

Minutes of the 27th FOM meeting held on 07.10.2014

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 26th FOM meeting were approved.

Pending actions:

There was an action concerning the wire scanner availability in the PS and PSB. After the reparation of both the wire scanners in the PS (54H and 68H), BI-BL strongly recommended not to have consecutive scan with interval shorter than 10 s. On Thursday (2 October) the wire scanner 54H broke again even if the 10 s condition was fulfilled. After that episode (3rd wire scanner breakage in a month in the PS) the PS wire scanner will not be used until further notice. K. Hanke asked if the 10 s rule could be relaxed in the PSB. L. Soby will transmit the question and report the answer.¹

2 Status of the Machines

Linac2 (M. O'Neil)

It was a good week for Linac2.

On Saturday at 14h00 a loss of the BCT acquisitions for TRA40, 50 and 60 and BI10 caused the watchdog to cut the beam until the power supply and crate housing the electronics was replaced. Just before this fault a period of instability in the beam intensity was experienced with an intermittent loss of ~30% intensity after TRA20 for approximately 5-10 cycles, repeating every 2-3 minutes. Once the previous fault was repaired and after an hour of ISOLDE beams the intensity instability reappeared. Adjustments to the settings of the RF power supply in Tank3 greatly reduced the problem. Some more investigations concerning the Tank3 settings will be performed by RF specialists. If some interventions would be needed, one could try to run until the 29 October TS. L. Soby commented that the intensity instability was not due to problem to BI equipment.

PSB (E. Benedetto)

It was a difficult week for the PSB.

It started on Tuesday afternoon with 1 h downtime due to a TGM problem (the rack with timing distribution front-ends was down).

During the investigation it was discovered that the rise-time of the recombination kickers KFA10 and KFA20 is of the order of 140-150 ns instead of the nominal 93-105 ns. This affected SFTPRO Ring1, with adjustments to be done on the kicker Fine Delays and on the trajectories to the PS, and probably also the AD

¹ After the FOM, L. Soby informed that there is NO time limit any more for the PSB wire scanners.

beam. It is also a concern for the preparation of the “longer” LHC bunches (for space charge mitigation at PS injection). The kicker specialists are aware of the problem and investigating. K. Hanke commented that this is an operational issue. An action has been opened. S. Gilardoni added that a beam based measurement will be organized and in addition one could try to use the PS damper to compensate the induced mis-steering.

On Thursday morning, the distributor BI4.DIS tripped and had to be reset 4 or 5 times. A thyatron was changed (~1 h downtime). On Thursday night at 00h37 the MPS went down and it was impossible to reset it. Investigation continued till the morning with several piquets and experts called. Finally it was discovered it was due to a problem with the WIC. Such problem can be in principle reset via the application, but for not clear reasons, it was impossible to login. The specialist had to be called and restart the PLC itself. He will investigate and report to PSB-OP. A. Bland asked what was the problem with the login. E. Benedetto answered that the expert gave us the password but it did not work.

After the MPS was back, all the FGC3 were in bad state. The piquet EPC-CO was called. Beam was back at 06h43.

On Saturday morning a problem on the B-train caused 3 h downtime. The problem was solved by the specialist who did some welding on the power supply of the pulse repeater of B-up train. In the afternoon operation was perturbed by the Linac2 problems (4 h downtime). In the evening, a problem with a flow-meter (BTY.BVT116) in the ISOLDE extraction line caused several trips. On Sunday morning the EPC piquet changed the flow-meter and solved the problem.

Many MDs and MD setting-up took place during the week: beam shaving at 160 MeV, LLRF studies, beam based impedance measurements, extraction BPM checks, resonance identification, modeling of the injection line for YASP.

M. Kowalska asked, if possible, to increase the ISOLDE pulse up to $3.3E13$ ppp.

P. Sollander added that TI will investigate (after the request of M. Zerlauth) if some of the problem during the week could be correlated to the perturbations in the electrical network.

ISOLDE (D. Voulot)

HRS: there was no operation on HRS due to the HRS front-end (a piston blocked). There was an intervention during the weekend to remove the piston. For the moment there is not a clear schedule. M. Kowalska commented that the users would like to have beam for next weekend. R. Catherall and the ISOLDE team are working hard on the issue to solve it as soon as possible.

GPS: ^{11}Li target installed was installed on Wednesday and the beam was sent on the target since Friday evening. This running is proceeding well and will continue until Thursday.

ISOLDE Users (M. Kowalska)

GPS users are satisfied whilst HRS user are waiting for beam.

PS (R. Steerenberg)

The PS had a rather good week. Throughout the week there were quite a few issues with injection and extraction kickers that required resets and specialist interventions.

