

Minutes of the 21st FOM meeting held on 26.08.2014

Agenda:

- 1) Status of the Machines
- 2) Schedule Updates
- 3) AOB

1 Follow-up of the last meeting

The minutes of the 20th FOM meeting were approved.

Pending actions:

There was no open action.

2 Status of the Machines

Linac2 (R. Wegner)

It was a good week for Linac2.

On Thursday the attenuation of the current transformers (T02, T06, T07, T10, T20, T30, T40, T50, T60) was increased (from 14 to 28 dB) to avoid saturation of ADCs. The readings became more stable.

On Friday LA2.QFN13S tripped. Its power supply was exchanged by the piquet (20 min down time).

On Monday LI.QFN30 tripped and the watchdog stopped the beam. A reset of the power supply solved problem.

J. Vollaire asked for details on the high radiation level produced on Friday afternoon. He said that, when a radiation alarm triggers, the OP teams should react as fast as possible to stop the beam and to investigate the problem. R. Wegner explained that the reason of the losses was a power supply fault (LA2.QFN13S). The watchdog cut the beam as foreseen, counting the bad pulses for each user down from 3 to 0. In total, 48 shots were sent with high beam loss. The time depends therefore on the composition of the supercycle. An action has been opened for RP to inform the FOM if the watchdog algorithm has to be modified.

Curves have been added to the Linac2 logbook, entry:

<http://elogbook.cern.ch/eLogbook/eLogbook.jsp?shiftId=1056554>

After R. Wegner report, J. Vollaire gave an update on the radiation monitor PAX23. The slides can be found at

https://espace.cern.ch/be-dep/FOM/Presentations_2014/Forms/AllItems.aspx

J. Vollaire explained that in the design phase the new shielding around PAX23 it appeared clear that there was an important space constrain for the required shielding to maintain the radiation dose present in the zone before the wall removal. The required chicane would have not allowed the installation of all the equipment of the new access point (MAD+PAD).

The radiation doses of the last month were shown. When there is more intensity request they exceed systematically the 10 $\mu\text{Sv/h}$. The data measured in PAX23 are in agreement with the one of PAXLN201.

In order to measure the radiation level in a larger zone around PAX23 and closer to the visit circuit of the Linac2, a radiation measurement campaign was launched. The radiation on the visit circuit resulted to be about 10 times lower than the one observed in PAX23. Measurement on the top floor has still to be performed.

Recalling the limit of the low occupancy area (15 $\mu\text{Sv/h}$ for warning), the definition of the low occupancy area and the use and scope of the areas located in the proximity of PAX23, J. Vollaire reported that it was decided to reclassify the area as low-occupancy increasing the radiation threshold of the PAX23 accordingly. This solves the problem of the radiation alarm for the moment. In case the new threshold level will be overcome in the future, RP will fence off part of the area.

PSB (J. Tan)

On Tuesday due to the increased Linac2 intensity, the input signal to the injection trajectory system was saturating the amplifiers. This explains the lack of beam excursion induced by corrector bumps. Extra-attenuators were added by the specialist and the issue was solved. Upon request of the OP team, the horizontal cables of LT.BPM50 have been swapped. The injection trajectory now matches with YASP. However the cable inversion will be checked during the forthcoming TS. In the evening, C02-R4 went down. The specialist came, and worked till 02h00 but could not solve the problem. He suspected a connection problem. The temperature in the RF cage was 28 °C, but this could not explain the issue. AD and ISOLDE were affected.

On Wednesday the RF specialist switched off BR1.C02 for 30 min to understand the problem with BR4.C02. In addition a problem with the C16 on ring 3 occurred, due to the aging of the RF tube. The maximum voltage produced was 3.6 kV instead of 6 kV nominal. On Thursday afternoon a machine access was scheduled. The beam was off for cool down at 13h30 and the access started at 14h00 lasting for 2 h. It was found that the problem of BR4. CO2 was due to a short circuit on the cavity (fixed) and the problem on BR3.C16 was solved by exchanging the RF tube. Beam was back at 17h00.

