


LHC RF Meeting

21st November 2007


Participants: Thomas Bohl, Andy Butterworth, Edmond Ciapala, Pierre Maesen, John Molendijk, Eric Montesinos, Frode Weierud.

1. P4 & general tests

 **Test of the access systems for cavity powering in sector 4-5:** First test of the access system were done in the afternoon of Friday 16th of November. The zone was searched and closed following normal procedure. The system of delegation for RF tests was successfully checked. Doors forced, one by one, by the access team to verify cutting of the 18 kV cell, the ACS MCBs and the RF drive for each door. Some points:

- Re-setting of the 18 kV cell after each cut needs intervention by a TS piquet. This is not acceptable; the reset will need to be made remote via CCC for future operation. For the present tests we will rely on the other interlocks. (G. Roy to approve this)
- The doors at the ends of the RF zones can be forced too easily. An unauthorized access occurred already during the early part of the tests. Better warning panels will be put in place and some protection installed over the handles.
- On the other hand, entering via the access door is complicated, several tries often being needed to complete the procedure. The access team has promised to make some improvements...


Some access points remain to be checked and tests will be completed later this week


 **Radio protection:** RAMSES detectors, triggering at 0.5 uS/hr have been put in place at the ends of the RF zone. Finally, for UX45 cryo side, a single RAMSES monitor has been installed at the point where the highest radiation is expected. The tunnel roof is completely blocked off, but access to the cryo equipment at the same level remains free (no barriers on the stairways), pending RP measurements during initial RF powering. There is also an interlocked monitor on the RF side of UX45, near PZ45. The RF part of UX45 is a radiation controlled zone and personal dosimeter is needed.

A presentation on RP and access in the RF areas will be made at P4 by Doris Forkel-Wirth on 21st November. Those members of the RF group who have requested the special RF zone access rights will be invited. (There will be separate presentations for other specialist groups)

The additional access protection needed around certain points in UX45 has now been put in place.

2. Equipment status in tunnel (RUX 45)

 **Cryogenics:** Cool-down of sector 4-5 has reached 4.5 K, more or less on schedule. A PVSS application allowing visualization of all settings and readings for the cryo-modules has been provided by the cryogenics applications team. All measurement instrumentation (pressures and temperatures) appears to be working.


 **ACS cavity cool-down:** Module 2 Beam 1 was filled at 16:00 on 20th November; an important milestone has therefore been reached. Vacuum pressure dropped to a good 2E-11. HOM coupler temperatures are also at 4.5 K. The D-Line auto shut off was tested.


However, during the access tests on 16th November a failure in the cryo control system (loss of Ethernet communication between PLC and a front end computer) resulted in blocking of inlet and outlet valves, pressure rise to 1.8 bar, with opening of release valves. This situation should normally have been handled by the warm recovery line, but this was not yet operational due to a problem with control of the heater. The warm recovery line has since been commissioned.

 **ACS Vacuum equipment:**

- Changing of the pneumatic systems on the module sector valves still remains to be done. This needs to be done with the modules cold but empty of liquid.
- The electron stoppers also have to be blocked shut before RF powering.

3. RF Tests on Sector 4-5 ACS modules

 **Low power test:** This can start as soon as the cavities are cold and have stabilized. The four transitions will have to be mounted on the waveguides for one module, then moved to the next.

 **Preparation for RF powering and conditioning:** A number of things need to be done before we can work with RF power applied to the cavities:

- **Check tuner/coupler operation** on all 8 cavities. (Ragnar)
- **Check vacuum gauge signals** are all connected to their correct cavity controller! (Luca)
- **Completion of new crowbar tests:** in order to allow full power. (Olivier, Luca)
- **Calibration of RF forward power signals for conditioning:** with waveguide shorts still in place. Best done at full power if available. (John)
- **Set up of switch and protection module limits:** needs full power into waveguide shorts. (Philippe)
- **Logging of power and vacuum for conditioning:** This is acquired in the front end. Readout and archiving should be operational. (Andy)

The low and high power tests need to be carefully managed to avoid any risk powering when waveguide transitions are being changed. The vacuum work (see above) and completion of access tests also need to be coordinated.

Next Meeting: Wednesday 28th November at 09:00 in the JBA room.

E. Ciapala, 27th November 2007.