

LHC RF Meeting 16th January 2004

Present: Luca Arnaudon, Philippe Baudrenghien, Andy Butterworth, Olivier Brunner, Edmond Ciapala, Wolfgang Höfle, Roberto Losito, Trevor Linnecar, Joachim Tückmantel, Volker Rödel, Daniel Valuch.

Excused/Absent: Thomas Bohl, Elena Chapochnikova, Eric Montesinos.

1) UX45 Layout (Volker)

- The draft ECR for the new layout has been circulated inside the group by Volker. We estimate a factor of 30 improvement (rather than 10) in single event susceptibility compared to that with the old layout. The installation team objects to concrete blocks in front of the Faraday cages being in the transport zone. Since these blocks are a reserve in case of future problems we now decide to keep the LLRF racks in line with the TX passage as originally drawn and not include the blocks in the present proposal. Andy's report on radiation studies is nearly complete. It will go into EDMS and the number will be referred to in the ECR.

(Actions: Andy, Volker)

- Now that layout is decided the cabling lists must be finished. The 'Demande d'Installation des Cables' DIC has been compiled, in a first version, by J-C Perrier for the old layout. This must now be corrected as needed, checked and completed by each equipment specialist, as far as possible, before it goes back to Jean-Claude and Volker for final checking.

(Action: Luca, Wolfgang, Philippe, Olivier)

2) LHC Access (All)

A meeting was held with OP, BI, VA and LHC access system specialists, to identify RF & BI needs in the IR4 RF beam zone. A summary will be circulated. Briefly, there is one zone, comprised of RA43, RB44, RUX45, RB46 and RA47. We have agreed that HV power converters for all systems ACS, ACN and ADT will be inhibited via a single loop while the RF zone is in test mode. There are some other points to be decided:

- Position of doors in the RAs limiting the RF zone
- Position of radiation stoppers (modified sector valves)
- Special conditions and procedures for He processing. (We must keep this option open)

3) Power Couplers (Ed on info from Eric)

- **Polarization Ceramics:** Work is ongoing on the second polarization ceramics with Serge Mathot and Jacques Genest (TS). This includes simulations to understand recent experience, such as the fact that leaks appear only after bakeout. Special tools and procedures for assembly will now be used. Five ceramics will be ready in the coming week, allowing us to maintain the schedule for coupler production.

- **SA2:** Power cuts have lead to broken water pump and no operation since Monday 12th January. However, the two couplers are now at 450kW with 1ms/10ms pulsing and should soon go to continuous power conditioning.

4) Safety Valves for ACS helium (Roberto)

- The proposed valve is being checked by TIS. The question of safety in the event of blow-out into the tunnel is also being looked at.

5) ADT (Wolfgang)

- **Anode power converter:** The tender offers are now being studied.
- **Ug1 Ug2 Supplies:** Wolfgang and Frode will visit the suppliers this month.
- **Driver amplifiers:** A prototype will be tested in mid-February. RF performance of the part of the amplifier completed so far is good.
- **Rhenium coating** of the ceramic mounting supports for the kicker electrodes still has to be tested by the vacuum group.

- **Material for Amplifiers and Kickers** has been sent to Dubna
- **Heater Supplies:** Maintaining correct heater voltage may be a problem due to the long cable lengths. Cables may need to be doubled to minimize voltage drop (as done in SPS) or some regulation system could be implemented. A regulator like that used for the klystron heaters might be suitable and this should be looked at. **(Action: Wolfgang, Luca, Olivier)**

6) SM18 (Roberto)

- Restart of the helium plant is delayed until 26th January.

7) Budget & EVM (Trevor)

- We should check our expected expenditure for the year. The DPO **MUST** be informed of any important changes with respect to EVM.
- There is a now small budget allocation for the operation of installations before LHC start up.

8) RF components for treatment of ACS HOM signals (Daniel)

- The directional coupler and filter for HOM fundamental power have been measured. Due to the use of two stripline filters, one at 420 MHz and the other at 840 MHz, the frequency characteristic shows sharp cut-off above 420 MHz and good rejection of the HOM frequencies.

9) Klystron & LLRF loop performance (Trevor & Philippe)

- A 'Moderator' will be used in the LLRF system to modulate the requested power for individual bunches and limit transients.
- The performance of the klystron (amplitude & phase) under high power pulsing, as in machine conditions, should be studied and measured under various operating conditions. This could be done in Hall 112. Long term reliability tests of the whole system under high power pulsing conditions should also be done.

10) Dust Traps (Joachim)

- A design has now been produced. It consists of a short chamber with electrodes above and below the beam. The field is of the order of 50 kV/m. Four will be needed, one per ACS module. The design resembles the ADT kicker tanks, suggesting the possibility of using common parts. Issues such as removal of dust particles, reliability of HV supply, positioning, access conditions still need to be studied.

Next Meeting:

Friday 23rd January 2004 at 08:45 to 10:30 latest in Salle J. B. Adams (864-2-B14)

E. Ciapala, 19th January 2004.