

LHC RF Meeting

9th June 2006

Participants: Luca Arnaudon, Philippe Baudrenghien, Thomas Bohl, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Trevor Linnecar, Pierre Maesen, Elena Shaposhnikova, Joachim Tückmantel.

(Corrections 16th June in red)

1. ACS Modules and SM18 (Pierre/Eric)

✚ **Module 5:** A coupler heat run was recently started on cavity ~~D~~ **A** (maximum power, coupler fully in, polarization off). After about 2 hrs and at just over 220 kW, a sudden vacuum burst occurred, probably from multipactoring in the coupler rather than activity in the cavity, since the field was low (2 MV/m) and there was no radiation activity. The cavity is presently re-conditioning normally. We will then repeat the test and then do a further test of 24 hours at least at full power with the polarization on. Vacuum events of this type are not unexpected; we know that reliable operation - especially with beam - relies on polarization. Cavity B has already had extended running under 'heat test' conditions. For LLRF tests last summer the polarization was sometimes used. Some conditioning was also often done between the different LLRF tests.

2. Couplers

✚ **Polarization coupler vacuum seals:** The latest batch of seals appears good. A coupler will be assembled next week and tested. Viton seals ~~will not be~~ **are not** used to seal the volume around the coupler during the leak test.

3. ACS Power (Olivier)

✚ **HV boxes:** The supplier has fitted new rounded HV connections (and no epoxy) on all klystrons and cleaned the inside of the boxes. We will inspect SM18 and H112 klystrons after a few hundred hours of operation.

✚ **New TCU development:** This is progressing well; the method of estimating the required circulator magnetization current has been determined and will be programmed in the micro-controller. We have suitable DC power supplies to drive the circulator.

4. APW (Thomas)

✚ **Series production:** APWs 5 and 6 have been assembled, in addition to numbers 2, 3 and 4 already done and measured. Bake-out should be done soon.

5. UX45 installation progress (Olivier)

✚ **Cabling:** Cabling in the UX45 trenches has started on the RB44 side. Cables from UX45 to the cavities are next. The last HV cables from the US to the bunkers will be pulled next week. Cable testing is also ongoing, in parallel with cable pulling.


✚ **Ventilation:** There is presently a delay of two weeks. Air ducts from the RUX45 roof-mounted ventilation units to the klystrons will be put in place at the end of the month.

✚ **Water cooling:** Modification of connections to BDI equipment has delayed progress, as has the removal and refit of cooling pipes around the QRL, which has also for the time being, prevented mounting of some waveguides across the walls.


✚ **RUX45 waveguides:** Waveguide mounting is otherwise going very well; the remaining waveguides, i.e. those through the large outer hole on the on the RB44 side, are now being put in place

and we are confident about the alignment. The tunnel slope (0.36°) has also been introduced in the waveguide support system, so that the cavity transition pieces and the waveguides will fit exactly (P. Martinez et al.)

6. UX45 earthing

 **Ground plane in rack areas:** A cost saving of 50 k€ could be made by not installing a complete ground plane of copper sheeting in the rack areas and between bunker zones, together with the necessary protecting floor.

However we have decided to install this ground plane. Its main purpose is to provide a low impedance return path for stray return RF currents between the racks and the Faraday cages, avoiding that these currents pass through outer conductors of RF cables.

 **UX45 earth layout:** We should review the earth system layout of ST-EL (**CDD LHCEIE_4012**) with a specialist on their side (J. Gomez) in order to clarify a number of issues, not least the connection point of our HV bunker earthing lines in the machine tunnel. A full diagram, showing ST-EL earthing together with our own - including ground planes (above) - should be made and verified in UX45 for future reference.

7. AoB

LHC installation and commissioning: The final planning for each of these is being finalized by the management. As far as we understand at present, our hardware commissioning time is not under threat, but we may have to be prepared to look at some stage at even more optimistic schedules, their implications and consequences.

Next Meeting: Friday 16th June at 08:45 in the JBA room. (Note TCC meeting at 10:00 that day)

E. Ciapala, 9th June 2006.