

Minutes of the 22nd FOM meeting held on 02.09.2014

Agenda:

- 1) Follow-up of the last meeting (B. Mikulec)
- 2) Status of the machines
- 3) Schedule (B. Mikulec)
- 4) AOB
- 5) Next agenda

1 Follow-up of the last meeting

After the last meeting, G. Bellodi clarified with J. Lehtinen the nature of the Linac3 problem and he informed her that there was no explanation about what had happened (whether it was a failure of a flowmeter or something else). The minutes were modified accordingly. P. Sollander added that there would be an improved surveillance of Linac3 put in place.

There were no further comments and the minutes of the 21st FOM meeting were approved.

Follow-up from the last FOM:

Pending actions:

Possible revision of the watchdog algorithm in the Linac2 (for DGS-RP from 21st FOM):

- B. Mikulec informed that this topic became an action at the IEFC now. D. Kuchler stressed that the purpose of the watchdog is to protect the machine, not to reduce ambient radiation. H. Vincke objected that this statement does not solve the radiation problem. B. Mikulec reported that R. Scrivens said that a non-ppm watchdog with a single threshold for all users (as proposed by P. Collier in the IEFC) would be very bad in case there is a bad ppm setting (e.g. on a magnet for one specific user): then the watchdog would count down from the threshold when this user is played, but would again be incremented by the next user, meaning that the fault would stay undetected by the watchdog. H. Vincke took note and will inform J. Vollaire.

After the meeting, J. Vollaire sent the following message:

“Maybe one clarification as I was not in the FOM and it seems that my message from last week was interpreted as a claim that the Linac2 watchdog is not responding fast enough to beam losses.

This was not my point, the general message I wanted to pass is that in case of high radiation alarms the operator has to stop the beam of the concerned area promptly. My colleagues had observed a few occurrences in the PS complex (not only L2) where the reaction time was longer than what we were used to before LS1. My point was just to remind the good practice after the long shutdown period.

During the discussion, R. Wegner mentioned that the beam was stopped after a few lost pulses by the watchdog. From the explanation of R. Wegner, I understand that in fact it is a few pulses per users and in that case as all users were lost we saw more pulses (our monitor doesn't distinguish between users while the watchdog does). So I conclude the watchdog worked as expected in that case.

Finally note that we don't consider the watchdog as a safety system, if a risk analysis would lead to the conclusion that an interlock should be used as a mitigation measures we would rely on the interlock function provided by our radiation monitor and the PACS/PASS (SIL certified)."

The action can therefore be closed.

Cooling problem and temperature monitoring in the Linac3 (for EN-CV from 21st FOM):

- P. Sollander discussed with EN-CV and he informed that monitoring would be improved (by adding new sensors). He added that it is important that TI operators are called as soon as a problem with cooling occurs, referring to the problem that occurred 10 days ago on Friday night, and that was found out only on Monday morning because the TI operator was not called. B. Mikulec asked whether the origin of the problem in Linac3 was found out, and P. Sollander answered it is difficult to tell, since only a general fault is returned and it is impossible to trace it further.

Action closed.

Readings of sensors for water circuits in SPS (for EN-CV from 21st FOM):

- P. Sollander said that it is being followed up and one should know more after a meeting on Wednesday on this topic. Action not closed.

2 Status of the machines

Linac2 (D. Kuchler for G. Bellodi):

On Tuesday night, LI.VVS10 closed due to a source flashover. Vacuum specialists did some more checks on Thursday morning and will continue to analyze the situation.

On Thursday morning, a new RF FESA class was deployed. The basic functionality works. LASER interlocks still need to be checked.

On Thursday, RP planned to install the alarm unit on PAXS23, but this had to be delayed to the next technical stop due to lack of manpower.

PSB (B. Mikulec):

On Thursday, all beams were stopped at 6am for the technical stop. RP requested a radiation survey before giving access at 8am. Several interventions took place: BPMs, BCTs, BLMs, external condition recabling for BTY.BVT101, LL-RF recabling (switch to change between old and new beam control), intervention on Finemet cavity, magnet intervention, inspections (vacuum) etc. Beam

should have been back at 12am, but the C16 cavity tripped and was only back at 1pm. Then the MPS, LT.BHZ20 and BT.BHZ10 would not restart. Finally beam was back at 2pm.

