

# Minutes of the 23<sup>rd</sup> FOM meeting held on 09.09.2014

Agenda:

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

## 1 Follow-up of the last meeting

The minutes of the 22<sup>nd</sup> FOM meeting were approved.

### *Pending actions:*

There were two open actions.

DGS-RP was requested to report on the problem of radiation alarms in the East Area. Helmut Vincke will present the issue in the AOB section. The action was closed.

There was an action concerning the bad reading of the temperature sensors in the SPS water circuit. P. Sollander reported that the problem was solved. The action was closed.

## 2 Status of the Machines

### Linac2 (D. Kuchler)

On Wednesday a source flash over closed the valve LI.VVS10.

On Thursday the LTB.BHZ40 went in fault. The regulation card had to be replaced (1 h 18 downtime).

On Friday a pressure rise in the LT line was detected. It was related to the increased losses during the timing problems in the morning.

On Monday the watchdog was triggering without obvious reasons. B. Mikulec commented that it was related to a timing problem in the PSB.

Since Friday the flash over rate increased significantly.

On Monday maintenance work on the Linac2 PAD took place. The Linac2 team was not informed and the intervening team was not aware of the radiation risk in the cage. R. Steerenberg explained that the intervention of the access point should be performed during the non-access periods. The new access control and safety system is now equipped with a maintenance mode. This means that an extra door that is normally always open can be closed and interlocked with the system. The system will take this door into account after turning a dedicated key in the local electronics racks. Once this door, which is situated between the PAD/MAD and the actual zone, is activated the PAD and MAD are no longer EIS.A and can

thus be manipulated in order to perform the maintenance. Nevertheless this kind of intervention has to be announced but was not the case.

B. Mikulec added that this intervention should be planned and announced at the FOM. An action has been opened for DGS-RP and GS-ASE.

Helmut Vincke will check the radiation dose measured by monitor close to that area during yesterday to estimate the doses received by the intervening team.

### PSB (B. Mikulec)

It was a quiet week for the PSB.

There were recurring problems throughout the week with the transverse feedback on Ring 4, later also with Ring 3 (water flow issue). The installed flow sensors seem not very reliable. EN-CV (A. Dridi) and BE-RF are looking into replacement options.

In the beginning of the week, the Q-strips were found off twice with some detrimental effect on the intensity on higher-intensity users. We informed the MD users how to use the PPM on/off control of the Q-strips.

A. Findlay managed, with very delicate adjustments, to provide 400E10 also for Ring 4 for the SFTPRO h2 beam. The reason of this special treatment for the h2 beam in Ring 4 has yet to be understood.

Also for h1 cycles the intensity limit on Ring 4 is not yet solved. This affects ISOLDE beams, but can be in most cases compensate with the other rings.

On Wednesday before 22h00 the BR2.C04 and the Meyrin compensators tripped. The PSB MPS had to be switched off. The filters were back at 23h24, but then the TFB of Ring 4 had to be reset locally and the RF specialist solved the cavity problem (related to the 7V DC tuning power supply). Beam was back at 01h00 (3h downtime).

On Thursday early morning, the LTB.BHZ40 was in error. As it could not be reset, the EPC piquet was called, but his phone was not available (like for Monday 25/08 early morning and Thursday 28/08 evening). C. Mugnier could be reached at home, and he proposed that the piquet First Line should be contacted instead. First Line changed the 15 V regulation card and beam was back at 07h31. It seems that there is a phone coverage issue with certain piquets due to their home location. An action as been open for TE-EPC.

On Friday there were serious timing problems that occurred after a reboot of cfv-361-ctinj before lunchtime. There seems to be a bug in FESA3 when a non-PPM device becomes PPM. I. Kozsar had to clean up the frontend and the settings had to be driven to all users. The pressure increase in LT and the radiation alarm at 12h45 was probably related to this problem. Beam was back at 13h15 and pressure start to go slowly back to the nominal value.

On Monday morning there were again timing problems at ejection and injection, triggering

the extraction BIC and the injection watchdog for the user SFTPRO h2. After some investigations it was discovered that the drive on Friday was only done for operational beams and it was then repeated also for MD and test cycles, which solved the problem.

On Monday morning the IT network disconnection tests took place. Beams continued to be delivered, but some minor disturbances occurred with applications or consoles.

In the afternoon the C16 cavities tripped (air flow problem). M. Haase exchanged a 48 V power supply, which solved the problem for Rings 1 and 3. Ring 4 remained with a filament error. Once this was solved, the 800 V screen voltage went down and a fuse had to be exchanged (2 h downtime).

Improvements were done throughout the week to increase the injection efficiency and in general the intensity. The setting up of LHC50 has started and another cycle was coarsely adapted for the PS to set up the basic RF parameters for h9 LHC beams.

