Minutes of the 9th FOM meeting held on 29.03.2011

Agenda:

1) Follow-up of the last meeting (B. Mikulec)
2) Status of the machines (Supervisors)
3) Report on POPS problems (J-P. Burnet)
4) Schedule (B. Mikulec)
5) AOB
6) Next agenda

1. Follow-up of the last meeting

The minutes of the 8th FOM meeting were approved.

Follow-up from the last FOM:

Pending actions:

a) *See whether BLMs can be installed in TOF line (K. Hanke/BI)*

S. Gilardoni said that there are no BLMs in the TOF line and also no cables to install new ones. R. Steerenberg mentioned that the BLM installation in this line, as in FTA, was discussed with BI in the framework of the system renovation in the PS. B. Mikulec asked J. Tan to check with his BI colleagues. Action not closed.

b) *Problem with PS tune measurement with POPS (PS supervisor/BI)*

Tune measurement has problems when using POPS due to the noise mentioned in the past meetings. It is not clear if the noise is seen also by the beam or not. To determine if the noise is detected by the pick-up acting as an antenna, but not by the beam, some options are explored, including using a pickup that is not installed between the coils of the MU but in one of the SS. M. Gasior suspects also an issue with the grounding scheme and he will make some tests when the PS switches back to POPS. He would then need 2 or 3 accesses. Action not closed.

c) *Problem with the SPS horizontal damper (W. Hoefle/D. Valuch)*

E. Métral sent the SPS report before the meeting in which he mentioned that the SPS transverse damper set-up was finished for both the CNGS1 and LHC3 cycles (with 24 bunches). T. Bohl confirmed and added that an intervention takes place today. After the meeting, W. Hoefle sent a detailed report, in which he explains the origin of the problems (a bug in the damper pickup selection and a change in the input circuits for the horizontal tetrode amplifiers) and he adds that checks with several batches and 25 ns nominal beam are still outstanding. Action closed.

d) *Status of eventual problems caused to BI by the redefinition of MTG user names (BI)*

No news. Action not closed. J. Tan was asked to investigate with his BI colleagues. After the meeting, R. Steerenberg suggested that the action should be reformulated as: "Make the orbit measurement system work with the presently defined user files." The original issue will be followed up by the PSS and PS operations team.

e) *Monitor the Bdot at the reference magnet (M. Buzio/PS supervisor)*

Studies were stopped due to the switch to MPS. POPS current measurements at 50 kHz sampling frequency are not trivial. The studies will start again once POPS will be back in operation. The noise in fact disappeared after the switch to the MPS.

f) *Check the polarity of all the BBS in SPS before NA startup (SPS supervisor)*

Is underway. Action closed.

g) *Status of the PS-Bfield fluctuation (PS supervisor)*

The studies will start again once POPS will be back in operation. Action not closed.

2. Status of the machines

LINAC2 (F. Gerick):

An attempt to extend the timeout of the Linac watchdog in order to solve the overload issue did not work. A new attempt will be done during the technical stop.

The RFQ RF tripped three times. The voltage was lowered automatically by the security system and after two resets the RFQ was running again.

The technical stop started earlier than foreseen at midnight on Tuesday. In connection with the RF stoppage, a problem developed in the regulation of the DTL tanks cooling water temperature, which ran away touching the 1 degree max excursion alarm threshold by 9am. This temperature is constantly monitored to avoid vacuum problems. The problem is under investigation.

PSB (J. Tan):

It was a quiet week for the Booster.

Beam optimization took place, in particular RF-wise.

Small technical issues occurred:

- The beam was cut twice due to POPS interventions.
- The PS security chain tripped and could be brought back after a veto check.
- The Piquet CO was called as the Vistar did not display anymore the cycle evolution and quickly solved the TGM issue.
- Septum BT4.SMV10 went down several times. This is followed up by TE/ABT. After the meeting, M. Hourican reported that he could find no indication of a magnet or tank vacuum fault. He added that this problem may be related to a power supply issue or controls but he will continue to monitor the system.
- High intensity CNGS was optimised (3.4e13 p were accelerated).
- User MD5 was sent to the PS for MDs requiring large emittances.

ISOLDE

D. Voulot sent the report from M. Kowalska, which stated that the ISOLDE schedule until end of August is available at the ISOLDE website.

D. Voulot added in his email that there is still a lot to do on REX vacuum control and REXTRAP control. RILIS installation of the new laser system is ongoing, FE7 installation is almost ready. They are finishing the shutdown work and moving to cold check out from next week on.