On Tuesday there was a problem with a rack containing several front-ends, among which “cfc-ccr-ctxsps” that caused some problems in the PS complex with java application as the telegram was no

longer correctly received. The breakdown lasted an hour, which was longer than necessary, as finding the right specialist to intervene was not trivial, following the increased granularity of specialists since early 2014. The rack contained front-ends that were under the responsibility of different groups (CO and BI). M. Gourber-Pace informed that the CO and BI front-end crates would be distributed over different racks.

On Thursday the wire of the wire scanner in SS54 broke again. This wire scanner together with the one in SS68 was repaired about one week ago. BI has decided that in the PS wire scanner measurements are no longer allowed until further notice. Yesterday a meeting with BI took place to discuss the issue and to establish an action plan. Some of these actions consist of making a clear overview of all changes made to the wire scanners during LS1, but also to investigate if something was changed in the production process of the wires. BI will also perform tests on the broken FWS54 to analyse more precisely potential issues with the movements and with another functioning wire scanner to study the wire temperature behavior during successive scans.

On Friday the East Area IRRAD DSO test was completed and the beam for commissioning is foreseen for Thursday (9 October). This means that the beam permit needs to be signed by Wednesday afternoon (8 October). During the DSO test the ZT8.BHZ01, an EIS.F, did not function because of a broken ventilator in the power converter. This power converter was nevertheless tested successfully during the previous week.

The PS, beside the EAST, AD, TOF, LHC 25, LHC 50 and ions is providing the SFTPRO beam using CT extraction, as the MTE setting up is still on hold waiting for the repair of KFA13 and KFA21, which is foreseen to be completed by the end of this week or early next week.

Also during the week B-field fluctuation measurement/studies continued. Presently the integrating coils are under investigation and analysis on the data taken this week is ongoing.

East Area (L. Gatignon)

On Wednesday, at the end of the access to T8B, ZT10.QDE1 and ZT10.QFO3 were found in fault and fixed by the First Line. But QDE1 should not go above 550 A, which has been like this in the past and is anyway ok for the present maximum momentum of 6 GeV/c.

The low-intensity beam for IRRAD and CHARM has been set up in the machine. The first low-intensity beam should be received on Thursday, following a memo by R. Froeschl that will set the limits. In fact the limitations are related to the fact that

- the roof shielding is not yet completed,
- the ventilation will not be operational before end of October,
- two rollers below the mobile shielding must be replaced in 2 to 3 weeks from now.

East Area Users (H. Wilkens)

The East users are satisfied with the present beam quality. Tomorrow (8 October) a 1 h access will be organized during the dedicated MD.

nToF ()

No report.

AD (J.-C. Oliveira)

Operation was hampered by an instability at the AD injection. This was producing frequent radiation alarm. RP is investigating for placing the monitor in a more convenient position. During the week the vacuum chamber of BASE has been replaced.

T. Eriksson acknowledged CO for the support during AD operation.

AD Users (H. Wilkens)

The AD experiments are still suffering from the delay of helium provisions. During the liquefier fault a large amount of helium was lost. At the moment the liquefier restarted but the amount of gaseous helium available is not sufficient to cope with the liquid helium request. At the moment the helium delivery schedule is well assessed but the long-term problem still remain since the helium production rate will not meet the experiment needs. K. Hanke will report the problem to the IEFC.

SPS (V. Kain)

The DSO test for the North Area took place on Monday, Tuesday, Thursday afternoon for ECN3 and TCC8 and Friday to do the final checks for LOKN.

On Tuesday the vacuum-leaking module containing a miniscan at the ZS was exchanged. Vacuum pumping and short ZS conditioning took in total until Wednesday afternoon. Beam was back on Wednesday afternoon.

On Thursday evening the TED was taken out in TT20 to steer the beam to the targets for the first time. The beam was transported all the way to the second splitter, where the beam was lost. Further progress on Thursday night was hampered due to an MPS issue in the PSB.

On Friday morning an intervention for damper H1 took place. During the intervention it turned out that a filament heater of the H1 amplifier was broken and needed to be repaired in the tunnel. The intervention will have to be scheduled middle/end of next week. The intervention has to be first carefully prepared and tested in the laboratory. Running with only one horizontal damper is compatible with operation up to intensities of about $2E13$ ppp.

On Friday evening the beam was steered finally to targets T2 and T4 for the NA physicists to start setting up the beam after the targets. The weekend was dedicated to optimizing the girder positions of the extraction elements for loss reduction, check out the instrumentation such as the servo spill BSI and delivering low intensity beam to the NA for setting up.²

North Area:

Setting up of the beam lines in EHN1 has started over the weekend. There are still some uncertainties or questions concerning the beam characteristics at the primary target still under investigation.

COMPASS will start this afternoon with muon beam (the experiment not ready). At the moment there are no known problems apart from the one relative to their CESAR console.