The second part of the week was quiet.

On Monday morning the R4-TFB needed a local reset and afterwards the ejection kickers went off. The operator found the electrical breaker of the oil system down. The specialist was called. He could remotely help the operator to restart only three kickers. Eventually he came in to restart the last module (2 h downtime). At 04h00, the 18 kV filter went down. The EPC

piquet for the filter could not be reached so the First Line was called. This does not prevent beam production but induces unwanted reactance load in the electrical network. EPC “tolerates” tolerates exceptionally operation without the filter for few hours. Before putting the filter back, both the PSB and PS have to be off according to the procedure. K. Hanke commented that C. Mugnier will present the procedure for the compensator restart and the EPC piquet structure under AOB. In the afternoon two BLMs were found not working. The expert was called.

Concerning the setting-up, EASTA and TOF beams have been set-up while the H2 splitting in SFTPRO is commissioned only on R3. LHC25 setting-up started and STAGISO was set-up and sent to GPS on Friday morning.

K. Hanke added that for the next week SFTPRO is the priority for the LLRF expert over AD and LEIR work. R. Steerenberg confirmed that the PS needs the beam as soon as possible to prepare the beam for SPS.

K. Hanke and B. Mikulec informed that with the beam setting-up a sufficient number of cycle must be allocated. R. Steerenberg commented that the basic supercycles and relative percentage for each user will be circulated. K. Cornelis added that, if needed, the SPS has some flexibility to accept longer supercycles to accommodate the different users.

ISOLDE (E. Siesling)

It was a busy week.

HRS: Presently running with target #510 UC with quartz line (to control the Cd versus Cs release) at 30 kV. On Tuesday the RILIS laser was tuned on Cd and proton scan were done on the target converter followed by Cd yield checks.

On Tuesday evening Cd beam was sent to the ISOLTRAP experiment until Thursday afternoon when the run finished. The average proton intensities was between 1 - 1.8 μA .

Concerning the HRS problems, the AQN/software values in working set of separator magnets cycling do not coincide with the actual teslameter values on the display. After replacing one of the teslameter with its spare, the situation improved. E. Fadakis together with P. Galbraith, M. Butcher and M. Buzio (TE/MSC) are following up this problem.

GPS: Running with target #463 Pb since Tuesday. In agreement with the users it was decided to run at 30 kV (instead of 50 kV) to avoid sparks endangering the lifetime of this used target.

The target coupling problems faced on Monday were overcome after changing the clamps on the target unit as well as re-aligning the high-current connectors for target heating to decrease the friction while coupling. After these steps target #463 has been placed on the calibration pump stand to make sure that the target was leak tight.

New problems started on Wednesday when setting up stable beam: the target heating

dropped. After investigation and analysis the cause was found in a faulty potentiometer on the GPS front-end clamping system giving a random acquisition for the clamp position. A temporary and acceptable solution proposed BE/OP and A. Gottberg EN/STI was found on Thursday in setting the clamps position to 'closed' in the PLC. It was implemented with help of C. Mitifiot, A. Masi and M. Donze. The temporary fix will avoid the cuts of the isolation transformer, the HT and the vacuum GPS10 provoked by a wrong clamp status whereby the individual interlocks for target current, high voltage and vacuum remain active in protecting the machine and target.

Concerning the physics, on Thursday night stable beam tuning was performed to GLM (CRIS DSS2 chamber), LA1 (TATRA experiment) and RC4 (Decay station). STAGISO proton-scan was done on Friday morning followed by yield checks on Hg and RILIS laser tuning on Hg. For the STAGISO proton beam PSB OP adjusted the gate timing for the BCT to catch all three bunches taking the bunch distance of 16 μ s into account.

The physics started according to schedule on Friday evening with shared beam to GLM (182Hg) and LA1 (189Hg).