PS (R. Steerenberg for Y. Papaphilippou):

There were two points highlighted for the PS this week: the switch back to MPS and the stop of nTOF beam.

- Switch back to MPS

Since the beginning of the week, it was observed that the injection field in all cycles was varying by about 1 Gauss peak-to-peak, whereas it was optimized, at the beginning of the run, by the TE/EPC experts to be ~0.1 Gauss. This caused LHC bunches to be injected in wrong buckets, which led to losses at extraction. Short technical stops were organized and TE/EPC found some burnt capacitors in the POPS output filters and it was decided to switch back to the MPS.

J-P. Burnet presented an update on this issue (see slides) and reported the failure of two 1.5 mF capacitors in the damping filters (CFx: overshoot damping capacitors). It turned out that the heavy load on these capacitors had not been accurately accounted for in the specifications. Peak and rms currents were within the design specs, but the cycle used for the POPS design report was not representative of the many voltage swings that are applied to the filter. J-P. Burnet added that this design report might have led the manufacturer to specify a DC capacitor instead of an AC capacitor.

The two capacitors were swollen and very hot, but did not explode, which is good news. As a remark, the type of the broken capacitors is not the same as the ones used to store energy.

As both output filters failed and there was only one spare capacitor available, it was decided to switch back to MPS.

The manufacturer is reviewing its design and has already planned to produce new units. The normal production time for this capacitor is 40 weeks. J-P. Burnet therefore estimates that POPS will not be ready for next technical stop in week 19, but he is aiming for the technical stop in 12 weeks (week 25).

J.P. Burnet also insisted on the need for more spares (price of such a capacitor is around 2000 Euros) and that it first has to be checked if the correct capacitors were ordered by the company before continuing the production.

Finally, the switch back to MPS was performed in 2 hours as foreseen, and R. Steerenberg confirmed that it has been transparent for the beams.

J-P. Burnet said that the 13MVA MPS backup would be kept as backup for POPS (not the MPS itself) to allow keeping the PS running in case of a POPS breakdown.

S. Gilardoni asked whether the noise on Bdot could actually be due to these capacitors. J-P. Burnet answered that there were 2 distinct problems: a differential ripple on POPS and a common mode problem (this has to be solved and capacitors will be added to limit the noise and filter to ground to try to solve the second problem).

R. Steerenberg added that the filter problem only happened from 16th March while the Bdot ripple was present from the beginning of POPS operation.

B. Mikulec asked if this switch back to MPS would have consequences for the supercycle composition and proton delivery. R. Steerenberg answered that the cycles were not optimised with POPS to have the back compatibility with the MPS, so for instance no changing in the arrival on the flat tops to make the cycles faster. Also the supercycles with POPS were scheduled to take into account the constraint on the maximum power the MPS can deliver.

- Stop of beam to nTOF

H. Breuker sent the TOF report before the meeting: “RP detected an anomaly close to the nTOF target station last Thursday morning. Since then the nTOF beam was switched off during the nights. During daytimes (including the weekend) the beam was back on for several hours to allow RP further measurements. This was done in close collaboration with the nTOF team. The data is now being analyzed and a meeting between RP and nTOF is scheduled for Wednesday morning in order to discuss the strategy.

During the meeting, R. Steerenberg and C. Theis mentioned that radioprotection was worried about oxygen releases out of the water cooling station of the target into the ventilation system. It appears the degassing system loses some gas, not knowing exactly how much and whether it represents an issue. C. Theis added that the source is not clear and that finding it is not trivial. Two measurements were scheduled during the day and nTOF hope to be ready by the middle of next week.

S. Hutchins asked whether we were running above the intensity limit on proton on target per supercycle. R. Steerenberg answered that 1.6e12 p/b (corresponding to the limit) was already sent last year and that no problems occurred. This limit was agreed with RP in the past taking into account the radiation measurement in the various nTOF zones.

- Other minor issues

Radiation alarms since the beginning of the week were caused by losses on the CNGS beam. The injection septum SMH42 was not pulsing correctly. Power and controls piquets changed a power-supply timing card, but the wrong septum pulses re-appeared. PICO put some order in several timing cables during another short intervention. Since then, the septum pulses correctly. A bad contact is therefore suspected to have caused the problem.

SPS (K. Cornelis for E. Métral):

It was the first week with CNGS at maximum production (4e13 protons).

A recurrent problem occurred with chilled water in BA4, leading to several trips of MSE4183.

Erratics on injection kicker (MKP generator 3 - PFN6) required a tube change.

