

Minutes of the 28th FOM meeting held on 14.10.2014

Agenda:

- 1) Follow-up of the last meeting
- 2) Status of the Machines
- 3) Schedule Updates
- 4) AOB

1 Follow-up of the last meeting

The minutes of the 27th FOM meeting were approved.

Pending actions:

There is an action concerning the rise timing of the recombination kicker in the PSB. M. Hourican will discuss with the specialists and report to the FOM the status and the plans.

2 Status of the Machines

Linac2 (G. Bellodi on behalf of D. Küchler)

On Tuesday afternoon the source was tuned to increase the beam intensity from the Linac2. K. Hanke commented that the PSB did not see any intensity increase.

On Thursday evening Tank1 tripped.

On Saturday afternoon LI.VVS10 closed and an intervention of the vacuum piquet was needed. The valve was closed probably due to a source flash over (20 min downtime).

PSB (K. Hanke)

All physics and MD beams were delivered and now operation seems to enter into a more stable phase. There were two major problems during the week.

On Tuesday (7 October) the extraction septum and BT.BHZ10 tripped simultaneously (3h 30 min downtime). They could be reset, but tripped an hour later again. First the power piquet, then the magnet piquet were called. Eventually the magnet expert required access. BT.BHZ10 was over-heating due to a flow restriction. They believe that something had backed up behind the needle valve, which is used to set the correct flow. When they moved slightly the valve, the restriction was cleared. The extraction septum trip seems to be unrelated. This equipment will need further investigation during the Technical Stop.

On Saturday afternoon and throughout the evening there were losses during the cycle on Ring 4. It seems to be due to an instability, which the transverse feedback was unable to correct. After lengthy investigations with the LL RF piquet, it was found that a setting of the TFB did not have the reference value. Setting it back to the reference improved the situation significantly. However, a transverse instability seems present on Ring 4.

ISOLDE (P. Fernier)

It was a good week for ISOLDE.

GPS: It is running with target #517 Ta running at 50 kV for IS 525 on the line LA1. Physicists collected data with ^9Li and ^{11}Li . Few collections took place on Sunday with ^{183}Ta for GHM and GLM lines. The target change took place on Monday (13 October), but it was not possible to correctly clamp the target. The issue was solved by a vacuum specialist intervention. The new target is #518 Ca0.

The GPS spectrometer magnet (MAG70) is not working as expected. The beam trajectory is varying each time a different mass is selected. Investigations are on going. On Tuesday night there were perturbations due to the thunderstorm.

HRS: The HRS line is still stopped due to a problem with the clamps. The piston was changed on the front-end: now the clamp/unclamp mechanism seems to work as expected, but the specialist (C. Mitifiot) asked to change as well the potentiometer for the detection of the target position. The intervention for the potentiometer is planned for today afternoon (14 October). In the meantime the new target is under preparation (#515) and will be installed on the front-end tomorrow (15 October).

[ISOLDE Users \(M. Kowalska\)](#)

GPS users are satisfied, but HRS users are still waiting for the beam.

[PS \(G. Sterbini\)](#)

It was a good week for the PS. In addition to the beams dedicated to physics (EAST North, nToF, AD, SFTPRO CT), the first part of the week was focused on the LHC beams for the Wednesday SPS MD whilst the end of the week was devoted to the commissioning of the East South line (T8) and the Ar cycle serving the SPS. The wire scanners and the kickers KFA13 and KFA21 are still not available thus delaying the commissioning of the SFTPRO MTE.

On Tuesday, the operation was perturbed by a problem in the PSB (3 h downtime).

Wednesday was mainly dedicated to MDs. During a scheduled access in the East Area, POPS went down due to an overlook in the access procedure (30 min downtime). The East low intensity spill was tuned.

On Thursday there were losses and perturbations for the AD beam at transition due to a problem of one of the 200 MHz cavities used for the longitudinal blow-up (solved by the specialist).

