

LHC RF Meeting

24th November 2006

Participants: Luca Arnaudon, Philippe Baudrenghien, Thomas Bohl, Olivier Brunner, Edmond Ciapala, Wolfgang Höfle, Trevor Linnecar, Pierre Maesen, Eric Montesinos, Daniel Valuch.

1. ACS Couplers and SM18

- ✚ **Couplers 131 and 134:** These have been successfully baked.
- ✚ **Couplers 132 and 133:** Conditioning is progressing normally in SA2, and expected to be completed in mid-December. We would like to do the coupler change over immediately afterwards, i.e. this year - but this depends on vacuum support and SPS shutdown work.
- ✚ **Single cavity module LHC21:** Now in the bunker and cooled down. The 400 MHz klystron needs to be re-connected to the bunker and everything on the power and control side checked out. Conditioning will start next week with the original system, before testing with the new systems – see below.
- ✚ **New conditioning and electronics:** As well as the new conditioning system, the final version tuner and coupler controls will be installed, to allow the full LHC system to be tested out. All new equipment can then remain in place and be used for conditioning of Module 4 (Europa), planned early next year.

2. UX45/RUX45 installation (Olivier)

- ✚ **Klystrons and equipment:** The last klystron is now being put in place and aligned. Final modifications are also being completed on the last group of five klystrons.
- ✚ **HV Bunkers and HV equipment:** Crowbar tests with the HV generator are continuing and should be complete by the end of the year. Controls equipment in three bunkers has now been fully tested (Luca).
- ✚ **Klystron controls racks (Luca):** 13 klystrons and circulators have now been fully connected to their controls racks. Interlocks will be checked next. Here we are training two separate two-man teams.
- ✚ **Module interface testing:** Tests on temperature measurement are ongoing. Values are read on the PLCs and displayed on the PC with a Labview application.
- ✚ **Water cooling:** We need to test the water systems before the end of the year to avoid the risk of being blocked by power limitations in January and P4 water stoppage in February. We have to verify that the 9 bar pressure of the common UX45/RUX45 water pump is sufficient to provide the required flow for all klystrons and circulators. Before water circulates a pressure test - up to 24 bar - is essential and top priority; this is planned for next week.
- ✚ **FSU work planning:** This needs to be done in view not only of the large amount of work, but also the need to make best use of and maintain our trained and competent FSU staff. Olivier will prepare a list of jobs and rough planning for power and installation work next week. A similar exercise is needed for LLRF and electronics work. We may need to obtain additional suitably qualified FSU staff to handle testing of series LLRF modules. (See below under LLRF) **(Action: Olivier)**
- ✚ **Emergency stops:** The situation regarding local emergency stop buttons and UPS supply remains to be checked. Generally, safety considerations would take priority over machine operation and UPS should cut with the electrical distribution safety buttons. Additionally our UPS are not used for essential safety functions, as is perhaps the more general rule. **(Action: Olivier & TS-EL)**

(Post meeting from G. Roy: The general policy is to include UPS in local emergency stops, but not in the general emergency stop)

✚ **RF cables and connectors:** J-C Perrier has tested a number of coax cables and a few more serious defects have been noted. Additionally some 3/8 inch Flexwell cables have been found damaged (Eric). Since the various cables have different lengths, sections and functions it is difficult to define a comprehensive standard test and measurement procedure for all cables. The equipment responsible will need to define this for their individual systems. J-C Perrier can provide the list of cables and can participate in the tests. Cutting of cables needing equal lengths for ADT and LLRF has been done.

A meeting will be held later in the day to discuss remaining cabling issues with TS-EL (ACS antenna, HOM, certain controls cables & connectors, testing, etc.) and agree on responsibilities for the completion of the work.

✚ **Network Situation (Luca):** We are waiting for the optical fibres for the network to be blown. FIP fibres for the function generators are however now in place.

✚ **Electrical Distribution Boxes for ADT:** The blue distribution boxes, one on each side of RUX45 will need to be modified – for removal of circuit breakers since we have our own in the ADT amplifiers. This is being discussed with TS-EL. It however means that the boxes can only be finally put in place after all the vacuum equipment is in place and some form of ladder or platform will be needed for access and protection of equipment.

✚ **ADT racks:** While everything is in place for the ADT control system there are a number of spaces in the racks for other ADT equipment – signal distribution, fast acquisition and diagnostics remain to be fully defined and a “DIC” cable list made. This needs to be complete in order to decide if we need TS-EL support.

3. ADT (Eric/Wolfgang)

✚ **Amplifiers:** The partially completed amplifiers should arrive very shortly from Dubna. The Dubna team will come at the same time to finish construction. There may be some delay in the supply of the resistors and these may have to be retrofitted after assembly, probably in January.

✚ **Signal distribution for ADT:** The basic layout has been defined but a detailed drawing, similar to that done by Daniel for ACS, has still to be done - covering both UX45 and SR4 equipment
(Action: Wolfgang, Daniel)

4. SR4

✚ **Control Area Enclosure:** Will be put in place by the supplier the week after next. Clearing up the area has started and missing floorboards are now 90 % installed. More are being ordered.

✚ **Racks and cabling:** A number of details concerning some of the equipment in the racks have still to be defined (positions, panel layouts, connector types etc.). Again this information needs to be completed urgently, the “DIC” list for the cabling completed, then any required TS-EL support organized. Systems needing final definition are ACS LLRF, ADT Loops and Controls.

5. LLRF (Philippe)

✚ **Cavity Controller Crates:** Production of the crates has started, using local FSU staff. We expect to manage 10 crates before the end of the year for SM18 and lab use, then complete 32 more towards the end of January to equip the UX45 Faraday cages. An extra mechanic has been taken on in the FSU to help with this work.

✚ **Electronics Modules:** Philippe will present a detailed review of the status next meeting.

6. AoB

✚ **Electronics Tools Support:** Was discussed at the ABMB. All groups agree on the importance of this and the idea of making it part of TS division is supported.

✚ **Budget:** Our spending is generally following the profile planned last March. However Code 95540 (IES spares) appears to very much under-spent and will be checked.

(Action: Ed.)

Next Meeting: Friday 1st December at 08:45 in the JBA room.

Some topics:

- 1) FSU manpower and planning.
- 2) LLRF modules status review (Philippe)

E. Ciapala, 28th November 2006.