

LHC RF Meeting

16th September 2005

Present: Luca Arnaudon, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Wolfgang Höfle, Trevor Linnecar, Pierre Maesen, Eric Montesinos, Elena Shaposhnikova, Joachim Tückmantel, Daniel Valuch, Urs Wehrle.

1. UX45 Planning and Installation (Olivier)

✚ **Planning:** Olivier presented the [latest \(09/2005\) version](#) of the UX45/RUX45 planning, from H. Gaillard. The schedule depends strongly on the on QRL installation, to be completed end 2005 for Sector 4-5 and January 2006 for 3-4. Cabling starts now and continues to Easter 2006. This is critical and has to be coordinated with other activities - for example the closing of the shielding walls after the QRL is in place. A more detailed planning has to now be done, with TS-EL. Water and electricity should be finished by the first week in October. The Faraday cages will be installed in October/November (see below). HV equipment will be installed from March 2006 onwards. We plan to install two of the ACS modules at the end of March 2006 and the other two in early June. (The planning has now been adjusted to allow for the two month delay we now have for completing the ACS modules, with respect to the end of March we announced at the last TCC). We should check the plans for pressure testing of the QRL and whether this needs to be done with the ACS modules in place. **(Action: Ed with L. Serio)**

! The general delay in the installation planning does not yet cause a delay in the start of hardware commissioning, but clearly the time for pre-testing of equipment will be reduced.

✚ **Cavity installation: (Pierre)** A special lifting frame for installing the ACS modules has been ordered and will be delivered in a few weeks.

✚ **UX45 grounding:** All HV equipment and klystrons in UX45 will be grounded to the RUX45 tunnel earth bars. All klystron equipment, faraday cages, ACS and ADT equipment will be grounded via the cable trays.

2. ACS Couplers (Eric)

✚ **Coupler conditioning test stand:** The test cavity has been be chemically treated and rinsed, as well as the 'double tubes' onto which the couplers are fitted. The test stand is now being re-assembled. The vacuum pump has been checked and some particles found and cleaned out. The cause of the contamination is however still not clear; we will therefore have to check all equipment again after the next two couplers have been done.

3. ACS Modules and SM18 (Pierre)

✚ **Immediate program:** LLRF test will continue next week, then HOM measurements will be done. Module 5 will then go into the bunker for cold tests of the tuning compensation.

✚ **Long term planning:** There will not be time to condition two more couplers, fit them on a module and start power tests on a module before the cryo shut down in December. A new [proposed planning Sept 05](#) was presented. Module 4 would be completed but power tests in the bunker would only start in late January after the cryo stop. Modules 1, 2 and 3 would then be He tested (without power) after the tuning and cryo mods, four modules being completed by end May 2006. (2 month delay). Module 5 ('Spare') would be finished by end September 2006.

Another strategy would be to do thermal cycling on module 4 before the cryo shutdown, to verify that tuning compensation is not needed. (At present we are taking the risk that this is not the case). Module 5 would be completed including all cryo mods, have couplers fitted and be tested in January. Additional manpower may help for work on module 4 but cannot produce a drastic overall improvement due to the critical nature of much of the work.

✚ **Tuning compensation: (Olivier)** New versions of the springs have been made to allow fitting of an insulating washer. These will be fitted to module 5 next week. (8 springs – 4 cavities). We have checked that the pressure rating (4000kg/cm²) of the type of glass fibre reinforced epoxy washers to

be used and its radiation tolerance (10 MGy) are well within our limits. We should however obtain the exact type and manufacturer name of the material (waiting on feedback from central stores) and check against data in the 1998 yellow report on radiation properties of this type of material [Compilation of radiation damage test data, pt.2 2](#) by H. Schönbacher et al.

🔧 **Tuner Bellows:** S. Sgobba TS/MME has found that the fault has been due to the weld between the bellows and the collar, with clear signs of fatigue (radial marks). An improved design of the part of the collar which takes the weld was suggested. Discussions have followed with other specialists in TS and in AT.

4. ADT (Wolfgang)

🔧 **Water cooled resistors:** We will receive four modified resistors (with suitable reinforcing to prevent cracking of ceramics due to pressure in the steel cooling plates) at the end of the month. In any case water pressure needs to be kept below 6 bars. TS-CV will be asked (via J Inigo-Golfin) to help with calculations, based on flow and pressure measurements from the test stand in B867. At present we are improving the test stand water system to allow sufficiently precise flow measurements.

🔧 **Anode converters:** Four are ready for shipment, minor changes have been made by the supplier; we do not expect this to affect acceptance. All will be power tested in B867, to the power levels allowed in the test system.

🔧 **Supports:** We have accepted the modified design of the support system by JINR.

🔧 **SR4 floor reinforcing:** Some improvements were proposed by TS (D. Parchet) and these have been done.

🔧 **Layout and Databases:** New drawings of the ADT twin kicker module elements 'Left' and 'Right', have been provided by JINR. The new names and details, such as dimensions, positioning of fixing points and alignment markers, vacuum connections etc. can now be put into the database.

(Action: Olivier, Wolfgang with S. Chemli)

5. **APW:** There will be some delays in fabrication, but this is not critical yet.

6. **Faraday Cages:** These have just been delivered and are at point 4. Installation will start 3rd October. Organization of safety courses and plan de prevention for the contractor's personnel, VIC and AOC are being handled by J-C Perrier. We estimate 3 to 4 weeks for the installation.

7. AoB

🔧 **Stepping motor drive for ACS cavities (Daniel)** Microstepping or modification of the drive pulse to the tuner motor can be expected to limit the potentially damaging excitation of resonances in the tuning mechanism. We should see if this can be tested already with the existing electronics.

🔧 **Series production of electronics: (Wolfgang)** The work plan for LLRF has been discussed with TS-DEM. We will ask them to order all components for production of 25 tuner drive control VME modules.

Next Meeting: Friday 23rd September at 08:45 in the JBA Room 864-2-B14.

E. Ciapala, 22nd September 2005.

Outstanding Actions (Reminders)