### ISOLDE (M.-L. Lozano Benito)

It was a difficult week.

**GPS:** On Tuesday, GLM and GHM collections and IDS beam tuning (50 kV) took place during the day.

On Wednesday a proton scan on the converter (80Ga, 76Ga and 140Cs) was done. The lasers were set up for Ga and yields were checked. During the target yield checks it was noticed that the target production was lower than expected. Users took the beam and confirmed the low production. The users called during the night to try to increase the target production by moving the proton beam and the operation was done with the engineer in charge on the phone but no production increase was noticed.

On Thursday the target team takes over to investigate the target yield by making a proton scan. Users called because the beam shape was not optimized. It was notice that after setting the oven 1 current to 25 A the amount of total beam coming out from the target had increased up to 3.5  $\mu$ A. After some investigations it was clear that some of the heating power applied to the mass marker went into the Rb dispenser flooding the ion source with Rb. With that huge amount of beam coming out of the target it was impossible to keep the HT on with protons on target. It was then decided to leave the target hot during the night to try to decrease the Rb level.

On Friday the total amount of beam coming out from the target had decreased of about 50%. The beam shape was still poor but the machine was retuned and transmission to IDS checked. The HT was only holding at very low protons per pulse but beam was delivered again to IDS. The experiment confirms that the data taking was not possible in those conditions.

On Sunday it was decided to replace the GPS target with an old, already used, target.

Since yesterday morning (9 September) and after target change the machine is running fine. During the disconnection test there were several problems hampering the operation (phone book, elogbook and working set availability).

There were some HT trips when proton beam was higher than 1.2  $\mu\text{A}$  and some problems with the GPS deflector plate movement.

**HRS:** There was no physics scheduled for this week on HRS. A target change took place on Friday.

During some cycling magnets tests, one of the separator magnets stopped working. Experts intervened during the week and the weekend and although they have not found yet the way to solve the problem they have a temporary solution for fixing it.

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

There was no physics on GPS until yesterday due to a problem with the target. These kinds of problem are related to the lack of manpower in the target team. M. Kowalska thanks all people involved in the target change and the magnet specialists working on HRS.

### [PS \(G. Métral\)](#)

During the week the TOF, AD and East beams were delivered. The problem of high radiation T9 was understood and solved by selecting the negative secondaries instead of the positive ones.

There was no major problem on the PS impacting the beam production. The commissioning of the LHC25 and LHC50 beam is on going.

Unfortunately a second horizontal wire scanner broke. The wire scanner 54H and 68H has to be replaced and the intervention will take one day. Three weeks will be needed to re-establish the vacuum condition for the ions. Without wire scanners and the kickers 13 and 21 the commissioning of the MTE beam had to stop.

In parallel to the beam production some MD related to e-cloud were carried out. The investigations on the reproducibility of the PS magnetic field are continuing.

### [East Area \(S. Mataguez\)](#)

The physics run is proceeding well. There was a trigger problem on East1 but rapidly solved. By selecting the negative secondaries the beam losses were significantly reduced and consequently the radiation alarm issue was solved.

Next week there will be the physics run dedicated to the schools. S. Mataguez asked to have spill intensity of  $25 \times 10^{10}$  protons. R. Steerenberg commented that the requested intensity can be produced using the nominal beam control system for EAST beams.

### [nToF \(S. Montesano\)](#)

The commissioning of the physics is progressing. The next measurement campaign will be the background calibration.

All services are now available.

### [East Area Users \(\)](#)

No news.

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

During the week a lot of time was spent trying to establish good orbits at low energy using orbit data with corrupted pickup calibrations. L. Soby found and solved the problem (a factor two in the calibration). Correct polarities for the e-cooling orbit correctors were then finally established using correct pickup calibration.

Some problems with programming of the C02 RF caused frequent trips.

Good emittances at 100 MeV/c were seen for the first time on Thursday evening.

There were timing problems for extraction on Friday but timing experts were working on the PSB and PS and could not intervene. In the same day the basic RF set-up and debugging for extraction was done. Large fluctuations in e-cooling performance were observed possibly due to the not ideal alignment of the electron beam.

The weekend was spent on further tuning for reduction of losses and improvement of emittances after re-adjusting the electron beam. On Sunday a very good emittance was measured for the first time at 100 MeV.

On Monday the OP team tried to solve the timing issues and continue with the extraction optimization but the disconnection test blocked a lot of workstations.

The next step will be the setup of the extraction beam line to deliver beam as soon as possible to the users.

### [AD Users \(\)](#)

No news.

### [SPS \(Y. Papaphilippou\)](#)

The week was dedicated on solving several problems with the main power converters (PC), including an electrical fault in one of the 18 kV busbar connector and the implementation of the new MAM card for the power converter output current acquisition. There were also a lot of issues solved with missing cables that had to be pulled (mainly BLMs, vacuum pumps in LSS1) and with the kicker conditioning.