The proton integrated beam current reached 0.5 μ A with low intensity STAGISO proton pulses up to 7E12 ppp.

GPS is very stable. There were no hick-ups of interlocks for the heating, HV or vacuum over the weekend. The solution to the clamp status problem is working.

On the coming week GPS physics will continue. Next GPS target will be changed on Monday (1 September). HRS will not restart until the end of the coming week with a run on Hg with the same target. Next HRS target will be change Monday 8 September.

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

The HRS users are satisfied and the GPS's ones are very satisfied.

M. Kowalska asked if it is possible to have 3e13 ppp. K. Hanke answered positively.

B. Mikulec asked M. Kowalska if the users planned data acquisition stops in the next two weeks. M. Kowalska will check and will report the information. B. Mikulec added that this information could optimize the use of the beam time for setting-up.

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

This week the PS delivered beam to the East Area, nToF and the AD. There was a significant progress in the commissioning of the EAST with the parasitic nToF, MTE and LHCINDIV. Concerning ions, injection timing and injection elements were checked and the PS is ready to receive the Ar beam this week.

On Monday late afternoon, due to the unavailability of the KFA4, nToF and AD beam could not be produced (2 h perturbation).

On Tuesday, there was a 4h30 stop for the EAST beams for an intervention on the quadrupole ZT9.QF003. During the night a fault in the injection kicker stopped all beams for

4h40.

On Wednesday operation was perturbed due to the unavailability of the unavailability of PSB Ring 1 and 4. RP requested to send the beam to different targets on the East Area to make radiation tests. As outcome RP asked to reduce the intensity of the East spill to $20E10$ p.

On Thursday afternoon there was 3h30 stop for an intervention in the PSB. Profiting from the stop, the PFN of the kickers 13 and 21 were inter-changed. At the end of the afternoon the parasitic nToF extraction was commissioned.

On Friday operation was hampered by minor trips in KFA4 and the extraction bumper 14.

During the weekend the slow extraction of the EAST beam of the EAST with nToF parasitic was commissioned and the beam was sent to the experiments.

On Monday evening a fault occurred on the KFA21 (high voltage diode broken). Investigations are on going to understand the source of the problem before replacing it with the available spare. In the meantime it was decided to put the dummy septum 15 in out position and to extract TOF using the old extraction scheme (using only KFA71).

Tuesday morning investigations on KFA21 are on going, and possibly the kicker will be back in the afternoon. In that case the new extraction will be put back in place.

D. Manglunki asked about the status of the sublimation in the PS. R. Steerenberg answered that he will ask P. Demarest if automatic sublimation is already put in place. If it is not, he will ask to start it.

[nToF \(\)](#)

No news.

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

Concerning the problem on the ZT9.QF003 it was due to the cable of the interlock that was disconnected. Now the problem has been fixed.

[East Area Users \(H. Wilkens\)](#)

The users are satisfied.

[AD \(T. Eriksson\)](#)

Since last Monday there was slow progress on various issues.

There is a longitudinal blow-up at 2 GeV/c. For the moment a workaround has been implemented and investigations will continue.

The new orbit corrector polarity issues were finally sorted out with orbit response

measurements.

There are random aperture limitations caused by the stochastic cooling movement systems going out of control.

It took a long time to set-up the tunes to get down to 300 MeV/c with correctors on and still the large orbit excursions is not solved. The investigations with YASP are on-going.

At the moment about 50% of beam surviving at 300 MeV/c and the next step will be the set-up of electron cooling and the extraction. This week there is no possible beam extracted moreover the stochastic cooling has still parameters that cannot be controlled.

After discussion and considering the present AD issues and the Users schedule, T. Eriksson informed that AD could tentatively deliver beam to the experiment on next Monday (1 September).

SPS (B. Salvant)

The SPS is in cold check-out since yesterday (25 August) but still many interventions were performed these past days (vacuum leaks, vacuum pump, wire scanner, head-tail monitor, kickers, high bandwidth feedback kickers installation). There are still a few interventions to come but number is going down.

