

# Minutes of the 24<sup>th</sup> FOM meeting held on 16.09.2014

Agenda:

- 1) Follow-up of open actions
- 2) Status of the Machines
- 3) Schedule Updates
- 4) AOB

## 1 Follow-up of the last meeting

The minutes of the 23<sup>rd</sup> FOM meeting were approved.

### **Pending actions:**

- *Scheduling of PAD/MAD maintenance work:* D. Küchler reported at the last FOM that there has been PAD/MAD maintenance work at Linac2 during beam operation, which was not announced beforehand to the Linac2 team. Moreover at this location elevated radiation levels have recently been measured, and maybe the access team was not aware of this situation. Another concern was that during maintenance it might be difficult to enter the machine in case of urgent operational problems. Therefore it was proposed that in the future access door maintenance work should be announced at the FOM (where there are always RP representatives). R. Nunes replied in an email that the access team is going to prepare a procedure for the use of the maintenance mode. An agreement of RP should be obtained for each area. The activity will be announced with an IMPACT (or equivalent) and the FOM informed. J. Vollaire replied to the concern of the Linac2 higher dose rates at the location of the new PAD/MAD that RP are going to investigate further this special case, but that it might be required to do maintenance for this PAD/MAD during beam-off periods to avoid unnecessary exposure of the personnel. D. Chapuis stated that it was always foreseen to do maintenance work during beam operation to avoid disturbing accesses during stops. He added that the Linac2 team had not been informed, but the CCC operators were (PS elogbook entry Monday 8<sup>th</sup> of September). A procedure to enter and exit the maintenance mode is under preparation and it is clear that quick exit is important in case of urgent access requests ('quick' will still be of the order of 30 minutes). The aim is also to concentrate the maintenance within a short period (parallel work of several people).

D. Chapuis requested the following maintenances at this FOM:

- EAST zone: tomorrow (whole day). Finally the EA1 maintenance request could be removed after the meeting. As there will be a PS access tomorrow, the interventions can be done in access mode.
- PS Ring Access Point YEA01.PSR=152 (old point D102). Thursday 09h00-17h00 / Friday 09h00-17h00: Maintenance Access Keys.

This has been approved by the FOM and RP (there will also be in parallel PS and SPS machine stop tomorrow).

**Action closed**, but the procedure should be circulated once available.

- *Difficulties of reaching the TE-EPC piquet:* C. Mugnier explained that it is not really understood why the piquet EPC cannot be reached sometimes. The piquet phone has already been exchanged, and it could be that the reason is rather a problem of network coverage. TE-EPC will closely follow this up. In the meanwhile the following procedure should be adopted in case 16 0391 is not reachable:
    1. Go to the EPC site: <https://te-dep-epc-databases.web.cern.ch/te-dep-epc-databases/default.aspx>.
    2. Try to call one of the two persons of the piquet injectors by their own CERN mobile.
    3. If despite this, it is not possible to reach the injector piquet, try to contact the piquet FSU (“First Line”); they will do their best to respond to the problem.
    4. As a last resort, call the Major piquet. (Normally, the Major should be contacted by one of the 3 EPC piquets in case of major problem).  
The same procedure applies as well if one cannot reach the piquet FSU (try to contact the piquet injectors and as last resort the Major piquet).
- R. Scrivens added that last Friday morning there was a problem with the Sunrise 4G network; outgoing calls were possible, but calls couldn’t be received. Outages like that can also happen.
- Action closed.**

## 2 Status of the Machines

### Linac2 (R. Scrivens)

Over the weekend the tube of the RF debuncher was starting to degrade, but the beam was giving enough power to be able to continue operation. On Monday the tube was exchanged.

Otherwise smooth operation with only minor issues.

### PSB (J. Tan)

Tuesday: In the morning there was no beam for 12 min due to a reload of the MTG.

Wednesday: In the morning, a wrong action from the EAST zone alveole perturbed the PSB extraction line: BE extraction kicker timing errors and BT.BHZ10 down. The beam in the PSB was inhibited to stop beam loss. Downtime: 22 min. BR1.C16 tripped during the night. The operator went locally and touched the flow meter (Eletta): the interlock disappeared.

Thursday: The RF piquet came and adjusted the flow meter. The vacuum piquet was called for an alarm on BT2.VRPA11A. He diagnosed a communication issue and will follow this up. When the PS asked for low-intensity SFTPRO beams, the shavers are used on purpose. The PIPO was called for the ring4 shaver, horizontal

plane. He came in and fixed a timing problem.