NA62 setting up will start once TRIM-10 will be repaired (J. Baume is informed). The beam will be at low intensity for the moment. Overpressure in the double wall (air separation between TCC8 and ECN3) will be

² After the FOM, B. Salvant informed that the intervention of the SPS transverse damper amplifier will take place today (8 October) from 16h00 and 17h00. The SPS beams will be stopped from 15h00 and 17h00.

made operational during the scrubbing week. This has no impact on the physics program of NA62 this year, which foresees low intensity apart from a week at the end of the run.

CTF3 ()

No news.

IONS

Linac3 (M. O'Neil)

It was a good week for Linac3.

On Monday (6 October) the RFQ tripped due to driver fault. The fault was repaired by the RF specialist (several hours of downtime).

LEIR (M. Bodendorfer)

Throughout the whole week, LEIR delivered beam to the PS with a longitudinal emittance within specification. Overall, the machine performance was hard to reproduce from shot to shot. A fluctuation of injected intensity of 15% within minutes and 30% over several hours, disabled any systematic fine-tuning.

On Tuesday, extensive RF-MD identifies that the beam loss after RF-capture are not related to neither the RF system nor the transverse feedback damper. Optimization on the transverse corrected the tune throughout the cycle and made it more stable through the acceleration ramp.

On Wednesday the quadrupole power supplies (mainly ER.QFN1030) were not stable. Large fluctuations were observed on OASIS. Beam was extracted at less than 50% of expected intensity.

On Thursday, for the first time, the intensity fluctuations with a period of 24 h were observed. J. Wenninger updates the YASP orbit corrector tool from changes which he made in AD and which have not yet been propagated into the LEIR YASP system.

On Friday the start of the phase loop of the RF system in LEIR was delayed to make it start 10 ms after RF-capture. This gives the beam enough time to bunch at fixed frequency without phase loop interference. The PS demanded higher extraction energy from LEIR. LEIR will provide this higher extracted energy next week, as soon as the value of the extracted energy is provided exactly. A momentary estimation would result in an extracted field change of about 25 Gs.

On Saturday, the oscillation of the extracted intensity, first suspected on Thursday, is now clearly repeated since then and persists with a period of 24 h. A first successful correlation attempt with vacuum pressure failed after Friday, where the vacuum pressure remains low, but the extracted intensity continues to oscillate. We suspect that another mechanism, rather than the vacuum pressure, is responsible for the 24 h oscillation in extracted intensity.

On Sunday, the ZERO cycle in LEIR was modified in order to reduce the effect on the following cycle.

In the following week, they will concentrate on stabilizing the machine with respect to the injected intensity.

M. Bodendorfer expressed his concern about the machine reproducibility and asked higher priority for the LEIR needs. K. Hanke will report the LEIR request to the IEFCE.

PS (R. Steerenberg)

There was nothing special to report.

TI (P. Sollander)

On Sunday afternoon there were perturbations due to the strong thunderstorms.

3 Schedule Updates

The Injector Schedule (v1.7) is available at

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

The intervention for the TS on the 29 October will be discussed in the following FOM (14 October).

4 AOB

D. Kuchler presented two possible options for the Linac2 maintenance.

In the first option one can consider only the replacement of the cathode (needs some hours). The status of electrodes and insulators should be good but cannot be guaranteed. The new cathode needs normally 6 weeks conditioning before it reaches full performance but the available 5 weeks may be sufficient. In that scenario, the source has to run over the lab closure (without HT) and later failures of the source body cannot be excluded.

The second option is to rebuild the source (including cathode exchange). The specialists would need 10 working days. This implies that the cathode conditioning can only start one week before linac restart, but would still need around six weeks conditioning before reaching nominal intensity. Therefore there will be several weeks of low and unstable beam during injector chain set-up, reaching into the LHC start-up.

V. Kain commented that during the start-up phase, the intensity of the LHC beam will be modest. S. Gilardoni asked what the impact would be if the first option (only cathode exchange) is followed by the source failure. D. Kuchler answered that in that case one has to rebuild the source, that is one as to go through the second option.

After discussion, it was concluded that the FOM endorses the second option. Confirmation by the IEF and LMC are required.

K. Hanke informed that D. Chapuis asked to approve the maintenance on the access door YEA02.PSR=352 on Thursday and Friday (9 and 10 October). Helmut Vincke commented that before approval the radiological situation have to be assessed. After the FOM, J. Vollaire informed that the maintenance at the door YEA02.PSR=352 will not be done this week, as the radiological situation within the access point and the maintenance door needs to be further assessed. GS-ASE will perform the maintenance of other PS doors as YEA04.PSR=353 or YEA03.PSR=151.

The next FOM meeting will be held on the 14 October. The agenda will be communicated in due time.

Minutes edited by G. Sterbini.