LHC RF Meeting 28th November 2007

Participants: Maria-Elena Angoletta, Luca Arnaudon, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Pierre Maesen, Trevor Linnecar, John Molendijk, Daniel Valuch, Frode Weierud.

1. Equipment status in tunnel (RUX 45)

ACS Low power tests: Tests are practically completed on the four cavities of Module 2 Beam 1. Tuning on two of the cavities (those fitted with compensating springs) was found to have changed. The lower frequencies remained correct, but the upper values were reduced. The range could be recovered to the SM18 final test values by external adjustment of the tuner and limit switches. Further adjustment could have been obtained by adjusting the cables inside the cryostat. The effect is consistent with some loosening of the mechanism, possibly during transport. Occurrence on the two compensated cavities is however to be noted. The number of pulses needed for a given displacement and frequency change can be checked. Q measurements have been done on three cavities and the correct values have been found.

Cryogenics reliability: We have had several incidents of loss of helium through the safety valves. Problems with instrumentation and break in Ethernet communication between the PLC for acquisition pressure, level and temperature measurement and the separate PLC for control of the valves have been blamed. The warm recovery line was installed to handle this type of situation; we will follow up its non-operation with the cryo specialists.

🖶 Vacuum issues:

The electron stoppers have now been blocked shut.

Changing of the pneumatic systems on the module sector valves is planned for this week. This needs to be done with the modules cold but empty of liquid.

A previously unconsidered issue is that the vacuum group requires the sector valves to be closed if the cavities are warm. This is to prevent re-activation of NEG and bake-out which may be necessary if gas in the large cavity volume, with a vacuum pressure of the order of 10E-9, is transferred to the neighbouring equipment under a pressure of 10E-11. Of particular concern would be the APWL, where we want to avoid bake-out and risk of damage to feedthroughs. The precautions to follow and the highest tolerable vacuum pressure in the cavities with the valves open needs be settled urgently with the vacuum group. We should also agree with the vacuum group on the dose rates allowed, and consequently the field levels which can be applied, with the sector valves closed. (We however expect that keeping valves closed should be acceptable for conditioning as far as to nominal field)

2. ACS RF Power systems:

Crowbar trigger: The new triggers have been installed and tested in the two bunkers for the **.** sector 4-5 modules.

Power converters: We have now had 56kV and 30 A on both power converters. PO group are doing measurements.

3. ACS High power commissioning work:

ACS Interlock tests: Final tests will be done once the missing waveguide sections are back in place and waveguide shorts are out. The interlock test procedure has been compiled and completed checklist files will be put in EDMS. See examples in DFS at this link

Calibration of Forward power for conditioning: is now done for four cavities (with power 4 levels around 150 kW into waveguide short). The work has been interrupted by a problem with operation of the local conditioning DDS, now under investigation. (John)

Vacuum gauges: The minimum vacuum readout on the power coupler is 10E-9, compared to the 10E-11 in SM18. Hence different calibration curves are needed. This has to be remembered in the front end computer.

FESA deployment: The FESA classes for one cavity (C5.B1) have been fully installed. Some work has to be done to handle the switch and protection module (persistent data to be reloaded on reboot).

Logging for conditioning: Data is stored in the front end. (vacuum pressure and pulse synchronized RF power). This needs to be transferred periodically to the logging system. The necessary software is being put in place.

Conditioning procedures: Eric is preparing a checklist and procedures.

4. Short term planning:

Low power test: M1.B2, finish forward power calibrations for conditioning. Earliest closing of zone for power tests Friday p,m. We will then proceed carefully with conditioning of a first cavity (using and verifying the checklist) while power tests are being completed on other lines.

Next Meeting: Thursday 6th December at 08:45 in the JBA room.

E. Ciapala, 28th November 2007.