

Minutes FOM #41, 08.11.2022

Chair: A. Rodriguez

Participants: Aguiar I, Albert M, Albright S, Antoine A, Asvesta F, Bacak M, Barbet V, Bellodi G, Biancacci N, Bidault N, Bracco C, Bravin E, Chapuis D, Chapuis F, Comblin JF, Cotte D, Di Giovanni GP, Di Luca S, Fadakis L, Fernandez R, Fleury S, Guerrero A, Haase M, Hans O, Jaekel M, Korysko P, K uchler D, Lang T, Li K, Lozano M, Mahner E, Mataguez S, Mikulec B, Pace M, Papotti G, Pasinelli S, Pereira L, Petrika G, Pittet S, Ponce L, Pruneaux C, Rae B, Robertson C, Rodriguez A, Rossi C, Saint Sulpice B, Salvant B, Sanchez JL, Schenk M, Schwarz P, Siesling E, Simon P, Skowronski P, Spierer A, Steerenberg R, Timeo L, Valentin P, Velotti F, Vincke H, Wegner R, Zamantzas C, Zevi Della Porta G.

Indico: <https://indico.cern.ch/event/1200178/>

Agenda

1. Approval minutes previous meeting & action follow-up (A. Rodriguez)
2. Reports from Accelerators & Facilities (Coordinators)
3. MD requests and dedicated MDs (B. Salvant)
4. Short-term Injectors Schedule Outlook (A. Rodriguez)
5. AOB

1. Approval minutes previous meeting & action follow-up (A. Rodriguez)

- **Actions: 1) R. Fernandez** asked about compatibility of LINAC3 MD and PS activities in Wk 45. **A. Guerrero:** informed **R. Fernandez** that they are compatible. **2) B. Salvant** requested two additional MD slots in the remaining weeks. **A. Rodriguez:** discussed with **R. Steerenberg**, possibility to do this Friday, 11.11., but later on the schedule is too packed. Information passed on to **B. Salvant**. **3) Requests to run several facilities running past 28.11.** **A. Rodriguez** sent slide to IEFC after FOM. Request was rejected, but they agreed to rediscuss during IEFC, but again with negative outcome. Final discussion took place during ATS Management Board meeting. Received e-mail yesterday that decision is negative and facilities will not be able to run after 28.11. They left door open for some mitigation actions. Message was communicated to AWAKE, CLEAR, and ISOLDE teams. Feel free to bring up ideas, if any, to compensate for the lost beam/physics time after 28.11. **UPDATE: Request to run off-line Physics at ISOLDE between 28.11 and 05.12 finally approved by the ATS and EP management. Decision communicated by email on 10.11.**
- Minutes approved without further comments.

2. Reports from Accelerators & Facilities

Only main points and discussions are written out – for details, we refer to slides (hyperlinks in title).

a) TI (C. Pruneaux)

- **Incidents: 1) Mon, 31.10.:** electrical trip on UJ33 from sump pump (short-circuit) and DQR cooling station in error. Faulty pump to be exchanged during next access. **2) Fri, 04.11.:** SEQ8 compensator trip. No consequence on cryogenic installations at restart.

b) Linac4 (G. Bellodi)

- **AFT:** 96.4 %.
- **Fault:** rf controls PLC communication problem (~3 h), signal likely blocked at RFQ PLC. Since all PLCs connected in series, propagated error to all other klystrons. Rf Piquet had to reset PLCs one by one. Problem reoccurred the same night (another ~3 h). Root cause unclear. Has happened a few years ago. If problem reappears will need further investigations.
- **Coordinator:** J.B. Lallement.

Comments / questions:

- **A. Rodriguez:** are the 3 h downtime mainly due to system warming up after reboot? **G. Bellodi:** no, mainly time taken for Piquet to do intervention. **R. Wegner:** some pressure measurements for air exchange

blowers were blocked. Piquet had to come on site. Known that this occurs from time to time when system has to be restarted. This is why it took so long as well. Problem will be addressed during YETS.

c) **PSB** (C. Bracco)

- **AFT:** 95.3 %.
- **Faults:** problems at two quadrupoles in BTY line, required Piquet intervention (affected ISOLDE).
- **Highlights:** successful preparation of all beams for different SPS and LHC MDs & Van der Meer scans. Supercycle with HRS and STAGISO in parallel prepared and fulfilling requirements.
- **Coordinator:** J.F. Comblin.