The over-temperature magnet trips that were observed last weekend were found to be due to a malfunctioning water valve that was not regulating correctly the temperature in BA3 (output temperature of 50 deg instead of around 40). The valve was repaired on Monday, thus fully solving the problem.

On Tuesday early morning and after a night of pulsing the power convertors, the mains tripped with several faults including a non-resettable busbar fault. After investigation of TE-EPC and EN-EL, the trip appeared to be due to an 18 kV faulty connector. The investigation continued during Tuesday in order to check the busbar connectors in all 18 kV stations and repair the fault. At the same time, a faulty temperature sensor on one transformer of SMD10 was changed. K. Cornelis and B. Mikulec commented that these checks should be done during the hardware-commissioning tests.

On Wednesday the machine was accessed by several teams for solving mainly cable issues, including BLMs and vacuum valves in LSS1, which enabled the start of the MKP conditioning on Thursday morning. Some supplementary BLM issues have to be solved during next week.

On Thursday afternoon, the FGC card for the power converter current acquisitions was put in operation. This enabled the calibration of the mains and quadrupoles and the start of the compensation of the current in the different cycles from Friday and during the weekend.

During Friday night, there were trips of the mains and quads followed by faults on the mains application. After having called the First Line and investigation of the specialist, it was found that the version of the process running on the crate was not the one compatible to the new MAM card. The specialist restarted the process manually recovering the current acquisition. It should be also noted that the application was showing false faults on several SMDs without tripping the power convertors.

On Saturday night and after several trips of the QD power convertor, the First Line was called to investigate a fuse fault that ended up to be a burned power resistor, that has to be repaired next week. The pulsing continued using the spare power convertor, although it was difficult to change configuration due to the present interlock logic and the experts need still to investigate next week if this is well adapted.

On Sunday, the RF power piquet was called for faults on cavities 1-2-4. Cavities 2 and 4 remained on fault after the local resets (PLC was not responding) and the RF control specialist worked on the problem on Monday.

On Monday an important water leak was discovered in the busbar cable (a 40 year old cable). There is no spare but an alternative solution was proposed. EN-EL announced that the intervention will take six working days therefore SPS is expected to take beam week 38. B. Mikulec asked if there is the risk for similar problems due to the aging of the busbar cables. Y. Papaphilippou answered that there is an action plan in preparation for that. K. Cornelis commented that, due the SPS delay, it would be important to plan the wire scanner replacement in the PS in the shadow of the SPS busbar intervention.

## North Area ()

No news.

## CTF3 ()

No news.

## TI (P. Sollander)

There were no relevant news to report.

## IONS

### Linac3 (D. Kuchler)

On Tuesday the pepper pot was removed due to a vacuum leak in the cooling circuit.

On Wednesday beam was back in the morning but the machine had to be stopped during the night due to another problem with the RF cooling water station (regulation card).

On Thursday the RF was restarted (water station fixed during night) but there was a problem to restart the RFQ due to blocked valve.

Monday was devoted to MD (LEBT gas injection test) and to test the RF FESA class.

The source shows increasing HT drain current (main insulation gets metalized). B. Mikulec asked if the intervention on the source planned on week 45 could be anticipated if needed. D. Kuchler informed that the new hardware should have been delivered during LS1 but is still in preparation at the main workshop, so the replacement cannot be done at the moment.

### LEIR (S. Pasinelli)

During the week the beam was sent to the PS and LEIR injection was optimized.

On Tuesday the problem with the extraction kicker timing (EEX-SKFA-TIM) was fixed by the timing and kicker specialists. Due to the Linac3 water leak on the pepper pots there was no beam until Wednesday morning.

On Wednesday, due to Linac3 water leak in the night, the beam was back only on Thursday morning.

On Thursday the gateway of the central timing crashed.

During all the week the operation were hampered by the ripple on the main quads at the injection current.

D. Manglunki informed that the LEIR platform has been re-opened and acknowledged the RP team.

## PS (G. Métral)

The automatic steering at the injection has been performed and beam is extracted on D3.

D. Manglunki asked about the ion beam intensity. G. Métral answered that the beam current transformers need still to be calibrated.

### **3 Schedule Updates**

The Injector Schedule (v1.7) is available at

[https://espace.cern.ch/be-dep/BEDepartmentalDocuments/BE/Injector\\_Schedule\\_2014.pdf](https://espace.cern.ch/be-dep/BEDepartmentalDocuments/BE/Injector_Schedule_2014.pdf)

With respect to the SPS schedule there will be a delay due to busbar water leak by about one week.

