

# Minutes of the 19<sup>th</sup> FOM meeting held on 12.08.2014

Agenda:

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

## 1 Follow-up of the last meeting

The minutes of the 18<sup>th</sup> FOM meeting were approved.

### *Pending actions:*

There was an open action for ACCESS and RP: with the new access system, depending on the access modalities, the threshold of a radiation monitor in the Switchyard has to be modified after the access. There is not an automatic procedure to re-establish the threshold and this can produce inconsistencies in the access system. PS-OP requested during the 18<sup>th</sup> FOM (5 August) to make an automatic procedure to ease operation. J. Vollaire explained that investigations are on-going but it is already clear that an automatic procedure cannot be put in place in the short term. He will follow-up the long term solution (several months) and, in the meantime, he informed that special “consignes” are explicitly passed to RP as a countermeasure to alleviate the problem. The action is closed.

## 2 Status of the Machines

### Linac2 (G. Bellodi)

It was a quiet week for the Linac2.

The only issue was related to a radiation monitor (PAXS23) setting off an alarm when ISOLDE was requesting high intensity beams. Since this monitor is at a new location, it is not possible to compare with the past records. The OP team is following this up with RP colleagues and will discuss this week whether any of the alarm thresholds currently used needs to be re-adjusted. K. Hanke and J. Vollaire commented that a re-adjustment of the threshold seems a reasonable solution.

### PSB (A. Findlay)

This week was mainly spent to increase the beam intensity for the users, trying to get stable beam from R4 and starting to set up the splitting for the SFTPRO cycles.

The nominal 400E10 p per ring was reached for the AD user, and there was a copy on the MD3 user to help the PS with their setting-up.

On Wednesday, for no clear reason, these two cycles started triggering the BLMs at the point of extraction (but also further down the line). It was decided to move all 4 rings by about 4 mm in vertical to extract them without triggering the BLMs. C. Bidaut then had to re-steer the beams down to the PS, where PS-OP had to re-adjust their injection. This had to be done for both cycles. The steering greatly reduced the losses in the line.

BTYQFO184 dropped out several times a day taking out the ISOLDE beams. Often only a reset was required, but the First Line was also called to verify the equipment. At one point they made a change in the hardware, but this did not solve the problem. Eventually First Line was asked to investigate with the specialist and after several modifications the device became stable.

The RF controls team delivered the alarms to LASER for both the TFB and the cavities this week, which were tested and were working as expected.

The splitting for  $h=2$  on the SFTPRO2 cycle was started and the code changes made by M. E. Angoletta appear to worked as expected, with about  $250E10$  p split on R3. However before increasing the intensity, the cycle has to be updated with the optimization done after LS1 restart.

The efforts to increase the maximum intensity for ISOLDE continued throughout the week, with  $2600E10$  operational by Friday. R4 continues to present higher losses: there is a problem in the injection trajectory and working point. Investigations will continue during next week.

On Sunday a number of breakdowns stopped the beam, the most time consuming being the BT.QNO10, where the power piquet had to intervene several times on the cooling circuit. After a total of about 2.5 hours the cooling system was operational again and the beam was transferred once more.

A. Findlay reported that the BT.BLM10 (in front of the new dump) is showing a radiation level higher than its threshold and asked to increase its threshold. J. Vollaire commented that the increase of the BLM threshold is acceptable for RP. M. Calviani added that, in any case, it is important to monitor the temperature of the dump.

### [PS \(A. Guerrero\)](#)

It was a busy week for the PS.

On Sunday (10th August) evening a large vacuum leak on SS79 was detected and repaired by the vacuum piquet. A vacuum clamp was broken between an ionic pump and the kicker KFA-79. As it was a large leak a substantial quantity of air and therefore water vapour entered the vacuum sector. The leak was repaired Sunday night and left pumping overnight, a leak detection was carried out early Monday morning and the ion pumps flashed and re-started. P. Demarest added that due to the quantity of water vapour introduced that the pressure would take time to recover to previous levels but the situation was improving.