On Friday the IRRAD conditional beam permit was signed, the IRRAD patrol was done and the bending magnets deconsigned. The start of the commissioning was delayed but several interventions needed on the hardware (interlocks, vetos, unresettable devices, control issues): an access in the PS ring was required (3 h downtime). Finally the beam arrived at the end of T8 in the evening. During the night AD operation was hampered by a problem on its injection kicker (5 h downtime).

The weekend was mainly dedicated to improving the steering and the beam quality in T8.

R. Steerenberg added that the MTE kickers are now available, by there is not spare PFN. The present plan is to wait for the spare before putting the dummy septum blade in the IN position. In the meantime the LHC beam will be extracted using the new bump.

[East Area \(L. Gatignon\)](#)

The operation of the North branch (T9, T10 and T11) was very smooth, without major issues.

From T8 (CHARM and IRRAD) the last preparations for first low-intensity beams were made during the first part of the week. The beam permit was signed last Friday morning, with restrictions on the intensity and numbers of spills defined in a memo by RP (maximum 8 h per day with beam). Friday was mostly dedicated to solve some magnet and rectifier issues, requiring a few hours of access to the primary zone (mostly EIS magnets and SMH1). First beam was seen at the end of CHARM on Saturday. One vertical corrector cannot be controlled remotely for the moment. CO and EPC are working on this. Now up to 8 hours of operation per day in alternation with work around and on the roof of the facility (which requires beam off). The aim is to commission IRRAD and CHARM instrumentation and to study beam steering and focusing options. The expectation is that all remaining installation work can be finished by the end of this month.

East Area Users (H. Wilkens)

The T9, T10 and T11 user are satisfied with the beam condition. The T10 experiment has some problem related to their setup.

nToF ()

No report.

AD (B. Dupuy)

The week saw a great number of problems that slowed down progress with physics; some of the problems were resolved, some others have still to be addressed.

The major problem was affecting the cooling from 300 MeV to 100 MeV and lasted 37 h. The source of the problem was in the Schottky pickup amplifiers.

Another problem was related to the injection kickers that triggered several times the TT2 radiation alarm interlock (5 h downtime, solved by the specialists).

The C02 cavities dropped due to an over-current problem eight times in the night between 12 to 13 October.

ASACUSA complains about the positional stability of extraction. The operations team observed important position variations on GEM, but the fluctuations seem to have mysteriously disappeared.

K. Hanke asked why the different problems took so much time to be solved. B. Dupuy explained that the situation was made difficult by the thunderstorm glitches, the long super-cycle and the fact that initially all the effort was put in the wrong direction. Concerning the kicker problem, it was not promptly spotted by the CCC. G. Métral replied that during the AD “baby-sitting” the PS operators followed the procedure verifying the alarms. Since there were not fault messages, the AD supervisor was called to investigate the problem in more details.

AD Users (H. Wilkens)

Due to the problem with the AD ring, ATRAP did not receive beam during the week whilst ASACUSA and AEgIS lost several hours of data acquisition.

SPS (B. Salvant)

The start of the week was very busy with a large variety of issues to be solved in order to send the physics beams to the North Area targets, followed by very smooth running from Thursday afternoon onwards. Rather stable physics conditions could be achieved on T2, T4 and T6 with around 25, 17, 25e11 p intensity.

Vacuum pressures in ZS and LSS1 (in particular MKP4) are high with 25 ns beam (72 bunches injected at maximum so far with 1.2×10^{11} ppb). The situation of instrumentation improved significantly (e.g. MOPOS, monitors in TT20, wire scanners, fast BCT). The damper commissioning was announced to be complete.

Issues to follow up include:

- The RF transmitters tripped many times per day (in particular TRX3 and TRX4 towards the end of the week).
- The injection trajectories often suffer from sudden changes despite the efforts in the PS.
- The hunt for aperture restrictions should continue.
- Several faults turned out to be difficult to diagnose with the new systems (FGCs, access system).
- The switch from “access” to “beam on” sometimes requires manual movements of the bends or the collimators.
- A blocked collimator in H6 (XCSH.041.064) requires intervention next week.

