

Minutes BWS Upgrade: Electro-Mechanical Design Meeting #10 -- 21th April 2016 --

Participants: Raymond Veness, Bernd Dehning, Federico Roncarolo, Jonathan Emery, William Andrezza, Dmitri Gudkov, Jose Luis Sirvent

Agenda (<https://indico.cern.ch/event/522821/>)

PDF Version Bernds_Notes

1. Communications

- **Review last meeting (17/03):**
 - ◆ Jonathan presented the electronics status and the schedule for next year.
 - ◆ Ray show a general presentation on the PSB scanner. 6 weeks scheduled BWS testing (Vacuum, RF...)
- **Follow Up meeting (22/03):**
 - ◆ Motor controller and "Intelligent Drive prototype" physically shown.
 - ◆ Some investigations are required to check in which direction to go with "Intelligent drive".
 - ◆ Decision to take on:
 - ◇ Usage and adaptation of VFC board for this purpose
 - ◇ Design of a custom and project specific board.
 - ◇ Report on brief summary to help in decision.
- **News:**
 - ◆ Cost estimate for all production, installation and all equipment required.
 - ◆ ML will present in August.
 - ◆ PS installation to be done in 2017/18, cell 54.

2. Open Actions Check-list (B.Dehning)

- **Feedthrough for RF antenna: (DONE)**
 - ◆ Offer received and in contact with company that will provide Feedthrough (Dmitry)
 - ◆ Discussion with Fritz, and feedthrough accepted. (Dmitry)
 - ◆ This feedthrough comes from a request from a RF Meeting 6 monts ago (Raymond)
 - ◆ RF simulations are not foreseen, in some cases are not as reliable as spected (Raymond)
 - ◆ Reason: This antenna will rick-up RF to avoid wire breackage due to RF heating.
 - ◆ Is there any measurement on the wire heating for the new BWS in parking position? (Federico)
 - ◇ There is a measurement of the current induced on the wire due to the beam crossing. (Jonathan)
 - ◇ Also the wire resistivity is measured.(Jonathan)
 - ◇ However these measurements are triggered by a movement(Jonathan)
 - ◇ There is no gating on the system measurements since there is memory enough, our dedicated system could allow us to add some more functionalities.
- **Viewport Drawing Check: (DONE)**
 - ◆ Drawing is finally OK.
 - ◆ Nicolas assured that to be mounted on this configuration is not a problem.
- **ECR for PSB (Ongoing):**
 - ◆ Discussed with vacuum group.
 - ◆ Preliminary designs approved.
 - ◆ Discussion on SEM grid placement and why usage of the same ring (#3) for both equipments (Federico):
 - ◇ BWS placed upstreams SEM grid.
 - ◇ Intervention splitted on 3 phases (William)
 - ◇ The idea is to touch always same pipe (William)

- ◇ Remark on spacing for Scintillator system (Needed to foresee space for this)
- ◇ If SEM grid and BWS are swamped maybe there'd be more space for Scintillators.

- **Wire fixation on fork (Defined):**

- ◆ Fixation system defined and presented on BI day by Dmitry (see here [☞](#))

- **Needed to check AL reflectivity loss with time, oxidation (still unclear)**

- **Motors testing (Ongoing):**

- ◆ Aim: Confirm specifications and check if they still fit for our system with the custom rotor.
- ◆ Started some preliminary testing.
- ◆ Some tuning required on the controller system.
- ◆ New rotors will be ready May-June.
- ◆ Jonathan requires to work 100% on this during at least 1 day.

- **Disk vibrations simulations (To be done)**

3. Mechanics: Status Update (D.Gudkov)

- **Vacuum Compatible Rotor (Alxion) tests:**

- ◆ Bake-out at 235degrees.
- ◆ Outgassing is OK.

- **Motor orders:**

- ◆ 3 Vac. Compatible motors ordered and waiting for approval.

- **Metallic encoder disks samples:**

- ◆ Two samples ordered
- ◆ Surface diamond machined
- ◆ Two possible laser engraving (Lasertec and Dundee Univeristy)
- ◆ Dundee University sample available next week.
- ◆ Jose will test both samples same day (next week).

- **Real size encoder disk:**

- ◆ Tooling for testing it on test-bench is being produced.
- ◆ Production in end of May.
- ◆ Material received in April.

- **Production status:**

- ◆ Production started: 3 machines + 2 tanks.
- ◆ Drawings approved and cost estimate 75 kCHF (not including raw materials)
- ◆ Big viewport included for inspection.
- ◆ PSB mounting tooling almost done.
- ◆ Support "table" for PSB prototype already prepared.
- ◆ Mock-up model will be built on laboratory for mountint/dismountint training.

- **Special pieces for motor / resolver and encoder systems needed to be ready on August (Place orders ASAP!!)**

- ◆ Foresee orders for 3 PSB machines

- **Integration Study:**

- ◆ Nicolas Chritin will be involved on this for PS and SPS.
- ◆ Required BC for starting the job
- ◆ Good to start with PS (Raymond)

4. AOB

- **Calibration Benches**

- ◆ Aurelie will be strongly involved on the Optics review and re-design if required.
- ◆ Calibration benches needed:
 - ◇ Calibration bench #1 SPS proto:
 - To be placed on 867, mounted on SPS BWS. Mechanics already on the lab.
 - Operational calibrations
 - ◇ Calibration bench #2 SPS Squared frame:

- To be placed on 865 Laboratory, mounted on table with some reference point with respect to squared frame.
- Gain experience and testing purposes
- ◇ Calibration bench #3 PSB proto:
 - To check if possible to reuse any of the previous or do a custom design (William).
- **Functional specifications for PSB are required to be communicated to Jonathan and Jose.**
 - ◆ This is essential to schedule BWS functionalities and acquisition system considerations.
 - ◆ Memory scaling and FPGA programming of both systems need to be adapted to these specs.
- **Cabling and Installation infrastructure:**
 - ◆ The installation of a Rack for fibre optics needs to be taken into account for integration (Jonathan)
 - ◆ The distance of the Rack with respect to the PSB BWS Machines is not critical (few meters are not a problem)
 - ◆ Cabling for PSB location already prepared by Jonathan.
 - ◇ Jose would like to check see if some cable for acquisition system proto are missing.
 - ◇ No Multimode fibres on PSB locations.

5. Actions

Responsible	Actions
Jonathan	<ul style="list-style-type: none"> • Check SPS scanner wire temperature (current or resistance) measurements possibility on parking position without scanning. • Provide motor tests results (when tested)
Jose	<ul style="list-style-type: none"> • Test both metallic disk samples with laser engravement (once both samples are available) • Study interferometry problem, check possible solutions with few modifications.
William	<ul style="list-style-type: none"> • Check SPS calibration bench size to be re-used with the PSB tank
Bernd	<ul style="list-style-type: none"> • PS wire scanner code to Dmitry. • Check losses situation on ring #2. • Send Functional specifications to Jonathan, Dmitry and Jose.
Dmitry	<ul style="list-style-type: none"> • Presentation on installation tooling • ECR progress • Check AL oxidation and reflectivity with time • Fork design update (wire fixation?) • Larger hole from opposite side foreseen. Check drawings.

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