

LHC RF Meeting

9th December 2005

Participants: Luca Arnaudon, Philippe Baudrenghien, Thomas Bohl, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Pierre Maesen, John Molendijk, Volker Rödel, Elena Shaposhnikova, Joachim Tückmantel.

1. Installation (Olivier)

✚ **UX45 CE work & platform:** There are fairly large errors in the geometry and positioning of the platform with respect to the original plans (40-60 cm at some points). Plans will have to be re-drawn accordingly, so that we can check the clearances for waveguides and verify the positioning of supports. In the area between the walls a metal support structure has been put in place to shore up the shielding wall. (See pictures – [floor view](#) and [upper view](#)). However one of the 45° supports (see upper view) has been conveniently passed through the access opening on the top of a temporary platform for QRL installation. This will prevent normal access to this platform for the QRL work and will probably also make it difficult to dismantle the platform. This will need to be resolved by the TS-CE and TS-IC teams.

We will request a floor grid at the top, between the walls, when all the other work is finished.

✚ **QRL co-activities:** The QRL in sector 4-5 will be pressure tested this coming weekend.

✚ **Cabling:** The 15 available HV cables from klystrons to HV bunkers have been installed. HV cables have been installed in US45. We are confident that a solution can be found for routing of 3/8 inch flexwell cables for ADT through the waveguide holes, leaving enough space for passing the waveguides through.

✚ **SR4 floor:** Reinforcing of the floor has been completed

2. ACS Modules (Pierre)

✚ **Module 4:** The frequencies have been measured. Three of the cavities have not moved from their original frequencies. One cavity has moved ~ 30 kHz upwards and will probably need to be fitted with springs.

✚ **Tuner bellows:** The new prototype bellows has now been fitted to the spare tuner drive frame. An unexpected problem was encountered. The screw drive was unable to support the force from the bellows under vacuum. Inspection showed the screw to be worn out, sufficient for Lab tests at atmospheric pressure but not under vacuum. A last remaining spare screw was found and fitted. We will now have to check the specifications and expected lifetime for this component. Fortunately replacement is relatively straightforward, even in situ. We will however look for a more robust replacement. Clearly slipping of the tuner drive is completely unacceptable in operation, even if the RF feedback system can compensate to some extent at low intensities.

✚ **Tuner cycling tests:** The present cycling tests are for the tuner bellows. The main tuning system has been tested before construction of the modules and we believe it to be sound. Once we are sure that the bellows problem - and now the screw problem - are solved we do not plan to do extensive cycling tests on a module before installation in the machine. It may however be a good idea to do such a test on the spare cavity, if it can be put in a workable state.

✚ **Motor Control:** We have not yet looked at the micro-stepping options for the tuner drive. Noise and vibration should be checked with the new cavity tuning control system, which we believe to be somewhat smoother than the old system.

3. APW (Thomas/+ Info from Eric)

✚ **PU01:** is now with AT-VA for vacuum tests.

✚ **PU02:** is now being welded in the central workshop.

4. LLRF

✚ **Module production (Philippe):** We need to produce 387 modules for LHC, in 23 different designs, for late 2006...

✚ **Handling of Modules (John):** Damage occurred to one of the tuner control modules, from ESD. Fortunately the only one chip was affected, a buffer chip which could be easily replaced. This is a reminder that we need to handle these modules with care, e.g. use anti-static wrappers and other precautions.

✚ **VTU [=VME Trigger Unit] (John):** Version 1 performs correctly and has been tested to 1000 MHz. It has also run for many hours with no glitches. A divide by 10 output is provided for bunch frequency synchronisation. Only minor mods are needed for version 2. (e.g. improved reset with delay).

✚ **Signal transmission to experiments:** Philippe has visited LHCb, at Point 8. Here access is possible underground with beam due to shielding walls. The fibre optic cable will pass through as many as 10 patch panels. The collaboration on the design of fibre transmission modules looks promising.

Next Meeting: Friday 6th January at 08:45 in the JBA Room 864-2-B14.

E. Ciapala, 13th December 2005.