Here is the detailed report of the main events of the week:

On Tuesday, a quadrupole before the T4 target was found stuck at its maximum current and First Line fixed this. Tuning continued, but was hampered by many issues external to the SPS in the afternoon (PS extraction quadrupole power supplies stability, PSB magnet, and finally thunderstorms that brought down the mains and the RF transmitters several times and flooded the BA7 Monte Charge).

On Wednesday, the first dedicated MD of the year took place with LHC 25 ns beam commissioning and aperture measurements. An access was organized to exchange one transverse damper amplifier in the middle of the MD in agreement with the MD coordinators and the physics coordinator to take advantage of the reduced cooling time required by RP with no beam extracted from the PS. The MD was allowed to finish one hour later as a result. An aperture restriction was found in 313, and another one was feared around the injection region, but was difficult to identify with the large injection losses. These large injection losses also hampered the 25 ns beam MD, and only 1 batch of 72 bunches could finally be injected and ramped, before longitudinal measurements were performed with 12 bunches. After the MD, the beam could not be sent right away to the North Area because of an MBE fault that took some time to diagnose, and was finally linked to a forced door (842) that needed to be rearmed (1.5 h lost for North area physics). The SMQD mains were put back in operation in the place of the spare SMQS at the occasion of the access.

On Thursday, transfer lines to target were re-steered and it was realized that the sign of the monitors around the T2 and T4 targets had opposed signs compared to before LS1. The beam was finally seen clearly on the target miniscans in both planes, and fine-tuning allowed reaching better quality beam. The injected intensity could then be increased up to the radiation limits. The ion MD beam was inserted in the supercycle, but a problem with the RF settings affected the physics beam for 45 min, before the MKD early interlock was masked. This issue (linked also to the coexistence of FESA2 and FESA3) is likely to come back every time a new cycle is included in the supercycle. Several power supplies tripped simultaneously in TT10, and surveillance was put on Friday afternoon to see what is happening, but no trips occurred since then. RF transmitters also tripped many times. Beam was otherwise stable with acceptable quality during the night (both Fixed Target and 72 bunches with 25 ns spacing). Also during the night, the damper commissioning was announced to be complete.

On Friday, following several trips of the SMQD mains, it was replaced back with the SMQS after less than 2 days of operation. The fixed target beam was very stable and steering on T6 took place. There was a first attempt to see the Ar beam in the SPS on Friday afternoon, but many issues occurred in LEIR and PS, and finally beam was seen on BTV1001, but could not be injected into the SPS yet.

During the weekend, the SPS ran very smoothly with the Fixed target beam in parallel with 72 bunches of 25 ns spacing. The vacuum and temperature of MKP4, as well as ZS pressure are increasing slowly, getting

closer to the threshold. A third batch of kick response measurements took place to check if more could be done to improve the MOPOS situation. Two other faults on extraction elements were difficult to diagnose on Saturday evening: one required rebooting one of the three BA2 FGC servers, and the other one required resetting several access zones before finally finding the one that was inhibiting the chain.

North Area (L. Gatignon):

The beam on T2 was available from Friday (3 October) and the H2 and H4 beams delivered good beam to the users during the whole week, in spite of a number of magnet and rectifier issues. The access program did not always work correctly as expected since the TAXs are not always sent correctly to the end switches. STI is following this up with OP. In parallel more work was invested in the rectifiers and special software dedicated to M2 and P42/K12 operation.

The beam setting-up on T4 was completed on Thursday early evening (9 October) and first beam on T6 was seen later on that day. Until then the beam in H6 and H8 was not stable. After beam commissioning the beam could be set up properly. In H6 a collimator in TCC2 is stuck in half-open position due to a hardware problem. During the MD tomorrow (15 October) an attempt will be made to fix this. In H6 there were also a few fake radiation alarms due to a too low threshold setting on one of the monitors at the end of the beam line solved by increasing the monitor threshold. On Friday, there was a problem with one of the keys in access door PPE172.

