsibility (CERN/supplier) for final UX45 installation is not part of the MS technical specification. An effort will be made to prepare this also for the Specification Meeting on 29th April.

**(Action: Volker, Philippe)**

**7) UX45 Cooling and Ventilation** (Volker)

- **Meeting TS-CV:** A meeting was held on 6th April on UX45. **Some points:**
  - The UX 45 Faraday cages will be cooled with ex-LEP RF racks ventilation units
  - They will be situated on top of the bunkers – We should follow up agreement on this between TIS and CV; so that we are informed of any modifications needed to protect HV equipment from water leaks.
  - Any proposal to put the main RUX45 tunnel ventilation units in the UX, with ducts passing through the tunnel wall (to allow removal of additional roof blocks for transport) would not be acceptable.
  - Three racks will be taken from the ADT group in UX45 to allow space for two more ventilation units and easier access.

**8) Equipment naming** (Volker, Ed)

- **Racks naming:** J-C Perrier has almost finished compiling the list of rack names. It will be available next week.
- **Equipment naming:**
  - The use of 6-letter equipment codes as was recently agreed for some pick-ups, may not be allowed (5-letter maximum!).
  - There is still discussion on 'Operational' equipment names. For pick-ups we will take the full installation layout name. For cavities and dampers 'alias' names are being discussed. OP group will also be consulted.

**9) Low Level RF progress** (Philippe)

- **Tuner RF Front-End**
  - Test equipment is being made to measure the noise levels exactly (number of LSBs)
  - SM18 Test: The card can very soon be tested with 'real' cavity signals. In particular the capture and display of the RF signals can be tested. Software will be needed for the display of the recorded data. Basic FESA software exists and OASIS may also provide a solution

**(Action: Andy)**

- **Other RF electronics modules:**
  - Tuner control: is now with the design office.
  - Clock generation & clock distribution: being tested.
  - RF feedback: now in development.

**10) AoB:**

- **SMA cables:** (Philippe) Ready made cables with SMA connectors are now extensively used for connecting RF equipment. They are not CERN standard and those found in industry do not match CERN specifications (halogen-free). An accepted standard solution is being looked for with the stores responsibles by Donat Stellfeld.
- **EMC**: A meeting will take place with AB-PO group (G. Fernquist and F. Bordry) to look at measures taken by them to avoid EMI problems in their installations.

It will be held in **B377 (near B30) Room R-004** on **Friday 23rd April at 11:00.**

**Next Meeting:** Friday 23rd April 2004 at 08:45 in the JB Adams Room 864-2-B14

E. Ciapala, 19th April 2004.