## AOB

Helmut Vincke reported on the problem with the radiation alarm in the East Area. The slides can be found at

[https://espace.cern.ch/be-dep/FOM/Presentations\\_2014/Forms/AllItems.aspx](https://espace.cern.ch/be-dep/FOM/Presentations_2014/Forms/AllItems.aspx)

The alarms on PAXEA10N occurred with a high average beam intensity over the super-cycle. The situation is critical due to the fact the North target is currently the only user of the East Area cycles since the irradiation facilities are not yet operational.

The correctness of measurements was verified by placing a mobile ARCON ionization chamber next to it and the alarm threshold has not been changed compared to 2012. Single cycle with very high intensity does not trigger and alarm since, due to a 100 seconds sliding window algorithm, the relevant quantity is the average beam intensity over the super-cycle (it should be less than  $4e10$  p/s).

It was found that an elevated dose rate levels only occurred when having positive beam in T9. Probably this due to the proton beam lost far more downstream for positive beam but has to be confirmed.

The RP recommendations are:

- To reduce of the average beam intensity over the super-cycle so that there is no RP alarm.
- This can be achieved equally by reducing the intensity per cycle or by limiting the number of cycles per super-cycle. In the long term, the possibility of additional shielding could be investigated.

A. Bland reported on the Technical Network disconnection test. The slides can be found at



<https://espace.cern.ch/be-dep/FOM/Presentations 2014/Forms/AllItems.aspx>

Two new Technical Network DHCP servers were installed by IT/CS on the 11 August to allow IP addresses to be obtained by TN equipment when GPN is not available. One of the HP GPN to TN Gateways was replaced by a higher performance Brocade Gateway early Monday 9 September.

The Disconnection Test was foreseen from 09h00 to 11h00 with complete disconnection around 10h30. The complete reconnection was delayed to 11h15 for some extra checks.

The new Brocade Gateway worked as expected. The TN DHCP servers allowed Windows and Linux machines to reboot correctly. Windows boot takes 5 min and its login 5 additional minutes, which is still too long.

There were no known problems with the TN servers. AFS had been switched off on most of them after the January 2014 TN Disconnection test.

Many Consoles, probably the ones with AFS activity (e.g. personal login being used) blocked completely when AFS servers were no longer visible (10h30). A similar problem happened in January but was thought to be fixed. Once reconnected at 11h15 all consoles unblocked automatically.

The reboot of Linux consoles and servers generally did not block like in January. After a reboot, while disconnected from AFS, the consoles functioned correctly because AFS is switched off. However another reboot is needed after reconnection to get AFS working again.

M. Lamont informed that that was the last disconnection test with machines in operation.

E. Piselli reported on the wire scanner problem in the PS. The slides can be found at

<https://espace.cern.ch/be-dep/FOM/Presentations 2014/Forms/AllItems.aspx>

The wire scanners 54H and 68H broke on the 1 and 2 September.

The exact time of the breakage can be obtained from the TIMBER logs. The motion of the wire on the last scan before the breakage did not show anomalies.

The investigation gave the following result:

- both wires are broken and the forks are not damaged (inspection by access the PS tunnel and visual inspection from the window of the wire scanner tank)
- one power supply was broken and replaced (68H)
- all the recorded data show conformity
- the hardware for the scanners 54 and 68 is largely independent.

The breakage of two scanners within 24 h is a very exceptional event since there was no

breakage of a wire in the PS with the actual control electronics.

There are not many more means to investigate the cause of the breakage for the moment. It was recommended not to do parallel scans or scans separated by less than 10 s. G. Métral commented that the 10 s recommendation is difficult to follow during operation. It was decided not to use the wire scanner during MDs or, if needed, to ask the permission to the shift leader. H. Bartosik will inform the MD users.

Both wire scanners are outside the switchyard therefore the PSB can continue beam production during the replacement. It was proposed to replace them on Monday 15 September if the calibration can be done before Sunday 14 September. The system will be commissioned in week 39. The pure mechanical installation of the single wire scanner takes 1 hour. J.-A. Ferreira Somoza commented that during the LS1 the installation of one wire had to be repeated three times due to vacuum leak problems.<sup>1</sup>

M. Kowalska asked if the supercycle will be modified. R. Steerenberg answered that, depending on the East Area requests, there could be minor modifications.

A. Bland asked to add the three 'red days' (5th, 6th and 7th January) for CO maintenance on the 2015 schedule.

D. Manglunki asked to M. Lamont if the schedule for the ion physics in 2015 has been defined. M. Lamont answered that is still under discussion.

The next FOM meeting will be held on the 16 September. The agenda will be communicated in due time.

Minutes edited by G. Sterbini.

---

<sup>1</sup> After the FOM it was decided that the intervention will take place probably on Tuesday (16 September), to be confirmed on Monday (15 September).