d) **ISOLDE** (E. Siesling)

- **AFT:** 97.1 % (GPS), 86.5 % (HRS / REX-HIE).
- **GPS:** STAGISO beam from PSB with low proton current. Smooth and successful run.
- **HRS / REX-HIE:** reduced target setting up time available as original setting up had failed. Nevertheless, started production ahead of schedule.
- **Faults:** **1)** several trips of REX and SRF rf amplifiers. **2)** HRS separator magnet MAG60 B-field regulation failed & MAG90 controls, in process of restarting. MAG60 issue could not be resolved: set magnet current manually to save physics run. Specialists are addressing the issue now that the run has finished.

e) **ISOLDE Users** (K. Johnston via e-mail)

- Busy week at ISOLDE with five experiments running on GPS and HRS.
- GPS: 111Cd isotopes were produced for solid state physics and quadrupole measurements of radioactive molecules. Went very well with consistently good yields throughout the week. Scientific programme was achieved.
- HRS: first experiment with Miniball spectrometer in four years on the XT01 beamline. 130Sn was produced in the form of 130SnS and the intensity of the beam was excellent. Experiment expects that they have seen the Coulomb excitation of 130Sn, but given issues with new DAQ being used, they will only know for sure after detailed analysis.
- The collaboration also wishes to thank E. Siesling and the technical teams for all their efforts over the weekend in getting the HRS up and running which saved the run.

f) **PS** (A. Guerrero)

- **AFT:** 94.7 %.
- **Issues:** **1) PE.SMH16:** non-resettable trip. Piquet had to intervene. Was an isolation problem. **2) KFA45** problem at the same time (no beam to EAST). Had to reboot FEC. **3) Two POPS trips**, but not related to PSU issues seen previously. **4)** About ten shots with ions sent to IRRAD by mistake. Now, beam programmed with a quadrupole disabled to avoid any ions arriving there. **5) Call from TE-VSC:** peak at start of TT2 line. Have not found anything in particular.
- **Activities:** **1) Many MDs**, incl. setting up of MD beams for Wed and LHC MD2. **2) Ions to SPS** in preparation for SFTION and LHC ion tests. **3) EAST:** work on spill and tails reduction. **4) MTE barrier bucket:** adjustments for loss reduction. **5) T9 beam:** re-centred.
- **Coordinator:** D. Cotte.

Comments / questions:

- **A. Rodriguez:** concerning ions sent to T8 line – is that followed up by OP? **A. Guerrero:** yes. Beam was defined with destination EAST DUMP, but came back with default destination T8. The next time the procedure was done there was no issue. **A. Rodriguez:** there will not be any measures other than the quadrupole disabling? **A. Guerrero:** there will be other measures, but at this moment that was the quickest solution. **D. Cotte:** have created a JIRA issue for the timing app to implement rule to avoid sending protons and ions to the same destination. Will be implemented during YETS.

g) **East Area** (B. Rae)

- **AFT:** 96.2 %. Good week.

h) **East Area Users** (*M. Jaekel*)

- No comments received for EAST.

i) **PS – nTOF** (*M. Bacak*)

- Thank you to PS teams for dealing with the many access requests over the past weeks.

j) **ELENA / AD** (*S. Pasinelli*)

- **AD: 1)** Horn fault, required local reset as remote not possible. **2)** Water leak on C10 cryo-pump, fixed. **3)** Water leak on e-cooler, exchanged water pipe. **4)** PSB + 2 turns: 5% more extracted intensity.
- **ELENA: 1)** Several correctors OFF in Alpha line, control board exchanged. **2)** Control board of source filament repaired. **3)** Glitch on Gbar vacuum pump closed fast vacuum valve.
- **New Vistar deployed** (*see link on slides*).

Comments / questions:

- **A. Rodriguez:** were you able to run without cooling of cryo pump or did that result in downtime? **S. Pasinelli:** we cannot run without the pump. But there was a small leak and had to address. Not sure we could stay until end of run. **J. Ferreira:** it was a small, but continuous leak resulting in too much water to run for long. Changed cryo compressor, 1 h without beam. There was no way to reroute the water, so best was to fix the leak.

k) **SPS** (*K. Li*)

