

LHC RF Meeting

13th November 2008

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

1. Machine status

- ✚ **Sector 3-4 repairs:** The roof of RUX45 is off and transport vehicles have been circulating. 2 SSSs were taken out via Point 4 on Monday. The magnets which are thought not to be affected will be taken out first. Estimates are between 1 and 1.5 magnet/day.
- ✚ **Schedule:** Sector 4-5 cool-down starts mid-January, Sector 3-4 in June. The last magnets will be in at the end of April, followed by around 4 months before beam. We should try to get the roof on as soon as possible in order to power the cavities when helium is available. Access to UX45 will probably not be possible during powering tests in Sector 4-5.

2. SM18

- ✚ **Low Level tests** are ongoing with the SLAC US-LARP collaborators.
- ✚ **Cavity 21** is being dismantled. The cavity is polluted with Vacseal after an attempt to seal a vacuum leak in the coupler. This test confirms that Vacseal is not suitable for use on SC cavities.
- ✚ **Tests with new tuning mechanics:** The new mechanics uses a smaller bronze dowel to avoid gripping. It has been tested warm and at liquid nitrogen temperature and found to work correctly. It will take around 35 days to replace these parts in all tuners in LHC.
- ✚ **Cryogenics:** No cryo will be available for RF until next June if there is no change in the current cryo planning.
- ✚ **SM18 helium transfer line** has the same consumption as a full module (8g/minute, giving 16g/min with a module, c.f. 21 g/min for the 6kW cryoplant capacity) so when running we consume almost the full capacity, and therefore cannot run in parallel with the magnet tests. Replacement cost for the transfer line approaches 1 MCHF. It could perhaps be justified by all the SCRF community activities going on, and will be essential in the future if we have to do SPL production tests.
- ✚ **LHC RF tests during shutdown 2008/9:** A complete RF line installation in SM18 is essential for testing, development and training, especially as LHC startup will be difficult since access to the Faraday cages will be restricted. All LL modules and software are as in UX45 but the power system controls are different. We could change the hardware (material cost) or make an adaptation in software to emulate the UX45 situation (manpower). Probably around 50kCHF and 2 man-months for the first option.

3. Spare cavities

- ✚ It will take about 2 years from the time of ordering until we have the cavities, so they should be ordered as soon as possible. We should press for installation of fast vacuum valves for the intervening 2 years as we only have 1 spare module. The subject will be discussed at Chamonix.

4. LLRF

- ✚ **Ongoing developments:** VCXO thermal regulation (Greg) and the frequency program module (Joao)
- ✚ **Tuner:** Jorge is leaving for 6 months, sources etc.
- ✚ **Budget:** The design office costs for the CMM series production was not counted in 2008.
- ✚ **Rephasing on flat top:** The firmware in the Synchro module is done, but needs testing. The Front-end software is not yet started.
- ✚ **Base Band Network Analyser:** The improved synchronisation mechanism being tested in SM18 with the US-LARP collaborators.
- ✚ **VME crate fans:** 12V DC fans will be used for the 25 new LLRF VME crates with fan surveillance via the CMM. These fans are slightly noisier than the previous 230V ones but give 40% more throughput.

- ✚ **Power supplies:** The new model of 3.3V 15A supply is being tested in Greg's system, also in the Beam Control testbench. 30A supplies from same manufacturer are being used in SR4. The old model of 3.3V 15A from CMB are still being used in UX45.

5. Beam observation

- ✚ **Beam quality measurement:** The SPS system can be copied for LHC. Giulia has developed algorithms in MATLAB plus a FESA class, and tests are ongoing to check the response time. Triggering requires a VTU and the associated FESA software which is still being completed by Andrey.

6. AOB

- ✚ **FC temperature trips:** The chilled water was cut, and the note de coupure was received but due to a misunderstanding, no action was taken on our side, causing the temperature trip at 35 degrees. The power was switched back on by TS people. Philippe has now switched off all VME crates, and the main circuit breaker has been left off.
- ✚ **Non-ionising radiation safety system:** This is complete in UX45, with a detector on the main vertical beam of the platform, and warning via flashing lights. We should now look at 112 and SM18.
- ✚ **Frequency ramp test** will be done for the experiments next Thursday.
- ✚ **Commissioning note:** Contributions by end of next week please.

A. Butterworth, 13th November 2008