After the technical stop, new BI issues came up: BI.BPM10-V and LT.BPM50-H had huge offsets and gain 1 of BT3.BPM00 was not working. In addition a polarity inversion had been introduced on LT.BPM40, LT.BPM50 and LTB.BPM20 (all horizontal). Most of the issues were resolved on Friday afternoon, but for BI.BPM10 an access is required. There was also an acquisition problem on BTY.BCT112 and BTY.BCT325 - the ppm calibrator seems not to work correctly - the BI specialist changed to global calibration mode.

Still on Thursday evening BT.QNO30 tripped several times. The piquet PO was called, but couldn't be reached in the beginning ('the phone is not available'...). Half an hour later he could receive the phone call, came in and fixed a bad contact in an auxiliary power supply. 1h45m beam stop.

Throughout the week the LL-RF specialists were fighting with losses in ring 4 before extraction, in particular for the SFTPRO h2 beam, but it is also difficult to stabilize h1 beams on ring 4. On Friday they observed that the gap relay for Finemet cells 9&10 was not working; when closed there were ~700 V induced. Still they believe that this is not the cause of the ring 4 problems; they will intervene at the next access possibility. On Monday the RF specialist switched on the amplifiers for cells 9&10 to reduce the induced voltage, but no visible change on the beam in ring 4. On Monday the RF specialists found out that ring 4 only gets unstable when the phase between the C02 and C04 cavity approaches 180 deg - to be followed up.

On Friday evening at 8:20pm 3 sector valves closed in the BI/BT vacuum sectors and couldn't be re-opened. The vacuum piquet found a rack being off - he had to exchange a fuse to restart it. Beam was back before 10pm.

On Saturday early morning the distributor on ring 4 tripped. This had announced itself already on Friday. The PSB continued providing beam with the remaining 3 rings before calling the piquet kickers in the morning. Ring 4 was again functional at 10:30am.

On Monday, J.C. Bau renamed the External Condition for the beam stopper LT.STP and moved it from Hard/Soft to the pure Hardware conditions. Now all the requested EC for the beam stoppers are connected hardware-wise.

The INCA release solved the ppm copy issue with a faulty make rule that affected copies of functions with different amplitudes between the 2 cycles.

Beams: ISOLDE, TOF, EAST beams available, LHC25ns beam in good shape. For the SFTPROh2 beam rings 1-3 are available with 400E10 p per ring and nominal longitudinal parameters, ring 4 max. 200E10 p. SFTPRO has been sent to the PS last night.

Concerning the MPS filter problem, B. Mikulec said that it was sufficient if only the MPS of the PSB is stopped when there is an issue with the Meyrin compensators. PS, AD and ATLAS can continue running. C. Mutin confirmed and added that they would continue their study to provide a list of equipment that could be damaged and should be switched off in such a situation. G. Métral asked if one should continue to cut POPS when such a problem occurs, and C. Mutin answered that it should not and that only the PSB MPS should be cut. He added that this was the procedure and this should

not have changed. He informed that a note would be published to clarify this. P. Sollander objected that the written procedure was to stop PS and AD before. C. Mutin took note and stressed that the PSB MPS should be stopped, as it is the one generating the perturbation. P. Sollander asked if an interlock is needed on the PSB and C. Mutin replied that for the moment the perturbation triggers a warning and that an interlock was under discussion.

ISOLDE (P. Fernier):

There were no serious technical problems this week.

HRS: Target #510 UC2C; Run @30kV. Proton scan done on Friday for Rilis tests with ^{26}Na . There were no official users this week: beam for Rilis adjustment (lasers) and pre-tests on the LA1 line for the next experiment; bad vacuum on this experiment needs to be improved (leak on HR.FC690 was repaired).