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On Thursday afternoon the nominal AD beam could finally be delivered with very few losses. A transverse instability developing along the flat top was detected and corrected by increasing the chromaticity. Further measurements showed that the beam was initially situated in a zone of negative chromaticity. One of the suggested possibilities for such a displacement is the current 6 mm beam radial position along the flat-top which still needs to be understood. During the day an access of 2 h was needed to repair a 10 MHz cavity (C81) and, in addition, the beam was down during 1h 30 min due to a problem in an RF crate.

On Friday the nToF intensity could be raised to  $650E10$  ppb with very few losses at transition. Another transverse instability has been detected and should be studied more in detail. The check of the gamma jump quad polarity remains to be done. For the moment a change of the radial position at transition allows the extraction of TOF nominal intensities.

The B measurement with the FMR put in evidence jumps of about 2 Gs at 1100 Gs depending on the preceding cycle. Furthermore the use or not of the PFWs 8-loop on a preceding cycle showed a jump of 7.7 Gs. The acquisition of the B-train does not see any of these jumps. Therefore the two measurements are not consistent and most probably the B-train measurement is wrong.

The recurrent amplitude jumps and frequent resets for KFA21 hampered the operation during the week.

The 1-turn feedback loop has been commissioned for the AD high intensity beam.

The multiple element fast extraction had been commissioned for the current operational beams and works well for the nominal values provided by BE-ABP.

The orbit measurement is now operational. The issue at extraction for beams with harmonic changes has been solved.

### [SPS \(H. Bartosik\)](#)

The EPC tests of the main bending magnets were finished last week. The EPC tests for the quadrupoles will start at the end of this week.

Since Monday a 3-days stop is ongoing for exchanging three faulty magnets (a quadrupole with earth fault, a dipole with water leak and another dipole with vacuum leak) and the high-energy beam dump TIDVG.

The old dump was already moved from BA1 to BA3 and removed from the tunnel. The new beam dump was already lowered to BA3 and is on its way to LSS1. During the transport of the new TIDVG there was an incident where the drainage channels could not support the weight of the trailer carrying the TIDVG. D. Macfarlane explained that the trailer became unstable and there was a risk of rolling, so it has been decided to stop and get floor reinforcement in the form of steel sheets to continue. By now, the new beam dump has reached LSS1 and the works are ongoing according to plan.

### ISOLDE (D. Voulot)

It was the first full week of physics for ISOLDE for both separators: isotope collections on GPS for medical applications and CRIS on HRS.

There were several interruptions this weekend with target trips on GPS and separator problems on GPS and HRS (francium beam). A part from that the machine, including the RFQ cooler, is running.

Tomorrow afternoon (13 August) an intervention is foreseen on the tape station.

There are problems with the GPS target and line heating (work is on going). In addition to that there are steering problem on GPS.

### ISOLDE Users (M. Kowalska)

GPS users are satisfied but there are delays and difficulties for HRS users.

M. Kowalska expressed concern about the maintainability and operability of the control software for the mass generator. The developer of the system, M. Colciago, left CERN and even if the code complies with the CERN standard there is not yet an official support in place. M. Calviani informed that, concerning the FESA class of the system, he would transmit the information to A. Masi.

M. Kowalska asked for 2  $\mu$ A beam intensity during the week. R. Steerenberg answered that the request will be taken into account in the SC composition.

### nToF (S. Montesano)

The issues with vacuum and interlocks problem are solved. Concerning the physics the first detector has been installed and the physics is going to start.

J. Vollaire requested to check the radiation monitor reading with the nominal nToF intensity as soon as possible.

### East Area (S. Mataguez)

No news.

### East Area Users (H. Wilkens)

The EAST1 spill was mostly used by the ATLAS and CMS teams during the week.

### AD (T. Eriksson)

The week was dedicated to the AD setup.

On Tuesday the first beam (300E10 p) was sent to the target with the horn pulsing. The horn is working as expected and the beam went around half of the AD circumference.

On Wednesday circulating beam was established after a polarity change of two new orbit correctors in the ring. The lifetime of the beam is good.

On Thursday there were problems with the RF cavity: system 2 was down and system 1 was giving 170 kV out of the nominal 550 kV. The proton intensity was increased up to 800E10. By temporarily increasing to 1500E10 the RP alarm were triggered in the AD hall. The phase relation of production beam bunches with respect the C10 RF looks stable the stochastic cooling set-up started to be commissioned.