Friday: In the afternoon, the PIPO was again called for the shavers. It affected EAST beams (intensity fluctuations). The issue was fixed after replacement of a controls board.

Calm weekend.

Monday: In the shadow of the Linac2 RF intervention, intervention of the BI specialist on BI.BPM10 (replacement of a faulty cable).

Beams:

- ISOLDE : more than 3000E10 p with balanced bunches
- SFTPRO2: 500E10 p in all rings but ring4 (450E10)
- LHC beams (25/50ns) available, but still some fine-tuning required.

### [ISOLDE \(P. Fernier\)](#)

**GPS:**

Target #509 UC2C – run @50kV. Users: GLM, GHM, IDS in line RC4. Isotopes: 56Mn, 57Mn, 59Mn, 64Mn, 66Mn, 68Mn, 83Rb.

Proton scan on converter from the target and beam for the physicists. The collections ended on Saturday at 14:00.

Problems: The target heating stopped 7 times; stop of the high voltage; stop of the front-end controlling the high voltage. It is suspected that these stops are due to high-voltage breakdown; a thyatron broke and had to be exchanged.

**HRS:**

Setting up of the beam until the line LA1 and optimization of the transmission using a new application.

Problems: The separator MAG60 did not work correctly and needed several interventions (communication problems between the teslameter and the front-end computer). Therefore the MAG60 current had to be manually adjusted. Monday morning an Ethernet/GPIB interface box connected to the teslameter was exchanged, which solved the problem.

Users lost some time due to the above-mentioned issues.

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

Happy users despite of the problems. Proton availability was very good.

The lost physics program from last week could almost be recuperated for GPS.

HRS: Despite of magnet problems happy users, although they could not complete their measurement program.

### PS (J. Wozniak)

It was a good week for the PS with only several short interruptions. The beams were delivered as expected to AD, nTOF, EAST and at the end of the week, finally, SPS.

Wednesday: Beam stop of 2.5 hours due to a wrong manipulation on a door in the EAST area. The time could finally also be used by the SPS for an intervention at a quadrupole in the TT10 line.

End of the week was rather quiet with erratic problems coming from cavities that had to be restarted, QKE25 & QKE73 pulsing at wrong values (TE-EPC-CO piquet called, Daniel Calcoen working on changing the FESA class) and radiation alarms in the AD zone.

Friday night the SPS took its first beam.

Saturday 4pm problems were discovered with F16.BHZ377, where the piquet team discovered an earth problem and a short circuit. The intervention for this magnet took around 6h from the beam time.

On Sunday night there was a power supply problem on PR.WFNI, which resulted in no beam for all users for ~3.5 hours. Finally the repair was not successful and the spare had to be used.

K. Hanke asked about the duration of the wire scanner intervention. R. Steerenberg explained that V. Donate had requested a 1h cool-down time. Venting will take about 0.5h. Each wire scanner replacement will last about 1h followed by leak detection. Septum57 is in the same vacuum sector, so care will be taken to steadily flush it with nitrogen. The restart time depends on the pressure and the presence/non-presence of a leak, but the intervention will last for sure the whole day. The exact time for the beam stop still needs to be confirmed (lock-out of equipment to be organized), but it will be tomorrow morning.

S. Gilardoni added that the kicker intervention required for MTE operation will be longer than the previously assumed 3 weeks, but he is waiting for the final information concerning the duration of the repair. Remark: After the meeting B. Goddard provided this information in an email: 'The dis-assembly and re-assembly

of these complicated devices in-situ has proved to be a lot more difficult and time-consuming than we initially expected, and is the reason that the repair will not be finished until around 10th October.'

### East Area (L. Gatignon)

The EAST Area has been operating in good and stable conditions.

During the week COMPASS was running smoothly in T10, and the T9 beam was dedicated to the "Beamline for Schools" project.

Their run has been going well so far and the calorimeter constructed by the Dutch team has been tested and calibrated successfully. The physics measurement proposed by the Greek team is progressing with lots of data collected. The background conditions are harsh, as anticipated, and the students have to work hard to improve the signal to background ratio.

The only issue during the week was a failure of the change of the North target head, which was very quickly fixed by the expert. When the so-called hadron target was put in place, the rates in T10 dropped significantly. At some convenient time a detailed study of the target positioning and beam steering has to be organised with the relevant experts.

On Wednesday 17<sup>th</sup> a preparatory test for the IRRAD and CHARM DSO tests (later next week) will be performed in the afternoon.

### East Area Users (H. Wilkens)

Nothing to add to the EAST Area report.

### nToF (M. Calviani)

The facility is operating fine. Commissioning is ongoing with phases of beam on and off...