GPS: Target #463 Pb; Run @30kV for IS588 and 30kV, 20kV, 10kV for Solid State Physics. There were 2 experiments this week on the RC4 line (IS588) and GLM line (Solid State Physics). IS588 took the beam until Sunday 16h00 (after tests of lasers for Rilis Vadis), then machine switched for SSP. On Monday morning there was a target change on GPS and setting-up at 50kV. No tests of the clamps of the front-end happened because C.Mitifiot was absent and potentiometers on the GPS front-end were not replaced.

Next week the full intensity will be taken by GPS and nothing on HRS.

ISOLDE users ()

No news.

PS (G. Métral):

The week was dominated by the issue with KFA21. L. Ducimetière presented the status of the faults (see [slides](#)). The piquet was called for a faulty capacitor in the PFN that was replaced, but another more serious issue (contact weakness due to erosion) was seen during the dismantling. This contact weakness could degrade exponentially into an open circuit and could lead to the pollution of the oil, which would result in weeks of cleaning. As a consequence, it was decided to intervene immediately. The intervention is expected to take about 1 week per PFN, i.e. 3 weeks including the spare (the interventions cannot be done in parallel due to the proximity of the PFNs).

S. Gilardoni asked if it would be needed to intervene also on KFA4. L. Ducimetière answered that it would not be needed since KFA4 has been shown to be weak with respect to flashovers, but that it was a different problem.

B. Mikulec asked when this intervention was planned and L. Ducimetière estimated that it could start by the end of the week.

G. Métral asked if we should wait for the spare PFN to restart the operation of KFA21. L. Ducimetière said that it would be a solution, but that the spare would then obviously be unavailable.

G. Métral then continued with the PS report.

The PS was now set back up to the CT extraction as in 2012, with the dummy septum retracted, stopping all MTE setup studies for the moment. It was decided that the SPS would use the CT extraction for the first weeks of North Area physics in order to let TE-ABT perform the intervention. Once the KFA21 becomes available again, the setting-up of MTE will continue and a date for delivery to the SPS will be decided in due time. K. Cornelis pointed out that SPS had requested anyway a 'dirty' CT for SPS debugging and he is happy to hear that he may have a cleaner CT to start with.

The AD and TOF beams were set up with the standard settings. The TOF beam is more complicated, as it requires 4 synchronized kickers.

S. Gilardoni said that it would be useful to take the opportunity of the intervention to check which PFN would be optimum for the operation of KFA21.

On Tuesday, there was a false fire alarm on POPS due to a problem with a sensor. P. Sollander informed that it was not thought to be a problem with the sensor, but due to works nearby, which triggered the alarm.

On Wednesday, the system to diagnose the Bfield fluctuation at injection was put back in operation.

On Thursday, a cable for the interlock to BHZ377 was found cut during the SPS DSO tests.

A measurement card needed to produce 26 GeV beams was installed and tested.

The bunch is degrading as if there was coupling at low energy, but there is no acquisition on many devices while OASIS is stating that they are functional.

S. Gilardoni informed that a wire scanner was broken on Monday (without beam). L. Soby was not aware and will investigate.

East Area (S. Mataguez):

It was a very good week, with only two to three trips. S. Mataguez thanked the operators for the calibration of BI equipment that led to a very good steering on targets.

East Area Users (H. Wilkens):

Everything is fine.

S. Hancock asked how long the PS extraction to East would stay at low intensity, since it is not comfortable for the RF operational settings and the switch back and forth is not trivial; due to instrumentation it would become impossible to provide an EAST beam at low intensity with a parasitic TOF. S. Mataguez answered a radiation alarm from the primary zone occurs as soon as 30×10^{10} p are reached. The only thing that has changed since last year is the switch from ARCON to a RAMSES radiation monitor. H. Vincke and S. Gilardoni said that the integration time and resolution has then changed. B. Mikulec said that a follow-up from RP is needed: what is the difference with previous years? H. Vincke said that it was not possible to resolve spikes with ARCON. S. Hancock said that arguments to set the thresholds are needed. H. Vincke answered that the legislation imposes the thresholds and that he will ask Joachim to come back next week with a statement from RP on this alarm. S. Mataguez added that since it comes from the primary zone, either the threshold is changed,

either more shielding is added. An action has been opened for RP (J. Vollaire) to come back next week with details on the change of monitoring and the definition of the threshold.

