LHC RF Meeting
3rd June 2005

Present: Luca Arnaudon, Thomas Bohl, Olivier Brunner, Andy Butterworth, Edmond Ciapala, Wolfgang Höfle, Trevor Linnecar, Eric Montesinos, Joachim Tückmantel, Daniel Valuch, Frode Weierud.

1. Corrections to Write-up of meeting 27th May 2005

- **Section 1. - UX45 Installation:** ADT piquage – actual connection still to do (See 2 below)
- **Section 2. – ACS Couplers:** The two coupler assemblies are not yet completed in central workshops (see 4 below)

2. UX45 Installation (Olivier)

CE Progress: The second bunker walls have been completed. The roofs can only be done partially just now as some roof blocks will not be delivered until July. The waveguide holes were checked before drilling. During this check an error was found in layout drawing LHCLJ4GA0007; the side view of the cavities showed beam 2 modules turned in the opposite direction. This is being corrected. The platform, which was planned to be completed by now, is delayed due to some missing parts. The passerelles above the Faraday cages (to allow access to the patch panels on the top of the cages) will be installed on 10th June.

Water cooling: The four connection points (piquages) for the ADT supply in RB44 and RB46 have been defined; the layout can be finalized. Water pipes in UX45 for the klystrons have been prepared and are ready for installation; those descending from RUX 45 will be installed next week.

Faraday cages: There will be a meeting with supplier on June 10th. Before this meeting we must know:

1) The exact outside dimensions to specify, based on measurements of the space available between bunkers and transport area in UX45, allowing space for bending of flexwell cables.

2) The distance available for the door opening, between the bunker and the end of the cage.

3) The positions of the patch panels on the roof (2 per cage), such that there is the best fit with the cable trays and passerelles.

For points 1) and 2) the measurements have been done. For point 3) there will be limited accessibility around the connectors (size and number of cables), we may need to further split the patch panels (e.g. no more than two or three rows of connectors)

Cable trays and DiC: A first layout of the cable trays in UX45 has been completed. Cross section drawings of various cable trays have been made, showing the arrangement of the different cable types. These are available in the infrastructure folder of the AB RF LHC server. There is relatively little mixing of cable types on the same trays and where this is inevitable they are well separated. Areas where cable routing is tight are the holes in the quay and past the space between the Beam 1 ACS cavities and the wall. The latter is a concern for the routing of the 1⅝ inch cable from the APW to the racks on the cryo side of UX45. The possibility of putting the APW racks in U&L44 and UL46 was looked at. It has the advantage of allowing shorter cable length but would need two groups of racks and additional equipment. The preferred solution is to remain in UX45 cryo side.

Installation of flexwell cables: This will be a delicate operation, particularly for ⅜ inch cables (e.g. for ADT) which can easily be damaged. There will need to be close supervision at the moment of installation of all flexwell cables.

Flooring: Material (aluminium grilling) for false floor for the HV bunkers has stolen from its storage area and will have to be re-ordered.

SR4 floor reinforcement: A new design has been done.

3. Integration (Olivier)

A meeting with the integration team was held this week:

- **ACS cavities and Cryo:** The layout for the warm recovery line is needed. Also updated 3-D simplified maquette drawings of the cavities. These will need to be updated with the warm recovery line connections and new safety dome design. **(Action: Ed & Pierre with draftsman)**
- **Transfer of drawings to Autocad for installation work:** The Euclid drawings of the integration team will be transferred to Autocad 3-D by S. Girod, from which the required 2-D drawings, e.g. for cable trays, will be made.
- **ADT Layout:** The information on recently modified arrangement of kicker modules on the LHS of IR4, now correct in layout diagram LHCLJ4GA0007, had not been included in the integration drawings. This still has to be done.

4. ACS Couplers (Eric)

- **Coupler production:** Mechanical parts (λ/4 line and body assembly) for the next two couplers could not been completed due to problems with the electron beam welding installation in the central workshops. The repair of the installation should be done next week and the TS-MME workshop will prepare an additional four coupler assemblies at the same time.
- **Polarization ceramics:** We have 24 polarization ceramics and all are good.

5. ACS Modules

- **Conditioning in SM18:** Cavity B of module 2 is progressing well. For this cavity the conditioning process was started with the coupler out (0 mm, min coupling) with up to 120 kW pulsed. 8 MV/m was quickly obtained in the cavity.
- **Installation deadlines:** The latest SM18 planning indicates that we will not have four modules ready for the tunnel before April 2005. Our general deadline for installation, set mainly by vacuum activities after installation, is end 2005. The deadline for the ACS cavities is decided by the QRL and by the need to keep the roof on UX45 completely open to allow installation transport. The planning for cryo and transport should be checked with the groups concerned. **(Action: Ed. & Olivier)**

(Much of the extra delay in completing the modules is due to the cryo and tuning modifications, which we could dispense with at the limit but with the risk of difficulties later on …)

6. ADT (Wolfgang)

- **Anode supply:** The supply has now been delivered in B867. The lifting support provided is hopelessly unsuitable; this will be taken up with the manufacturer.
- **Dubna:** There will be a visit next week. In the meantime we have no further news on the amplifier plus electrodes shipment.
- **Kicker tanks:** Four have been received in Dubna, two are good but the other two have a suspected vacuum problem, possibly related to the flanges.
- **Drive amplifiers:** An inversion in the specified logic for the fault signals has been found. This is being discussed with Thales.
- **HV Resistors for Amplifiers:** One water-cooled HV resistor has been received. They (four per amplifier) will be fitted to the amplifiers after delivery from Dubna. This provides a good opportunity to do HV and power tests before the series is delivered. **(Action: Wolfgang)**

7. B867 test stand (Eric)

- **Status:** The anode power converter is in place. Cabling in the racks is being completed. Tests on the controls interface of the converter will be done first. A load from BA2 will be installed, allowing power test up to 160 kW.

8. APW (Thomas/Eric)

- **The prototype tank and coaxial line** have been completed and assembled. Response measurements will first be done without ferrites. The ferrites are being prepared; rectangular ones are cut with high pressure water, the others by conventional methods. There has been a certain loss in expertise in the workshops in handling this type of job. For the series production, when exact dimensions have been decided, we may anyway go to outside production.

9. Software (Andy/Frode)

- **Drivers and basic applications:** Basic facilities and drivers have been developed for the LLRF modules soon to be tested in SM18, i.e. for tuner control, feedback and clock modules. We have good support from the FESA 2 software team of AB-CO, the main problem at this early stage being the lack of documentation.

10. ACS controls (Luca/Andy)

- **LF Diagnostics cabling layout:** This will be completed when the present ADT work in B867 is finished. There are roughly 60 signals per ring, mainly detectors, directional couplers etc. The patch panels also need to be laid out and named.

Next Meeting: Friday 10th June at 08:45 in the JBA Room 864-2-B14.

E. Ciapala, 3rd June 2005.