LHC RF Meeting

5th April 2007

Participants: Maria Elena Angoletta, Luca Arnaudon, Philippe Baudrenghien, Olivier Brunner, Thomas Bohl, Edmond Ciapala, Pierre Maesen, Eric Montesinos, John Molendijk, Joachim Tückmantel.

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1. P4 installation/commissioning

- **UX45/RUX Activities** – ongoing and pending items:

- **Water:** Water was started on the 29th of March. The RB46 side could not be used as an inversion between inlet and outlet had not been corrected on that side. It will be modified next week. In UX45 the supply was switched on to all klystrons, one by one by one. A number of minor leaks had to be repaired, e.g. gaskets on flow meters. One water load cooling pipe needs soldering. One klystron has a flow limitation in the body circuit, (known problem). We will try get round this by slightly increasing pressure. In the HV bunkers flow rates are too near the lower measuring limit for the standard flow meters used. They will be modified and readjusted.

  For the ADT in RB44 the cooling system proper has been tested with the amplifiers by-passed.

  The water will be switched off over the Easter weekend and probably the following week. The RB46 inlet/outlet crossover will be done during that week.

- **ACS tests:** By the time water is back the klystron power converters will have been modified to provide the full current for four klystrons. In week 11 tests will start on switching on of heaters and focus supplies.

- **Cryo:** We are preparing for the pressure test.

- **Vacuum:** Installation of chambers appears practically complete, but a number of bellows still have to be put in place. NEG activation for the ACS module second beam tubes is planned for week 18.

- **HOM cables and trays:** The design layout has been completed by Daniel. Cable trays on the platform will be fitted in the next week or two.

- **SR4:**

- **SR4 cooling and ventilation units:** *(Copied from 2 previous weeks)* Still waiting on news from TS-CV. *To check with J-C Perrier.*

2. ACS Modules, Couplers and SM18

- **He tank pressures & safety valves:** Following reactions during the ICC of last week on the new (assumed agreed) safety valve settings made in Olivier's RF presentation, a meeting was held with AT-CR (L. Serio) and SC (B. Delille).

  Operation at 1.6 bar release pressure for the He tank valves has not been formally approved by AT-CR. They maintain that operation will be very difficult due to the resulting small operating margins and that release of He will be frequent. (itself a safety issue) However, SC are unable to find technical justification to increase this level. Note that this value is that calculated to "assure good functional reliability" of the tanks, throughout their lifetime. (STIS report ref no. TIS/TE/MC/1-2255) This report also points out that safety risks due to breaking of the He tank are minimum, due to the protection from the cryostat. L. Serio has agreed to confirm that this is the case.

  With rupture discs (RDs) and safety valves (SVs) dimensioned as proposed (SVs D25mm and RDs D80mm), mounted on all four domes, we are well protected for insulation vacuum loss and C line overpressure. Any pressure differences are determined by the 50 mm diameter of the piping inside the module.

- **Single cavity:** The location of the leak has been confirmed as near the second polarization seal. A 'VacSeal' compound has been carefully injected around this area, and this appears to have sealed the leak. The product can withstand temperatures of up to 400 °C.

3. H112 test stand:

- **Startup:** Installation of controls and other equipment is complete. The power converter will be tested first. Tests will start as soon as can be managed.

4. Klystrons:

- **Thales:** First tests on the collector cooling have been be done by Thales. Rotation of the water inlet to a new position with respect to the collector results in a new hot spot on the collector, at the same relative position, opposite the inlet, this being visible after only a few days running.

5. LLRF:

- **Polar Loop and Modulator:** Modulator tests are ongoing. The complete feedback chain is being tested in the lab crate. For the moment a problem of additional modulation at the modulator output is being looked at, suspected to be due to offset bias on the I & Q signals from the feedback modules.
- **Series Production of modules:** Around 100 VME modules are being assembled. This does not include the feedback modules which will be launched soon. We believe we have sufficient manpower to manage the testing.
- **Damper electronics:** The power protection interlock electronics have been configured.

6. MTF for Hardware Commissioning (Blanca Perea Solano)

- **Overview:** Blanca gave an overview of the structure in MTF and showed some examples. Note that the structure is based on the equipment 'slots' in the machine, this being relevant for sequential hardware commissioning around the machine. Note that the equipment MTF is another structure containing the data on the individual equipment items themselves, organized not by slots but by type and serial number. The HWC MTF can give the identification of the equipment installed in the given slots and provide a link to its MTF. An interesting feature is that report pages can be generated, showing overall status of the different tests.
- **RF implementation:** So far the only RF equipments entered are the ACS modules, as the only equipment so far identified in MTF (Pierre). Since much of our testing is also based on 'lines' or individual cavities, klystrons and related feedback loops we will add this level into the structure.
- **Definition of the tests and follow-up:** The basic tests to be done on the equipment remain as specified some time ago (Excel File) and these have been entered for ACS by Blanca. She will complete the top structure and include the equipment in the navigator. Access rights for updating have also to be assigned, for the moment write access will be given to the persons listed as responsible for the various tasks in the Excel file.
- **Equipment MTF:** We will look into completing this for all the major pieces of equipment. For most electronic crates we will only do the break-down to the crate level, but for some systems it will be useful to go down to the module level. (e.g. VME LLRF crates)

Next Meeting: Thursday 19th April at 08:45 in the JBA room.

E. Ciapala, 18th April 2007.