On Friday the C10 system 1 reached the 500 kV, enough to start testing the stochastic cooling.

On Saturday there was much debugging and hardware installation completion and the first observation of stochastic momentum cooling.

At the moment the main items in the to-do list are the setup of C02, the deceleration, the electron cooling set-up and ejection lines commissioning. Progress has been quite slow and the AD-OP team is seriously considering delaying the physics start, which is foreseen for next Tuesday (19 August) on the 26 August. H. Wilkens commented that the experiment will be anyhow ready for the 19 August in case there would be beam available.

### Linac3 (D. Küchler)

After some retuning of source and of the LEBT, Linac3 is delivering around 50 eμA.

The PPM copy of BTC setting is working now as expected.

During the week the FESA class for the slits was upgraded.

The pepper pot installation will not happen this week due to the non-availability of specialists (new date to be discussed with LEIR).

### LEIR (M. E. Angoletta)

There was very good progress this week, which included bringing back to operation many tools such as YASP and that culminated with a beam of  $1E9$  charges being captured, accelerated and synchronized at extraction on Wednesday evening. There are still several issues to be addressed.

One of the more limiting problems consisted of unexplained changes in the machine, so that the beam could not anymore be injected into the machine.

In addition, during the week as well as on the weekend there were several problems with many power converters that got either frozen (and stopped working) or could not be reached by the control interface. The EPC piquet intervened several times and, in addition to solving each time the problem, started to take some diagnostics tests to be submitted to the controls expert.

On Tuesday there was an access by BI to fix the noise problem on ER.MTRF12. A problem with the radial PUs signals passed on to the LLRF was solved, meaning that the radial loop could actually be used. Following this and changes in the preset value of the B-train, a very small intensity beam was captured and accelerated (with phase and radial loops) on most cycles. The beam was lost at injection later on in the evening and nothing could be done to solve the problem.

On Wednesday a problem with the orbit frontend was identified and experts started to work on it. Apart from that, around mid-morning and without actions the transmission line got back to its performance. Beam could once more be reliably captured and accelerated. The extraction reference frequency was changed to match the extraction frequency value and the beam got synchronized. This was extremely satisfactory, even if the beam intensity was pretty low ( $1E9$  charges accelerated and synchronized).

On Thursday the orbit data acquisition problem was solved, thus allowing to measure for the first time the closed orbit with YASP. A suspicious variance was found in the ER.BHN current at injection. Then something changed in the machine at the end of the afternoon and the beam was lost.

On Friday the hypotheses of an unstable magnetic field at injection was confirmed and the day was mostly devoted to try to compensate for eddy currents and to have a flat magnetic field at injection. However, improving the unstable field to make it flat at injection, did not improve neither the injection nor the beam survival in the machine. Reverting all values back to values from the day before (where beam was lost) brought beam back for unexplained reasons.

Over the weekend there were again problems with power converters (EI.BHN10, ER.QFT24, ER.QDN1030, ER.QFT24, ER.SMH11) that sometimes recovered after a reset.

[TI \(P. Sollander\)](#)

No news.

### 3 Schedule Updates

K. Hanke presented the Injector Schedule (v1.6). It can be found at

[https://espace.cern.ch/be-dep/BE/DepartmentalDocuments/BE/2014-injector-schedule\\_v1.6.pdf](https://espace.cern.ch/be-dep/BE/DepartmentalDocuments/BE/2014-injector-schedule_v1.6.pdf)

K. Hanke reminded that, as scheduled, there will be a technical network disconnection test on the 8 September and that there will be a half-day intervention on the 28 August (from 08h00 to 12h30) for an intervention on the Finemet cavities in the PSB.

K. Hanke informed that a 2 h PSB stop has to be scheduled for tests the PSB MPS. After discussion, it was agreed that the injector MD tomorrow morning will end at 14:00 and will be followed by a 2 h stop from 14h00 to 16h00 to do powering tests in the PSB and to give access to nToF.

D. Küchler informed that in week 45 there will be three days without Argon beam. He will contact M. Lamont to ask to update the Injector Schedule. During this stop the plasma chamber of the source has to be replaced.

#### AOB

The next FOM meeting will be held on the 19<sup>th</sup> August. The agenda will be communicated in due time.

Minutes edited by G. Sterbini.