LHC RF Meeting

16th October 2008

Participants: Maria Elena Angoletta, John Molendijk, Frode Weierud, Eric Montesinos, Thomas Bohl, Daniel Valuch, Edmond Ciapala, Andy Butterworth, Pierre Maesen, Oliver Brunner, Vittorio Rossi, Luca Arnaudon

1. **LHC commissioning note**
   - First draft by the end of November. Contributions please.

2. **Machine status and planning**
   - **Sector 3-4 repairs:** The interconnects in the damage zone are in the process of being opened. The rest of the sector will be at room temperature in about 10 days. The Short Straight Sections will be taken out through Point 4; the removal of the RUX45 roof will be started today. No intervention is needed to detach anything from the roof (the flexible cryo lines are not attached to the roof when the modules are installed).
   - **Risk to equipment:** K. Foraz is organizing a way to protect the cavities during the transport. 13 SSSs are to be taken out and put back in, which means a total of 26 crane operations above the RF equipment. The UX45 equipment is not too much at risk, since the transport zone is sufficiently large.
   - **Access:** Access to UX45 via the PZ is now normal controlled access; access into the tunnel zone is still restricted.
   - **Water leak:** There has been a large water leak in one HV bunker, with the water level up to the grid. It came from a flexible hose which was apparently not sufficiently tightened.

3. **Cavity tuner repair**
   - The tuning had been recovered by moving end stop microswitch. The module has now been opened and the tuner mechanics dismantled. The problem was found as expected to be a broken cable. The failure is due to a seized retaining dowel which caused the cable to be pulling off-axis at the terminating nipple, which then broke. Clearly this needs a design modification, perhaps to further reduce the size of the dowel to avoid it jamming. Discuss with O. Aberle (Pierre, Olivier).

4. **Vacuum valves:**
   - Discussions have been started with M. Jimenez about installing fast vacuum valves, but AT/VAC are against the installation of fast valves anywhere in the machine.
   - We will need to produce an analysis of what would have happened if the incident had been closer to the cavities, and what measures we can take to mitigate the damage. Letting the cavity beam vacuum up to atmosphere will break the cavity. We should review the results of the Hall 180 test on a LEP module.
   - Cavity spares: The minimum is to construct 4 spare cavities with He tanks.

5. **LLRF**
   - **Radial loop:** The radial loop was ready for testing with beam before 19 Sep.
   - **Phase loop:** components have been ordered for the replacement phase measurement cards. Noise tests done before launching the series.
   - **Frequency protection:** Development is finished, waiting until the software for automatic FPGA reload is operational before deploying the new firmware.
   - **Synchro module:** Firmware is under development for beam rephasing in LHC (adjustment of collision point). The FPGA heating problem is solved.
   - **RF modulator:** Firmware enhancement underway to improve synchronization (D. Van Winkle) for Baseband Network Analyzer operation using the excitation buffers. Both excitation and observation are now synchronized to the 40 MHz beam synchronous clock.
   - **SPS rephasing:** Some modifications are required in the frequency program DSP to be able to run LHC filling and MD cycles at the same time.

6. **ADT**
   - **Filament failures:** The filament problems are under investigation, and are probably linked with a connection soldering problem.
   - **Pt100 probes:** Investigations are underway in the test stand to find where the temperature offset comes from.
   - **Broken loads:** The broken attenuators are of the red Spinner type (HOM A/B, this is an electrode which is capacitively coupled to the kicker). Daniel has placed an order for a different type of load with no mechanical contacts.
   - **Amplifiers and kickers:** All amplifiers have been run up to 17.5kV in the tunnel, showing no arcing in the kickers, so it is deduced that there is no contamination. The amplifiers have now been taken out and moved into the test stand.
   - **DSPU:** The series is expected in few weeks.

7. **SM18**
   - The bunker is still open, and there is no confirmation about cryo before Christmas.
   - Cavity 21 has been dismantled. It will be rinsed and tested in the vertical cryostat. Waiting for transport.
   - For the US-LARP collaboration (D. Van Winkle and C. Rivetta) in November, it will at least be possible to do warm tests into a short circuit.
   - 2 magnets will be tested per week so we should be get some cryo from time to time.
   - It is planned to restarting the vertical cryostats V5 and V4 for ISOLDE and resonators.

8. **APW**
   - **OASIS:** A few points in addition to what was noted in the previous minutes:
     - The maximum number of points for the Acqiris cards needs to be increased to be able to sample a whole turn at 8 GB/s.
     - The software for the “low frequency” National Instruments boards is being deployed.

9. **AOB**
   - **FSU:** the FSU will be reduced by 2 persons: 1 person’s contract ends, 1 will be temporarily moved to magnet repairs. We should start to take LINAC4 work into account in the FSU planning.

A. Butterworth, 20th October 2008