There are still many power converters in fault. The fact that now only First Line (and not TE/EPC) is in charge of all SPS power converters together with absences of experts during holiday period is not making things easier.

However, there is very strong effort from all groups to be ready for the DSO tests tomorrow (27 August) and Thursday (28 August).

Shifts had to start at 06h00 for TDC2 cabling activities this week.

RP warned that there is still a lot of equipment lying around the tunnel and that everything has to be removed before the beam commissioning.

The MKP water manifold was fixed on Thursday after many attempts, and conditioning has started only after the repair. As already announced by TE-ABT it will take 3 weeks to condition the MKP. K. Cornelis informed that, due to the water manifold problem, there will be a modification on the SPS schedule. The beam will be available from week 38 and the scrubbing run is likely to be delayed by one week. K. Hanke commented that the re-scheduling of the scrubbing run has to be discussed with all parties involved. A. Bland commented that the SPS restart will not be perturbed by the technical network disconnection test scheduled on the 8th September.

D. McFarlane informed that from the 1st September the SPS IMPACT requests will be signed by BE-OP and no longer by the SPS technical coordinator.

Linac3 (G. Bellodi)

The intensity of Linac3 increased during the week.

On Tuesday operation was perturbed due to a problem on the door of a HV cabinet. After checking the door and resetting the generator the issue was solved.

The beam stopped on Friday for the pepper pots installation.

G. Bellodi reported that a RF amplifier went off due to a water interlock on Friday night but the alarm was propagated by CV only yesterday (25 August) in the morning. G. Bellodi asked to the CV representative to comment on it. J. Lehtinen explained this kind of problem is intrinsic to the architecture of the system. CV is evaluating the possibility to consolidate this station. At the moment the source of the problem has not yet been understood and investigations are on-going. G. Bellodi requested a systematic monitoring (even once or twice per day) of the cold water temperature. . An action has been opened for CV.

LEIR (J. Axensalva)

During the past short beam week (Linac3 pepper pot intervention on Friday), the electron cooler was restarted on top of the "bare machine" while maintaining ~50% of the Ar target ($1.5E10$ charges accelerated) also with the help of continuous improvements on the Linac3 side.

After the tuning of the longitudinal and transverse plane the beam was accelerated up to the flattop energy.

On Thursday the first shots of Ar beam were sent to the ejection line TV screen. More adjustments are still needed to get something exploitable for the PS this week (RF, timings, etc.). YASP was successfully used to create the extraction bump.

Now that the acceleration and extraction have been commissioned, the RP measurements on the LEIR visitor platform can be performed. This is scheduled this Friday 29th of August.

In the next days the extraction to the PS will be optimized. Nevertheless, operation is perturbed by unstable conditions on the power converters. The measurements revealed that the GFA of the power converters are disturbed by high frequency noise. It seems that the root cause is now identified as electromagnetic compatibility issue (shielding/grounding) on the cables carrying the GFA digital references and the acquisition request pulses sent from the CTVOR cards to the G64 electronics chassis inside the power converters. It is now in the hands of EPC-CCE (B. Todd) for a global analysis in collaboration with CO-HT. Hopefully a solution will be found and implemented quickly as it impacts significantly on the LEIR beam quality and reliability.

It was also noticed that the LSA DB, for instance trims on high level parameters, modify our "bare machine" by driving/reactivating elements are not suppose to pulse in this mode. Investigations are on-going together with the LSA specialists.

This morning was mainly devoted to the TFB tuning.

TI (P. Sollander)

Last week, an electrical glitch perturbed again the PSB operation. In addition there was a stop of the cooling water station in the East Area and early yesterday morning (25 August) the Meyrin filters and compensator tripped. The injectors were stopped during the restart procedure (30 minutes).

K. Cornelis informed that the sensors in the water circuits on the SPS are often showing zero readings. P. Sollander will follow it up together with CV.