### CTF3 ()

No report.

### AD (T. Eriksson)

Last Tuesday: Alignment of pbar-e beams at low energy for e-cooling after orbit corrections. Wrong calibration factors were found, and finally the bumps were almost local after correction.

Problems were faced with the ejection timings. On Wednesday the issue was identified and attributed to a RF problem; one of the frequency modules was replaced, which resulted in a frequency error of a factor 10. After correction the extraction was finally working and beam was seen on the first BASE detector.

Thursday: Continuation of the setting up of the ejection line. It was realised that there were no more buttons to control the beam stoppers locally for ALPHA and ASACUSA, which could be a problem in the future for their running efficiency. It was also discovered that there were several cabling errors on correctors and quads in the ejection line, probably a side-effect of ELENA construction work; also cabling teams have been using some obsolete cablotheque names. Nevertheless finally beam was seen on ATRAP1, AEGIS and at the end of DE0.

On Friday the ejection line transformer TFA7049 didn't work (fixed on Monday). It was also discovered that the dipole correctors couldn't be set to negative values (FGCs), which has been reported to CO.

Saturday the setting-up of the beam lines continued. ASACUSA people forced an access door. There were problems resetting this door after the search; the access team will follow up the access right problem.

It was impossible to get past the first beam stopper DE5.STP27 where the beam was lost; on Monday the line was opened and the correct IN/OUT movement was verified; in this context a screen was found clearly misaligned (realigned by T. Dobers).

ALPHA and ASACUSA started taking some beam on Sunday.

Today beam was seen at the end of the new BASE line after extended scans and higher than nominal current in DE5.BHZ25.

T. Eriksson will announce the official start of physics as of today at the user meeting. He mentioned that the machine needs some further tuning. In particular the stochastic cooling is still weak and there are some fluctuations in the beam lines. The electron cooler seems to drop out due to overcurrent protection and there are fluctuations of the production yield.

AD received the first ASACUSA report stating that the longitudinal emittance seemed to be 3x larger than usual. To be followed up.

K. Hanke asked how much of the cabling issues could have been avoided by thorough hardware checkout. T. Eriksson replied that for certain problems beam was needed to verify.

S. Pasinelli reported some problems with the central timing (RDA2/RDA3 incompatibilities of some clients); CO has to redeploy the affected class.

### AD Users (H. Wilkens)

ASACUSA did not suffer too much, as they were facing problems with their own setup, but ALPHA was less happy. The ACE experiment was approved and will run at the end of the year.

Currently there is a difference of around 10 days compared to the last schedule; therefore the physics program must be adapted.

### SPS (K. Cornelis)

The main issue during the past week was the replacement of a water-cooled cable, feeding the QD circuit in BA3. The cable was replaced by two warm cables (400 mm<sup>2</sup> each). The work took three full days, from Wednesday to Friday evening. Thanks to all the involved people also working through Jeune Genevois! On Friday the preparation of the SPS to take beam was resumed. Several hours were lost trying to undo the different safety modifications in the main power convertors (ground rods, door switches, stop buttons), which were implemented to allow the work on the cable. The First Line intervention team was not instructed on these procedures and all the experts were gone.

Unfortunately there was a spark on the MKD just before the SPS was ready, and the kicker had to be reconditioned.

Finally beam could be taken at around 4 a.m. on Saturday morning. The Fixed Target beam went immediately down TT10, and it was not too difficult to make it circulate in the SPS. With the help of T. Bohl it was possible to capture and accelerate the FT beam on Saturday.

On Sunday the 25 ns beam, 12 bunches, was injected and accelerated, again with the excellent help of RF experts.

On Monday work was done on the BPMs in order to get the best quality data for the beam-based alignment. Orbit measurements for Q20/26 are on the plan today with the aim to do beam-based alignment tomorrow.

There are some problems with late FESA classes.

### Linac3 (R. Scrivens)

Stable operation.

### LEIR (M. Bodendorfer)

LEIR receives stable beam with <10% fluctuation from Linac3.

Tuesday: Ongoing investigations about ripple on the main quadrupole power supplies. M. Magrans discovered that the frontend of ER.QDN2040 is repeatedly down and needs replacing.

Saturday: The Low Level Digital RF server crashed. Resetting the server brought back beam in LEIR. This server has been exchanged in August. The new server is under close surveillance to see whether it features a higher level of runtime stability compared to the old server.

Sunday: Extracted beam intensity is stable at  $\sim 0.9E10$  charges with a standard deviation around 15%, to be compared to the standard deviation of <10% from Linac3.