On Friday the M2 beam for Compass was set up in muon mode for the detector commissioning. This was extremely smooth. COMPASS itself is still suffering from the absence of liquid He for the cooling of their polarized target, but the situation is getting better.

On Friday morning the long setting up of P42 and K12 started well. Good beam is available on the T10 target and the tuning of the K12 kaon beam started on Saturday late afternoon. Low-intensity beam is already available for setting up of some of the NA62 detectors, but much more work is required to provide correct beams at full intensity.

North Area Users (H. Wilkens):

It was a successful start for the North Area.

CTF3 ()

No report.

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Linac3 (G. Bellodi on behalf of D. Kuchler)

On Tuesday afternoon some source tuning increased the beam intensity from the Linac3 (>10% more beam in BCT41).

LEIR (S. Pasinelli)

The week was dedicated to improve beam stability and efficiency at injection, orbit correction and ameliorations of the transfer line.

During these adjustments, operation has been hampered by controls errors on the power supplies and the RF crate error. The source controls errors on the power supplies are not yet understood. TE-EPC is constantly monitoring them.

Until the end of this week, it was impossible to use YASP for the orbit correction because of the discrepancy between normalized strength parameters and the real correction of the GFA function. With the help of the LSA team a workaround has been put in place.

The OASIS signals of the main quadrupoles are still showing a strange behavior (problem observed for the first time in July). A solution is available, but it is still under discussion if the budgetary coverage will be provided by BE-CO or TE-EPC. K. Hanke commented that TE-EPC should provide the control hardware as part of their system. C. Mugnier will report and discuss in TE-EPC to find a solution. An action as been opened.

Operation of the LEIR machine is hampered also by communication problems of the control system with the power supplies. If a power supply goes in off mode the warning on the working set appears only with a large delay preventing a prompt reaction to re-establish the stable beam condition.

PS (G. Sterbini)

The Ar cycle was regulated in the longitudinal plane. S. Hancock explained that the energy matching between the two machines required several adjustments

- To lower the injection magnetic field in the PS,
- to offset the radial position in the two machines,
- to conveniently adjust the phase loop.

There was also an attempt to improve the Ar transmission (50-60% efficiency) from LEIR to PS.

TI (J. Nielsen)

There was a problem with the 8 kV network during the week. During the weekend there was a network glitch observed at CERN and later confirmed by EDF.

3 Schedule Updates

The Injector Schedule (v1.7) is available at

https://espace.cern.ch/be-dep/BEDepartmentalDocuments/BE/Injector_Schedule_2014.pdf

There are no news to report concerning the schedule.

G. Bellodi asked to schedule an intervention exchanging a RF tube in the Linac2 (1 h intervention). After discussion it was scheduled for tomorrow (15 October) from 10h00 to 11h00.

4 AOB

The Linac2, PS and PSB technical coordinators briefly reported on the intervention requests received for the next TS (29 October). The list of the interventions can be retrieved in the IMPACT database.

J. Vollaire received the interventions list and the (preliminary) needed cool-down is 12 h for EAST and high intensity beams and 3 h for all others beam. This would introduce a significant overhead on the 8 h TS. The proposal of the FOM is to track down the interventions that are driving the cooling time constraints and to evaluate the possibility to postpone these interventions to the Christmas technical stop.

C. Mugnier asked if the EPC piquet needed to fill an IMPACT request if he has to access the machine. R. Steerenberg explained that the IMPACT request is needed only during the technical stop period. During the operation period, the CCC will communicate the general IMPACT number needed to start the operational dosimeter (DMC).

K. Hanke informed that there would be a maintenance intervention on the door YEA04.PSR=353 (ex D.101) next 16 and 17 October.

F. Tarita informed that maintenance work would be performed during the TS on the RTU EFESBE-2. It will be transparent for the other interventions.

A. Bland reminded that BE-CO will intervene on the TN CCC/CCR Router on 29th of October Technical Stop from 9h00. This will not affect the TS activities, but could perturb CFT3 operation.

The next FOM meeting will be held on the 21st October. The agenda will be communicated in due time.

Minutes edited by G. Sterbini.