- **AFT:** 89.8 % (*excluding H2 collimator exchange*).
- **Activities:** dense program with ions, dedicated MDs, preparation of LHC MDs, LHC fillings, SFTPRO. Had very long supercycles, slowing down setting up and fine tuning. **1) Slip-stacking during dedicated ion run:** works in principle, but beam quality to be improved. **2) LHC filling** going smoothly. **3) SFTION:** poor availability in previous weeks, had to catch up. Not done yet: debunching and recapture works, but beam quality to be improved this week and facing some obstacles in max. achievable voltage. **4) LHC EARLY ion beams:** extracted to TEDs and ready for LHC ion tests on 17.11.
- **Plans: 1) LHC MD2 block:** ongoing. Preparation of 8b4e could not be completed on Friday, going on in parallel to MD. **2)** Need more ion commissioning slots, likely Thu & Fri. **3)** AWAKE starts during weekend.
- **Coordinator:** A. Spierer.

Comments / questions:

- **A. Rodriguez:** given the long supercycle, at some point it becomes impractical to do stuff. Would you avoid doing some things in parallel? **K. Li:** that is what has been done. The main setting up was done on the short cycle, but the real test is to be done on the actual long cycle itself. This is where parameter tuning has to take place in the end. **A. Rodriguez:** it seems there is no easy way to rebalance the supercycle length. **R. Fernandez:** will you request ions on Thu & Fri? **K. Li:** very likely yes. **R. Fernandez:** last week announced dedicated LINAC3 MD on Thu. Just to take this constraint into account. Physics comes first, but if possible to account for MD, please do. **K. Li:** can rediscuss Wed evening. Also, Wed early morning there will be another firmware upgrade, ~1 h downtime (affecting ion team only).

l) **SPS North Area** (*B. Rae*)

- **AFT:** 74.0 %.
- **Faults:** potentiometer issue on H2 collimator. Long RP cool-down, but intervention was successful.

Comments / questions:

- **A. Rodriguez:** are you following up the AFT propagation of faults? It looks like it from the availability this week. **B. Rae:** checked with SPS OP, with Big Sister now propagating faults with destination SFTPRO. Looks better now. To be discussed also with PS.

m) **SPS North Area Users** (*M. Jaekel*)

- COMPASS has lost polarization. Running their last days. Have collected about 19k spills in one polarization. By yesterday evening, had around 8k spills for second sub-period. Would need about 8-10k spills. High priority for us before the run ends Wed morning.

- **K. Li:** unfortunately, LHC MDs are ongoing at the same time as well. But shift crews are informed to switch to 3 SFTPRO in supercycle whenever possible. **M. Jaekel:** thank you. Will check again with COMPASS on Wed and see if they need a few more hours.

n) **AWAKE** (*G. Zevi Della Porta*)

- Preparing electrons, laser, and diagnostics for the run starting this weekend.

Comments / questions:

- **K. Li:** do you have a rough time estimate when you are going to do the scans? **G. Zevi Della Porta:** will start Sat 8 AM, expect by ~10 AM to start moving around proton beam. Usually, we move proton beam by ~1 mm, but this time would like to go up and down by 1 cm. Will use BLMs for diagnostics. **K. Li:** will inform shift crews that this needs to be done on Sat morning.
- **A. Rodriguez:** when was the last time you changed e- gun cathode? **G. Zevi Della Porta:** it was replaced in March this year, after several years. Expect new cathode to degrade fast at beginning, but it is still OK. Get a QE of 10 % which is still plenty.

o) **HiRadMat** (*P. Simon*)

- Nothing to report.

p) **LINAC3** (*R. Wegner*)

- **AFT:** 100.0 %.
- Stable beam production of typically 35 uA out of Linac.
- **Events: 1) Fri:** scheduled oven refill. Retuning over weekend. Should be ready for the ion run. **2) Energy** measurements every day.

q) **LEIR** (*R. Fernandez*)

- Performance in terms of extracted intensity at the lower end (*see slides*), suspecting stripper foil degradation. Will be exchanged this morning which will hopefully bring intensity back up.
- **Activities: 1) Mon, Tue, Thu:** delivering NOMINAL & EARLY to SPS. **2) Wed:** delivering beam to PS for Pb80+ MD. Successful capture and first acceleration **3) Thu:** delivering beam to PS for LifeTime measurements cycle commissioning. **4) Other activities,** see slides.
- **Plan: 1) BI** access today to put special amplifier in place for one Ring BPM. **2) Beam** to SPS on Wed to continue ion commissioning. **3) Thu:** dedicated LINAC3 MD.
- **Coordinator:** M. Bozzolan, and R. Fernandez (Thu & Fri).