TOF (0):

No news.

AD (0)

T. Eriksson sent the report after the FOM and said that there were some serious issues at AD to deal with.

“A quick recap of the week:

- During the week, some time was lost due to PSB/PS problems
- Adjustments and setting-up + debugging at 300 MeV/c in the beginning of the week (e-cooling, RF capture, orbit corrections but not yet with YASP so very slow..., tunes)
- Unstable conditions observed, so the above was repeated until Thursday when we saw first beams at 100MeV/c with some signs of cooling.
- Thursday evening orbit corrector DR.DHZ2908 failed. Traced to bad/burnt connector on magnet. Repaired Friday morning.
- And then the machine was different again... - re-started orbit corrections and e-cooler beam alignment at 300MeV/c.
- Better orbits at 300 MeV/c obtained Saturday
- Good cooling at 300MeV/c and good deceleration to 100MeV/c obtained Sunday.
- Monday: Orbits at 100 MeV/c are very (too) large, corrections do not work satisfactory and points to a severe horizontal perturbation in the e-cooler region.”

AD users (H. Wilkens):

H. Wilkens said that the orbit was unstable and that the beam needs the e-cooling working, which led to the fact that physics couldn't start as planned and therefore a bad week for AD users.

SPS (V. Kain):

The dump kickers MKDH/V and injection kickers MKP conditioning will not be finished for the 8th of September. And the energy tracking system commissioning can only take place afterwards. The final voltage for MKDV will be 44 kV (more than in 2012: 41 kV, but less than nominal 47 kV), which would give sufficient margin for Q20. The estimate for first beam is for September 12th.

The DSO tests of chain 2,3,4,5 and 1 were successfully carried out on Wednesday and Thursday last week. The DSO signed the beam permit.

It has to be mentioned however, that the DSO test had to be interrupted to provide a missing cable between chain 1 and BHZ377 in TT2. This is supposed to be the consequence of the cabling campaign in LSS1 and TT10.

There are also other problems with cables for ring BLMs and special BLMs in LSS1, which still need a cabling intervention next week.

Despite a large number of accesses during last week for cleaning, RP, BI, vacuum, CV etc, there are still a few remaining tunnel interventions for next week (floor painting, BLMs, etc.).

The main circuits could be pulsed from the control room in different configurations for the first time, which is a big step ahead. The system is however not fully debugged yet. The main circuits still trip after a few hours of operation due to "dV/dt errors", mainly the main quadrupole circuits. Also the acquisition card for the main circuits is not working yet.

The various inputs to the BIS around the ring are being debugged (collimators, BLMs, FEI of mains...). Several issues were already found among the tested inputs. Debugging will continue next week.

K. Cornelis regretted that there is still no current reading for the mains, due to problems with the acquisition cards. He added that the length of the SPS supercycle was set to 29 basic periods after the request at the FOM last week, in agreement with R. Steerenberg. However a supercycle with 22 basic periods is needed for tests for a limited time. K. Cornelis added that the SPS would not play injection cycles and could be disconnected from the rest of the chain during that test.

K. Cornelis also regretted that no control of RF power was available from the CCC, one week away from beam and in cold checkout. T. Bohl said that this is followed up and that quite some progress was achieved yesterday.

North Area ():

No news.

North Area Users ():

No news.

CTF3 ():

No news.

TI (P. Sollander):

IT will upgrade routers and switches on October 29th. All hosts on the technical network will lose the network for (4 min+1 min). B. Mikulec noted that it is scheduled during a technical stop. A. Bland said that the impact on the access system would be much less than before LS1, but it might still affect SPS access, and mostly the CRYO for LHC (as well as maybe CTF3 and Linac4). P. Sollander proposed to schedule the intervention during the radiation cooldown right after the beam stop to minimize the impact on the technical stop. B. Mikulec agreed. P. Sollander will discuss this during the upcoming TIOC.