A controls problem occurred when the LHC restarted a couple of JMS-broker processes on cs-ccr-jas1, which seemed to block the CNGS muon profiles. This may be due to an overloaded system.

The machine was stopped at 8am and the OP team tried to minimize beam sent to the dump.

D. McFarlane said that access was granted by RP and the scraper installation started according to plan. Repair on the critical magnet was for Wednesday. If the magnet cannot be fixed in situ, one needs to vent the sector of the proton inflector MKPs, and then one week of conditioning would be needed.

K. Cornelis added that the dump graphite block will be vented (intervention on the injection septum), and it is also known to outgas a lot. It could be cleaned up if beam starts already on Thursday evening.

J. Borburgh added that the vented MKDH are also expected to outgas with 25 ns and 50 ns beams.

On Thursday morning, D. McFarlane reported that ”things are looking very good regarding the repair of the magnet in 11910 in BA1 of the SPS. This was the magnet we discussed during the FOM that if they could not repair in situ and we would have to exchange the magnet then the SPS could be down for up to 2 weeks. The repair

was done yesterday and it has been under test during last night. The magnet group will go in this morning to verify it is all ok."

CTF3 (D.Manglunki):

- A vacuum leak was found in the delay loop, being fixed in the afternoon.
- There is good news on MKS13, which works fine after fixing vacuum problems on the RF structure.
- Matching and dispersion measurements were performed in TL1 last week.
- First recombination of a factor 4 in the combiner ring was achieved (no delay loop).
- CTF3 will be working during the technical stop.

CNGS

Before the FOM, E. Gschwendtner sent the CNGS report:

"It's running very good. We have already collected 2.75E18 pot since we have started.

The temperature of the helium tank entrance window which is downstream the horn is measured with probes mounted on the flanges of this Titanium window. In order to make sure that this window does not break, there is a temperature limit of 70deg (level1) and 73deg (level2).

This is a known issue and there is a ventilation duct just underneath this window to cool it. But because we have such a high duty cycle, the temperature limit is more often reached than when we have also the fixed target cycle included in the supercycle.

The mitigation is to either decrease the CNGS duty cycle or stop the beam for some minutes.

This issue has nothing to do with the CNGS target which is ~10m upstream the helium tank window. (Around the target we have also temperature probes which measure usually a value of ~21deg.)

Gran Sasso called me over the weekend and they want to transmit their 'Thank You' for the good beam performance."

TI (J. Nielsen):

There was a fire alarm due to smoke coming from a ventilation pump in AD. Pump was repaired. This issue was transparent for the users.

LHC interface with injectors (M. Lamont):

The LHC is going well. Collisions with 200 bunches with 75 ns beam enabled to obtain the peak luminosity record of 2.5e32 $cm^{-2}s^{-1}$. After that, the LHC switched to 1.3 TeV collisions for ALICE to calibrate cross-section taken with ions (proton energy equivalent to the energy per nucleon during the ion run). This physics run finished in time.

Scrubbing decision to be made at the LMC tomorrow (50 ns DB or single batch or maybe even 25 ns).

3. Report on POPS issue (J-P Burnet)

Details and slides are reported in the previous section within the PS report.

4. Schedule / Supercycle / MD planning

The restart of the Booster is tentatively planned for Thursday lunchtime.

R. Steerenberg said that OP would try to restart the PS around lunchtime (to be seen with R. Brown).

For the SPS, D. McFarlane and K. Cornelis hope to restart on Thursday evening.

The 2011 schedule (V2.0) is available at:
https://espace.cern.ch/be-dep/BEDepartmentalDocuments/BE/injector_schedule.pdf

All planned interventions for the injector complex are available via the on-line agenda:
https://espace.cern.ch/be-dep/FOM/Lists/Agenda/calendar.aspx

5. AOB

K. Kostro updated the interventions agenda with the following upgrades in the shadow of the technical stop:

- All timing receiver cards will be upgraded with a new firmware
- Central timing distribution for LHC will be upgraded
- CBCM changes for CPS will be made
- Sequence manager will be upgraded
- New version of MTG diagnostics will be deployed
- Scripts to update firewall and export list configurations will now be run every morning
- PVSS machines will be switched to use e-groups for authorised user list
- CMW release 2.9 (backward compatible)
- Other changes have limited impact are discussed directly with users

A. Bland added that a reboot of the Vistars for LINAC, East Area and ISOLDE will be performed.

6. Next meeting

The next meeting will be held on Tuesday, 5th April at 10:00 in 874-1-011.

Preliminary Agenda:

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2) Status of the machines
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Minutes edited by S. Gilardoni and B. Salvant