Monday: The Low Level Digital RF server crashed again. Rebooting brought back ion beam in LEIR. ETP.BCT is not showing any current, although the PS confirms the reception of  $0.4E10$  charges per bunch. Strong ripples can be observed on OASIS for ER.BHN. This was seen beforehand and it was linked to a non-reproducible machine behavior.

During the night from Monday to Tuesday the RF capture was not working, and a restart of the respective server didn't help. To be followed up.

Until yesterday only  $\sim 1/3$  of the injected beam is delivered to the PS (hierarchy problem). The plan for this week is to reconfigure LEIR from the bare machine in order to obtain a working control system hierarchy.

### PS with ions (J. Wozniak)

Nothing particular to add.

D. Manglunki inquired whether it was possible to measure the Ar beam intensity before the wire scanner intervention. S. Gilardoni replied that this would be done. R. Steerenberg mentioned issues with the baseline. S. Gilardoni replied that several measurements should be acquired and then the baseline subtracted offline, which should give a valid measurement.

### TI (R. Van Der Kolk)



R. Van Der Kolk informed the FOM about an intervention on the emergency switchboard ME59 planned for Friday (the 'note de coupure' has been sent around). This intervention also affects the access system nTOF TT2/TT2A, but it was thought during the meeting that it should not be a problem for the maintenance tests. After the meeting it has been clarified that no access would be possible during a couple of hours for nTOF (the UPS batteries last only 1-2 hours), but this was accepted by the nTOF team.

### 3 Schedule Updates

K. Hanke presented the Injector Schedule (v1.7). It can be found 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)

Changes compared to schedule: First beam to SPS on Saturday early morning instead of Thursday and first beam for AD physics today. B. Mikulec asked if M. Lamont could occasionally update the schedule for future reference.

The planned machine stop for the PS (wire scanner intervention) and SPS (beam-based magnet alignment) will most probably happen tomorrow (see these minutes SPS+PS reports): access will be possible also for other interventions, and after a question of D. McFarlane and S. Mataguez it has been confirmed that IMPACTs are required.

M. Kowalska answered to a question of K. Hanke that ISOLDE would request beam; therefore the PSB will continue running for ISOLDE (no access in the PS switchyard).

#### 3.1 *Presentation 2015 draft startup planning (M. Lamont)*

The 2015 draft schedule has been shown at the research board last week and will stay as draft until December.

Main points for the injectors:

- Controls maintenance 5-7 January.
- Start linacs at 19<sup>th</sup> of January.
- Beam to PSB and PS w5.
- Beam to SPS 2<sup>nd</sup> of February.
- Ar setup for the North Area Ar physics run (6 weeks) starting on the 9<sup>th</sup> of

February.

- 2 weeks of SPS scrubbing run still tbd.
- The 2015 run will end with 4 weeks of LHC ion run on 14<sup>th</sup> of December.

The LHC will start re-commissioning with beam on 9<sup>th</sup> of March.

D. Mcfarlane pointed out that the effective duration of the technical stop is 3 weeks: the week before Christmas and weeks 2+3 in 2015. K. Cornelis reminded that no work should be planned that could affect the beam. D. Mcfarlane said that each intervention request would be examined in this respect and would have to be approved beforehand. D. Manglunki added that vacuum conditions should be maintained for ion operation during the technical stop.

More precisely it was asked what would be the machine status during the technical stop. It was said that it should first be investigated if there were urgent needs for interventions and then decided if machines would be locked out. The status of the infrastructure during this period has still to be clarified.

The planning for the NA physics at the end of 2015 still needs to be discussed.

S. Hancock asked when the first multi-bunch beams would be requested by the LHC. The reply from M. Lamont was approximately in May 2015 (50 and 25 ns beams), but the doublet beam should be tested before to be able to evaluate its effectiveness.

The presentation can be found [here](#).

#### 4 AOB

F. Pirotte informed the FOM that an evacuation exercise would happen for building 363 on the **19<sup>th</sup> of November**. The alarm will be heard in several nearby locations including Linac2/3 and LEIR. Beam will not be affected. The visit service should be informed as well.

S. Deval brought up the question if the TTC2/TDC2 mezzanine CV works could be done during the ion run. The clear reply of H. Vincke was no. The second proposal was that these works were done in 2016 after the proton run plus 4 weeks of cool-down; this should be possible, but should be decided at the IEF, as it would result in ~ a factor of 3 higher dose rate levels for the intervening personnel.

The next FOM meeting will be held on the 23<sup>rd</sup> of September chaired by K. Cornelis. The agenda will be communicated in due time.