3 Schedule Updates

The Injector Schedule (v1.6) is available at

https://espace.cern.ch/be-dep/BEDepartmentalDocuments/BE/2014-injector-schedule_v1.6.pdf

K. Hanke reminded about the SPS DSO test on Wednesday and Thursday (27th and 28th August).

K. Hanke reminded that on the 28th August there will be a half-a-day technical stop and if some equipment has to be consigned the request is under the responsibility of the intervening team. The beam will stop at 06h00, RP survey will start at 07h00 and access is scheduled at 08h00. J. Vollaire informed that RP team will restart the RAMSES server at 07h30. A. Bland informed that starting at 07h30 the following Control System NFS, Boot, Timing, CV and Orbit feedback Servers will be unavailable for around 5 seconds while their network connection is re-cabled:

- CS-CCR-NFS2/NFS3/NFS4/NFS5/NFS6/NFS7
- CS-CCR-FEOP/FE365
- CS-CCR-CTM/CTLOG
- CS-CCR-CV12/CV13
- CS-CCR-VCNTR1
- CS-CCR-OFC.

The intervention is foreseen to end at 07h45.

AOB

C. Mugnier recalled with a presentation the function of the compensator in the CERN site and the correct procedure to restart them. The slides can be found at

<https://espace.cern.ch/be-dep/FOM/Presentations%202014/Forms/AllItems.aspx>

In the slides it was described what are the Static Volt-ampere reactive Compensator (SVC) and their functions as reactive power compensation, harmonic filtering and voltage

stabilization. In addition specific information for TI and the OP teams was given.

In case of problems in the PSB SVC the injector piquet has to be contacted. The PSB SVC is required for PSB operation. Operation without SVC could exceptionally be possible for a few hours, but results in unacceptable power quality of the Meyrin Network (disturbance of sensitive loads and risk of equipment damage elsewhere in the network). It could also lead to the overload of 70 MVA transformer and black-out of Meyrin network. In case of very major SVC problems, under exceptional circumstances, the second line piquet can decide to operate the Booster main converters without compensator or Meyrin filters.

Similarly for the SPS the injectors piquet has to be contacted in case of problem with the BEF4.

The SVC BEQ2 and BEQ3 are required for SPS operation. Without SVC, the ripple in the SPS converters is too high and the power supply works out of their specifications.

In case of problem on the SVC, until the 30 August the EPC piquet has to be called during the working hours (call the first line outside of the working hours). After the 1st September the piquet to be called is the first line.

P. Sollander asked if there is a list of device that OP team has to stop before stopping one SVC. After discussion between P. Sollander, R. Steerenberg and C. Mugnier it was agreed that a clarification is needed.

C. Mugnier recalled with a presentation the different piquets organized by EPC. The slides can be found at

<https://espace.cern.ch/be-dep/FOM/Presentations%202014/Forms/AllItems.aspx>

In 2014 three different piquet services organized by EPC are available on the CERN site depending of the location and functionality of the hardware to repair.

1. LHC piquet serves the LHC machine and the related experimental areas.
2. EA piquet (also known as first line) serves the SPS machine and the all injector complex experimental areas.
3. Injector piquet serves all injector machines but the SPS.

These piquets provide 24/7 support for the OP.

K. Hanke asked why on Monday early morning the injector piquet could not be reached. C. Mugnier answer that it was due to a technical problem (the piquet mobile phone was not working and now it has been exchanged).

In addition to these piquets there are three support teams (second lines) that can help solving the different issues:

1. Main event support
2. Control support
3. Electromechanical support.

They are called directly by the piquet and not by the CCC.

M. Gourber-Pace commented that for the moment the Control support can be called directly by the CCC. C. Mugnier confirmed it but explained that this modality is supposed to be in place only during this starting-up period and not during LHC physics period.

The next FOM meeting will be held on the 2th September. The agenda will be communicated in due time.

Minutes edited by G. Sterbini.