IONS

Linac3 (D. Kuchler for G. Bellodi):

An RF module was replaced, and on Wednesday the FESA RF classes were renewed. One of the SEM grids could not be moved in and out. On Thursday some beam image was seen on the pepper pot, but it is still a long way to go until a good emittance measurement.

There was a vacuum problem since Friday evening (vacuum fluctuation). It could be due to the pepper pot. The leak detection was done. The beam stopper is needed for 10 min and D. Manglunki agreed. B. Mikulec said that this stop should then be arranged.

LEIR (D. Manglunki)

On Tuesday, F. Blas and team fixed some electronics cards in the transverse feedback. The Ar beam started to be delivered to the PS on Tuesday afternoon, with a usable intensity ($1.5E10$ charges/pulse).

On Wednesday morning, M. Cattin changed all control cables to the main magnet power supplies. Some noise reappeared on one of the power supplies, solved by the TE/EPC piquet.

The beam was stopped on Thursday morning due to the CPS access. This stop was used by EN/STI to access the ETL line inside the PS switchyard, to investigate the feasibility of installing a new beam dump for LEIR in ETL.BHN10.

On Friday morning, LEIR was decoupled again in order to perform the radio protection measurements aimed at deciding whether to reopen the visitors' platform during Argon operations. RP's official reply on this topic is expected before September 5th. On Friday afternoon the extraction transformers were recalibrated by BI, showing practically 100% transmission between LEIR and the PS, but it currently looks like the PS is only injecting half of it.

Beam was stopped yesterday morning until ~16:00 for the Linac3 weekly MD, and then delivered again to the PS.

Issues:

- LEIR stills suffer from inconsistencies between the LSA settings and the hardware, making trims hazardous and irreversible.
- Now that the machine is coupled, the rest of the complex imposes a 29BP supercycle, forcing LEIR to use one ZERO 1BP cycle. The ZERO cycle needs to be set up with the proper timings for Ar in LEIR and Linac3, as it currently prevents the following cycle from being properly executed. It was discussed whether it was possible to change from a supercycle with 29 basic periods to another non-prime number. As the SPS also requested a supercycle composed of 22BP, it was accepted by everybody.
- Extraction Kicker timings; some obsolete timings are still in the working sets. Some cleanup is necessary.

D. Manglunki thanked everyone involved.

PS (G. Métral)

Ions were injected on Tuesday evening, but out of phase between LEIR and PS. It was impossible to find the LEIR extraction kicker start, and operators will need to see what timing is actually connected to that kicker to diagnose what timing is driving that kicker. Several timings are in the database, but none of these seems to act as start timing. Everything else was therefore changed to allow beam to circulate and extraction was done on D3. Setup is ongoing. It is therefore promising, but far from finished.

B. Mikulec asked if an access in the ring was needed to check the timing that starts the LEIR extraction kicker and it was answered that indeed it is inside the ring. D. Manglunki pointed out that the beam was “delivered” on the scheduled date, despite the total absence of cold checkout.

3 Schedule / Supercycle / MD planning

The schedule has been updated by M. Lamont to version 1.7 and is available at:

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

It is important to note that the Linac3 stop in week 45 was added and that the first week of SPS scrubbing run was reduced and moved to the last days of the run due to the SPS MKP kicker commissioning. The AD start of physics date was also changed to the 1st of September, but must again be modified.

A. Bland said that the Technical network disconnection test would take place on Sept 8th from 9-11am. D. Küchler asked if the tests should be done with or without beam and A. Bland answered that this test should be done with beam.

All planned interventions for the injector complex are available via the on-line agenda:

<https://espace.cern.ch/be-dep/FOM/Lists/Agenda/calendar.aspx>

4 AOB

There was no AOB.

5 Next meeting

The next meeting will be held on Tuesday, 9th September at 10:00 in 874-1-011.

Preliminary Agenda:

- 1) Follow-up of the last meeting
- 2) Status of the machines
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