LHC RF Meeting

16th December 2009

Participants: Philippe Baudrenghien, Wolfgang Weingarten, Luca Arnaudon, Thomas Bohl, Andy Butterworth, Edmond Ciapala, Elena Chapochnikova, Michael Jaussi, Frederic Dubouchet, John Molendijk, Urs Wehrle, Vittorio Rossi, Olivier Brunner, Frode Weierud, Wolfgang Hofle

Main topic: "To do" list of major work items to be undertaken during the technical stop.

1. Cavities/modules

- He spikes and main coupler vacuum activity have been seen when increasing the cavity voltage, which suggests that the low voltage running during beam commissioning has led to de-conditioning.

To do:

- He pressure interlock from the cryogenics system: S. Claudet says the current situation is not safe, as the interlock is transmitted via a PLC. They will give us a direct hardware signal.

2. Power system

To do:

- Improve reliability/noise rejection of crowbar system.
- Circulator control: Currently the loaded Q seen from the klystron changes with power. Investigate and improve the compensation control if possible.
- Klystron collector: open at least one klystron to check the state of the collector. Waiting for official statement on this from the manufacturer.
- Blowers: investigate interlocks and replace complete system in Cavity 6 Beam 2.
- 18kV interlock: The power converter experts have asked TS-EL to provide a safety interlock to prevent switching on of the converter if no 18kV is present.

3. LLRF

- We saw an occasional failure of the Low-Level switch on procedure. It was eventually found that a CIC filter clear is needed in the modulator before tuner locking. This has now been implemented in the procedure.

To do:

- Check phasing of remaining 3 cavities in each beam.
- Look for a new reduced klystron power working point. Power sweep measurements are required, which are normally done into a short circuit. However, the cavities will be cooled down in week 3, so we will not put shorts everywhere just for 1 week. The power sweep can be done into a cold cavity at low Q.
- Hard and soft reboot of Cavity Controllers after every beam dump to clear any possible Single Event Upset errors. It is possible to load some on-board SRAMs with a test pattern for SEU measurement. It should also be possible to upload a firmware check file to each FPGA to detect configuration errors due to SEUs.

4. ADT

To do:

- Interference issues:
  - 1 day will be needed with TS-EL to switch from UPS to normal network to measure 8kHz interference seen on the Low Level amplifiers of the damper. It will also be necessary to switch off the UX45 Faraday Cages as they are on the same UPS.
  - The main source of noise seen earlier in the run was a sigma/delta DAC in the signal chain feeding the BI input. This input can be switched off. BI are designing some improved filtering.
- Two of the ADT pickup cables are bad. These are 140m long, of which a vertical section will probably need to be replaced. Wolfgang will check the cables on 7th January and will make a cabling request. Unfortunately TS-EL are currently overloaded with QPS cables, so the request should be made at the LMC to ensure it is taken into account.

5. Beam Diagnostics

To do:

- OASIS:
  - Export of data to SDDS or other format
  - Acquisition asynchronous with injection
  - Peak detection VME module
  - Integration of National Instruments digitizers for "slow" acquisition
- Repair broken fibre optic receiver.
- Signals to SR4 have ground loop problems.
- Schottky peak detect with BBQ.
- Signal routing from platform to BQM.
- Switching and control HW in SR4.
- Remote control of CCC scopes.

6. Controls

To do:

- Power control front-end computer: there is a serious problem with the FESA processes running in this machine, which seems to come from the CO software infrastructure. CO are already testing offline, and we will start tests on this front-end with them immediately after the machine stop.
- Ergonomics of the RF application:
  - Clarify display of status information, alarms etc.
  - Reliability of updating of the display
  - Fix the alarm diagnostics in FESA
  - Move control of RF FREE to the low level part

7. Planning

- UX45 tentative schedule:
  - 1st and 2nd weeks of January: access in RF zone.
  - Closed from 11th Jan. Access possible with ADI.
  - Week 3: cavities cooled down
  - Week 4: conditioning
  - Ready for LL setting up by end of week 4.
- Water switched off during holidays and put back start Jan. ADT tests will need water in first 2 weeks.
- Tests on circulator can be done in 112.
- Olivier will organise a weekly meeting for work coordination.

A. Butterworth, 4th January 2010