Comments / questions:

- **A. Rodriguez:** what are the next steps for the Pb80+? **R. Fernandez:** to understand where intensity loss comes from, would need to place stripper foil in EE or in ETL. But this is not straightforward. Other possibility is to upgrade BTV in PS septum with better screen for measurements. Not straightforward either, because septum needs to be removed. To go forward with Pb80+ need to make modification. We do not know the beam quality coming out after stripper foil. Are now sure it is Pb80 after analysis.
- **E. Mahner:** "LINAC3 issue" is not the correct wording as we are running with 100 % uptime and delivering 20 % above LEIR intensity. Machine is running very well. Concerning the lifetime in LEIR, it would be interesting to check the performance/life time on LEIR side, even if LINAC3 stripper foil reaches end of life (to be exchanged today, after 4 weeks). **R. Fernandez:** we have life time data for LEIR, to be analysed. To be discussed offline. **A. Rodriguez:** do you lose beam because of e- capture and losing charge state? **R. Fernandez:** it is because of the e-cooler that the life time measurement is not so straightforward. **E. Mahner:** loss could indeed be due to recapture of e-. **J. Ferreira:** will you make life time data available? **R. Fernandez:** yes.

r) **CLEAR** (*C. Robertson*)

- **Last week:** three experiments on Cherenkov diffraction radiation bunch length and position monitor, as well as fibre dosimetry studies.
- **This week:** collimation dosimetry studies.

s) **LHC** (E. Bravin)

- **Good week, with high availability:** ~85.1 %.
- **Faults:** **1) Tue:** beam dump caused by access maintenance mistake (human error). **2) Fri:** scheduled access, followed by MKD fault access. **3) Sat:** fault access (PIC & DFB heater). **4) Mon:** rf issue on B2 perturbing most of day activities. Resolved changing a threshold setting, to be followed up. **5) High-intensity physics** until Sat, then MD block. Some MDs suffered from injectors issues (*Sun night*).
- **Good physics production:** integrated luminosity now beyond 32 fm^{-1} (ATLAS, CMS).
- **Plans:** **1)** MDs until tomorrow. **2) Wed:** Van der Meer scans until Sat. **3) Sat:** recover normal physics.

Comments / questions:

- **A. Rodriguez:** will the lost MD time be recovered? **E. Bravin:** MD program is very packed and missed slots will need to be rescheduled sometime in the future. Likely next year.

3. MD requests and dedicated MDs (B. Salvant)

- **Last week:** short parallel MDs in PSB & PS. Last dedicated MD in SPS.
- **This week:** dedicated LINAC3 MD on Thu morning. Short parallel MDs in PSB and PS. Short parallel MDs in SPS on Thu and Fri (*many thanks to OP and physics coordinator for Fri MD slot!*).
- **Next week:** long parallel MD on Wed.
- **Upcoming:** one short parallel MD and one long parallel MD slot.

Comments / questions:

- **B. Salvant:** in case there is a clash with the LINAC3 MD this week – does the radiation survey on 15.11. concern only proton machines? **H. Vincke:** there will not be ion beams in parallel. Machines are switched OFF to go in (~2-3 h). **B. Salvant:** maybe LINAC3 experts could take the beam during that time? **H. Vincke:** probably yes, but need to check offline. For SPS it will take about 2-3 h, for smaller machines will be faster. **E. Mahner:** have not heard anything about stopping LINAC3. **K. Li:** question concerning the parallel MDs on Thu – will they take place? **B. Salvant:** yes, short parallel MDs. **K. Li:** need to see with SFTION commissioning, what status and priority are, to avoid too many users in the supercycle. **B. Salvant:** they are short parallel MDs (6 BPs) and should be “quite parallel”. **E. Mahner:** if you need the beam for SPS, we could skip LINAC3 MD if needed. **K. Li:** thank you very much, will check together again on Wed evening.

4. Short-term injectors Schedule Outlook (A. Rodriguez)

- LINAC3 oven has been refilled, and LHC MD2 block is ongoing. AWAKE run 5 is coming up. We are almost at end of run. Unfortunately, IEFC and ATS Management Board rejected requests to run ISOLDE, CLEAR, and AWAKE past 28.11. **UPDATE: Request to run off-line Physics at ISOLDE between 28.11 and 05.12 finally approved by the ATS and EP management. Decision communicated by email on 10.11.**

5. AOB

- None