

# LHC RF Meeting

23<sup>rd</sup> June 2006

**Participants:** Luca Arnaudon, Thomas Bohl, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Wolfgang Höfle, Pierre Maesen, Trevor Linnecar, Elena Shaposhnikova, Joachim Tückmantel, Daniel Valuch.

## Correction to write-up 16<sup>th</sup> June:

✚ **ADT B867 tests:** Tests on the signal processing electronics will not necessarily need to be done in B867. The signal processing module is presently with the design office for V1 update/mods.

## 1. ACS Modules and SM18 (Pierre)

✚ **Module 5 - Heat running:** Cavity D ran for an uninterrupted 26 hours at 6 MV/m and 250 kW, with polarization on. With polarization on vacuum stayed at very low levels. A good result.

Cavity B was also run for an extended period, but this was interrupted by a thunderstorm.

The overheating problems experienced last week during the running of cavity A were resolved by fitting a larger air filter. The high temperature inside the bunker (>38 °) certainly also contributed to the high temperatures seen. Overheating brings the risk of oxidation forming on the inner surfaces of the coupler inner conductor. Strong air flow needs to be maintained around the waveguide and into the coupler air circuit, with all air temperatures below 60 °.

Some anomalies in the interlock system and connections were found and corrected.

In preparation for installation and running in LHC, we have decided to nominate “interlocks responsables” for ACS cavities, ACS power and ADT. See AoB below.

✚ **Planning:** The transport of modules LHC 1 and LHC 3 now appears in the 8-week SM 18 planning [SM18 Planning Week25](#); they are scheduled for weeks 32 and 31 respectively.

✚ **Module 1:** Will go in the bunker next for check of the tuning compensation. The tests are at low power only.

✚ **Alignment:** We will be contacted in the near future by J-P. Quesnel (TS/SU).

✚ **Documentation:** We will put basic documentation for each module in EDMS at the end of the module tests, including the individual module logbooks (scanned).

**2. Coupler assembly:** We are waiting for new polarization seals.

## 3. APW (Thomas)

✚ **Series production:** Six APWs have now been tested. APW #2 was baked out this week; unfortunately a leaking feedthrough resulted. The feedthrough has been changed and a second bakeout is in progress. We may decide to reduce the pre-bake out heating of the feedthroughs from 225 ° to 200 °. We do not expect any fitted feedthroughs to suffer leaks during operation in the machine, if no bakeout is done. There is no risk from heating by the beam. The ferrites will heat to a maximum of 130 ° and there is little heat conduction to the feedthroughs.

## 4. ADT (Wolfgang)

✚ **B867 tests:** The installation is being checked out for power tests. Two amplifiers will be powered together and the power converter tested at full power. A test will also be done with 400 m cable from power converter to amplifiers, to ensure that there will be no problems for pulsed operation.

✚ **Amplifiers:** We will decide on which improved resistor design to take in the near future. Time & manpower will also have to be found for final preparation of material for shipment to Dubna.

✚ **Vacuum flanges for kickers:** Olivier has checked that the vacuum group is taking care of providing flanges which allow rotation. M. Jimenez should be contacted if further information is needed.

## 5. UX45 installation progress (Olivier)

✚ **Cabling:** Cabling in all areas is practically finished. Eight out of 10 HV cables from the US to the bunkers are in place. There are a few additional cables, e.g. for the local UX45 access system.

✚ **Bunker completion:** We will wait till all cables are pulled before finally sealing the cable passages in the bunker walls.

✚ **RUX45 waveguides:** All waveguides are in place. The critical work of final alignment is in progress.

✚ **Water:** We need to follow up progress on procurement of the klystron water circuit by-passes. (TS-CV and FI-PI)

✚ **Earthing:** This will be taken up in the coming week with J. Gomez (TS-EL)

✚ **Transport to and in UX45:** This will be discussed with transport next week. Shock detectors, with monitoring equipment are fitted on dipoles for transport. We should have the same facilities for all our equipment for transport to P4. The SC module suspended from its palonnier has just enough space to pass over the bunker into RUX45 (~4 m). (Transport for ADT kickers and APW monitors has also to be agreed, as has the means for lifting of ADT kickers into place)

✚ **Floor preparation:** S. Grillot will organize floor painting, in UX 45 and RUX45. The latter is still planned for the first week of August.

✚ **Crash Barriers in RUX45:** The installation of crash barriers was decided on some time ago (See history below). The whereabouts of the material needs to be checked. Clearly the necessary floor preparation should be done at the same time as for the installed equipment.

(**History:** Discussed July to November 2003. Initially decided only for ACN, as no space near ACS. [LHC RF 30 Jul 2003](#). Later decided OK for both ACS and ACN all the way along, with height of 50 cm and to be put in integration. ([08 Oct 2003](#)). Material available, to store in SR4 ([15 Oct 2003](#)) Material finally stored in SR4 ([22 Oct 2003](#)))

## 6. AoB


✚ **Interlocks:** In preparation for installation and running in LHC, we have decided to nominate “interlocks responsables” for each of the major systems, i.e. ACS cavities, ACS power and ADT. They will help to define the tests to be carried out, together with the equipment experts, and be responsible for ensuring that these are fully carried out before equipment running starts – initially after installation, after important modifications and after longer stops, e.g. shutdowns.

Olivier has started to modify a procedures document used for LEP.

✚ **Hardware commissioning review (Trevor):** A review, principally with group leaders, was held this week. The official planning is now for a 2 x 450 GeV colliding beam run in October 2007. This is preceded by a 1-2 month cold check-out period. We are continuing to insist on the need for a 6-month HW commissioning period with cavities cold and cryo fully tested and stable. However in the planning finally produced, there is a contradictory tendency to merge our first ACS “cold” tests with that of the cryo and QRL systems. To be followed up as the planning becomes more clearly defined and again as the commissioning progresses.

✚ **Planning for RF power tests:** Before HW commissioning proper, there will be an active period of power testing, both for ACS and ADT. Organizing this may fall outside the responsibility of the HW Commissioning Committee. We need in any case to verify readiness dates directly with CV, Electricity and Power Converter responsables.

(Action Ed, Olivier, Luca)

 **UX45 - Access to upper cavern:** We are in the process of finalizing the proposal for closing off the upper part of the UX45 cavern during RF tests. There will be two doors at the PZ45 end of the cavern, restricting access to the higher level walkways. They will be controlled by the RF group. The means of closing off the other accesses has to be agreed with AB-SU. The procedures for managing access in the upper cavern are being prepared.

**Next Meeting:** Friday 30<sup>th</sup> June at 08:45 in the JBA room.

E. Ciapala, 27<sup>th</sup> June 2006.