LHC RF Meeting

2nd March 2007

Participants: Maria Elena Angoletta, Luca Arnaudon, Philippe Baudrenghien, Thomas Bohl, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Pierre Maesen, John Molendijk, Eric Montesinos, Trevor Linnecar, Elena Shaposhnikova, Daniel Valuch, Frode Weierud.

1. UX45/RUX45/SR4 installation/commissioning (Olivier et al.)

Olivier gave a résumé the status of the various activities (Week 9):

Safety Visit: We have had some initial feedback. Barriers will be put around the ADT power converters in SR4.

Olivier will check that the electrical checks for PU equipment racks on the cryo side have been included in the inspection**.**

UX45/RUX45:

- **Water:** Filling the plant with demineralised water has now started. Ventilation systems are being started up, however the main ventilation units can not be switched on until the RUX45 roof is in place. Work in the RUX45 region is not intense at the moment and any long periods of work near equipment being baked out will soon be finished.
- **Cabling:** Some cables still being put in place, mainly for the access system and ODH alarms.
- **Electrical Distribution boxes for ADT:** All in place and cabled.
- **Vacuum:** Bellows are still missing for the ADT kickers. Electron stoppers are not yet in place, due to modifications requested by the access team (open/close status contacts) and lack of bellows.
- **Cryo and WRL:** This appears to be finished. HeG capillary tubes for (cryo system measurements) are also in place. Our work on connecting the HeG return lines is progressing normally.
- **Bunkers:** Still waiting on filling of cable holes (TS-CE).

SR4:

- **DiC ADT electronics and clock signals:** Daniel and Wolfgang have prepared and checked all the necessary plans. Jean-Claude Perrier will now compile the DiC
- **Ventilation System:** Status is being followed up with TS-CV by Jean-Claude Perrier.
- **Floor panels:** Jean-Claude has confirmed that he will look after improvements
- **Roof on control area:** Jean-Claude has received an estimate – Euro 17,000.

2. ACS Modules, Couplers and SM18

Couplers 131 and 134: Conditioning in SA2 has reached 250 kW pulsed. However the klystron vacuum is bad and conditioning cannot continue with this klystron. The klystron has 15,000 hours and is well inside the expected lifetime (although over the guaranteed hours). The klystron will be taken to H112 and opened up. This will be followed up with Thales next week. Note that these klystrons are specified and designed to operate with full power to the collector, and the long term pulsing during conditioning should not cause problems with the collector. We believe the klystron water quality to be correct, but this must now be checked.

This means that we now have very few spare klystrons (Three). Spares need to be ordered.

We now have to decide: either to take the couplers as they are and continue conditioning when mounted on the module, or to install a new klystron in SA2. Also the future of SA2 should be considered; we could move the coupler conditioning to H112, or even SM18.

- **Pressures in He tanks:** A meeting has been organized with SC and Cryo specialists for next week. Operating with protection at the SC 'recommended' maximum pressure of 1.6 bar is clearly desirable for He tank lifetime and we would like cryo to agree to this. Safety valves are presently at 1.8 bar. The questions of overall operating pressure levels, valve and rupture disc sizing would also need to be analyzed again, together with cryo and agreed with SC.
- **Single cavity module LHC21:** Tests have continued on narrowband feedback and Setpoint modules – see below.

3. LLRF

- **Feedbacks:** The digital feedback response, cavity antenna to drive input, was first tested then the overall loop response measured. There is 20 dB loop gain in a pass band ± 3kHz around the fundamental. Closed loop tests are the next step.
- **Setpoint module:** This provides the reference for the feedback loops. The prototype module has been installed and connection to the feedback modules tested. Step response of the loop will be tested by making step changes in the external input from the longitudinal damper, via the corresponding VME registers.
- **RF modulator:** The V1 prototype has been received, the FPGA programmed and some functionality tested successfully. (e.g. the VME interface). It contains the klystron polar (phase and amplitude) loops. Tests can be done during the cryo stop, without the cavity using a waveguide short, but will have to fit in with water availability.

Next Meeting: Friday **9th March** at 08:45 in the JBA room.

E. Ciapala, 8th March 2007.