

# LHC RF Meeting

24<sup>th</sup> March 2006

**Participants:** Luca Arnaudon, Thomas Bohl, Olivier Brunner, Edmond Ciapala, Pierre Maesen, Eric Montesinos, Joachim Tückmantel, Daniel Valuch.

## 1. Couplers (Eric)

🔧 **SA2 conditioning:** Conditioning of couplers MC128/129 in SA2 is now at 150 kW with 2ms pulsing. Conditioning with continuous power will start next week.

## 2. ACS Modules and SM18 (Pierre)

🔧 **Modules 3 and 5:** Module 3 has been taken out of the bunker; module 5 has been installed and is now being connected. (cryo lines, cables, waveguides, stoppers etc.) Cool-down is planned for week 14.

🔧 **Safety valves:** G. Mouron will help with the design of the double valve connections.

🔧 **Rupture discs:** We have all parts needed in stock.

🔧 **Alignment:** L. Sandri (TS-SU) is assisting with the design of the alignment target.

🔧 **Tuner bellows:** The second prototype is being welded to the supports. We will order eight of these bellows straight away in order to gain time. These will be fitted to the eight sets of supports recently received from the central workshop.

## 3. ACS Power (Olivier)

🔧 **Circulators and loads:** Long term supply of spares is being discussed with the supplier.

🔧 **TCU (Temperature Control Unit) for circulators:** The new PLC based prototype is being prepared by D. Glenat, together with Luca.

## 4. ADT (Eric)

🔧 **Kicker assembly:** Following successful completion of the 18 kickers last week by Dubna, we are now waiting for bake-out of the first batch of 10 - hopefully this will start next week.

## 5. APW (Thomas)

🔧 **Feedthroughs:** We are still waiting for the final report from S. Sgobba (TS/MME) on the leaking of the feedthroughs after bakeout.

## 6. Controls & electronics: (Luca)

🔧 **ACS system - Lab tests:** The local switch on procedure has been tested and the PLC code finalised, with the exception of some specific details due the restrictions of the test system. The full interlock chain has also been tested, including check of long cables between crates and IO. The next step will be to integrate FESA 2 and implement remote control via the front-end computer.

🔧 **ADT controls:** Roughly half of the hardware has been delivered. The remaining part will come in a week's time. The interlock crates will be ordered now. Tests will be done in B867.

🔧 **ACS Power Converter controls.** The hardware for these ex-LEP converters will remain unchanged; however the 6U control chassis of the LEP era will be replaced by the new LHC standard.

🔧 **IT infrastructure:** Costs for all equipment and cabling are fully covered by IT department.

## 7. UX45 installation progress (Olivier) [See photo UX45](#)

🔧 **Shielding wall:** Installation of blocks around the cryo passages in the outer shielding wall is practically complete. However the blocks that have been used are normal construction blocks (made from aggregate material?) they also have holes (!) and are consequently much less dense than proper radiation shielding blocks. This is being discussed between TS-CE and SC-RP.

There is still some scaffolding around one of the vertical cryo lines between the walls, otherwise work in this area on the cryo lines is complete.

🔧 **RUX45 roof blocks:** New blocks will have to be obtained; the originals have been used for another purpose. The new blocks will not be ready till mid-May. With eight weeks needed to install the ventilation units and four weeks for the cryo line, the installation of the ACS modules would be delayed. We therefore need earlier delivery of the roof blocks, i.e. early May.

🔧 **Cabling:** Cable tray routing between the walls has been finalized in two meetings this week. Once cable trays are in place installation of cables from the tunnel to the racks and the Faraday cages can start. There around 380 cables to be pulled. Routing in the vertical trays at the centre of both sides of the cavern is the most difficult. Control cables from SR4 are being pulled at the moment.

🔧 **Positioning of tuner reference couplers and cabling (Daniel):** Cable lengths need to be known for calibration of the directional couplers. The positions of forward power couplers on the waveguide and final routing of cables needs to be finalized. Positioning the forward power coupler nearer the circulator makes cabling to the Faraday cage shorter and easier. However, following the antenna cable routing for these signals is preferable to minimize phase errors. Routing long distances along the waveguides is inconvenient and would need extra connectors. We should put the directional couplers at the nearest reasonable point to the cavity, then route the cables with the antenna cables. Putting directional couplers close to the cavity also minimizes effects of waveguide expansion.

🔧 **Cryo connection (Pierre):** Routing of the cryo lines to the modules is presently being verified with Air Liquide, cross-checking the SM18 bunker layout. This has revealed a problem with routing of the flexible input/output lines for the outer modules, i.e. those extending into the RBs where the roof height is very restricted. With the present design there is interference with the power couplers. This can be corrected by changing the angle of the connecting pipe coming out of the roof cryo line and passing the flexibles round the waveguide side of the coupler, rather than over the top. This will have to be checked with existing drawings and with the integration team. The area is extremely tight, with cable trays on the roof.

🔧 **Ventilation units:** Ducts have been installed on top of the Faraday cages.

## 8. SR4

🔧 **Racks:** Some racks still have old equipment and this will have to be removed.

🔧 **ADT supplies:** All eight are securely in place.

🔧 **False floors:** A number of floor panels are missing. These will be put in place once the cabling work is completed. We have sufficient panels.


## 9. Vacuum layout (Olivier)


Olivier has compiled the layout list for RF equipment in IP4.

See [IP4EquipmentPositions.pdf](#)

This is based on the full layout list by M. Jimenez, the latest version of this available via the following link: [http://layout.web.cern.ch/layout/vac\\_vaclayouts.aspx](http://layout.web.cern.ch/layout/vac_vaclayouts.aspx) => options LSS4 / Study in design. (**NOTE** this is still considered as an unofficial layout – the official layout on the normal LHC web page does not contain RF).

## 10. AoB

 **LSS review (Olivier)** this will be held on 29<sup>th</sup> March, with installation specialists, vacuum group and representatives of all AB department equipment groups. Our standpoint is as summarised in the meeting [LHC RF 10th March](#); i.e. all RF equipment will be ready, it must be installed straight away for commissioning and bake-out in LSS4 is essential. Olivier will present a slide showing each main system and the status: ACS, APW and ADT. Slides for the last two are requested, e.g. photos of assembled equipment. **(Action: Eric/Wolfgang)**

 **RF patch cables (Daniel)** Around 450 various length patch cables, equipped with connectors are needed. These will be ordered directly from the manufacturer for cost reasons. (€12 each)

**Next Meeting:** Friday 31<sup>st</sup> March at 08:45 in the JBA room.

E. Ciapala, 27<sup>th</sup> March 2006.