Minutes FOM #06, 08.03.2022

Chair: A. Rodriguez


Slides: https://indico.cern.ch/event/1132389/

Agenda

1. Approval minutes previous meeting & action follow-up (A. Rodriguez)
2. Reports from Accelerators & Facilities (Coordinators)
3. PSB alignment intervention (P. Valentin)
4. Short-term Injectors Schedule Outlook (A. Rodriguez)
5. AOB: Access point maintenance notification (D. Chapuis)

1. Approval minutes previous meeting & action follow-up (A. Rodriguez)
   - **One open action from last week (J. Rodriguez):** kapton foil on quadrupoles of TT10 line. Discussed with B. Mikulec and V. Kain: can continue as they are. From hardware point of view there is no risk. Need to see if there is impact on beam quality when beam is injected into SPS and take action for YETS in case.
   - Minutes approved without further comments.

2. Reports from Accelerators & Facilities
   a) **TI (J. Nielsen)**
      - **General clarification on how TI events are reported at FOM:** only reporting events that have impact on experiments or accelerators (“serious events”). All events are logged, though. Also no events for LHC are presented at FOM. Decisions can be revisited if needed.
      - **Last week:** quiet apart from UPS in NA which is out of service, i.e. no backup power in BA82. Waiting for repair.

   Comments / questions:
   - E. Siesling: was there a power glitch last night? Have been doing RF commissioning tests overnight and saw lots of faults. Not clear where they came from. **J. Nielsen:** nothing has been declared, but received e-mail from RTE. Please send time stamp to cross-check.

   b) **Linac4 (F. Roncarolo)**
      - **AFT:** 98.2 %
      - **Faults:** 1) Wed (20’ down): MEBT sector valves closed due to fast vacuum spike. Not clear what caused it. Very rare event. 2) Fri (60’ down): assessment of source 2 MHz RF amplifier saturation level. Amp gain had to be readjusted 2x during last 2 weeks, required some compensation. Plan: reassess for next 2 weeks on Fri mornings to see if degradation continues. If it does, tube replacement necessary. N.B.: source has been delivering requested >= 35 mA flat pulse. 3) Sat (90’ down): DTL1 fault, 2x over-voltage. RF piquet performed checks before second restart.

   Comments / questions:
   - A. Rodriguez: short stops on coming Fridays, what time is it planned? **F. Roncarolo:** can be agreed upon. Should be only a few minutes. Coordinator will circulate the time for others to profit in case.
- **A. Rodriguez**: concerning potential replacement of tube – let us know in advance to profit from downtime also in other machines. **F. Roncarolo**: will be likely reported next week if replacement needed.

c) **PSB (F. Asvesta)**
- **AFT**: 91.5 %, dominated by access on Mon
- **Faults**: 1) Access for realignment of R2 BSW1L1.1 and 3 quadrupoles and RF CTRV output problem (see previous FOM). Successful access: ring rms orbits improved 1 - 1.5 mm. 2) 4 out of 5 faults related to QUAD-A circuit and led to POPSB faults. EPC installed oscilloscope during source intervention on Fri. Short stop of 10’ needed this week (possibly during SPS beam-based alignment or AD / nTOF DSO tests). 3) Short faults of extraction elements, reset from CCC. 4) ISOLDE DSO test.
- **Activities**: 1) LHClNDIV & MTE: within specs. Taken regularly by PS for BC. Also requested by SPS for BC. 2) ISOLDE: first beam on Fri. Ref measurements on transfer line and new operational variants with min. losses. 3) LHC25: progress and close to LIU targets. 4) TOF: new variant with low intensity and high V emittance. 5) AD: initial setup completed. Beam stable along cycle.
- **Plan**: finalize setup for all operational users.
- **Coordinator**: J. F. Comblin.

Comments / questions:
- **A. Rodriguez**: concerning the 10’ interruption – inform by e-mail for others to profit from downtime.

d) **ISOLDE (M. Lozano)**
- **GPS**: 1) SEMGRID installed on Wed. 2) Beam emittance studies on Tue. 3) Ref. setup for GPS to RC4 and LA1 for plasma target. 4) Anote1 target PSU found broken. Replaced with spare, but was also broken. Third one solved problem. 5) First protons from PSB: some problems at BTY line during weekend. Solved Mon morning.
- **HRS**: 1) Target #734 installed at frontend on Thu. 2) Debugging of gas injection application ongoing. 3) HRS to RC4 reference setup for plasma targets. 4) DSO tests on Tue.
- **REX/HIE-ISOLDE**: 1) Restart of HIE RF systems for lower power test at warm. 2) DSO tests on Mon morning. RF and beam permit signed and OK.

Comments / questions:
- **E. Piselli**: would like to thank BI teams helping to understand noise on Faraday cups and wire-scanner readings. Still some small issues, being addressed.

e) **ISOLDE Users (K. Johnston)**
- Not much to report, but schedule for first 10 weeks published last week. Physics starting in ~3 weeks.

f) **PS (D. Cotte)**
- **BC activities (see slide 2 for full list)**: 1) Phasing of cavities 200 MHz, 40 MHz, and 80 MHz. 2) Energy matching with PSB on INDIV. 3) BLM measurements in TT2. 4) BTP kick response OK. 5) PS / SPS synchro tested on Thu.
- **1) LHClNDIV for SPS**: energy matching with PSB (all rings OK). Energy matching with SPS first iteration today. 2) MTE Core: only for SPS, a.o. 200 MHz component optimisation. 3) Full MTE (4 islands + core): setup up to 1.3E13 ppp. Several tests on MTE extraction to better understand individual effect of each kicker. Losses in SS14 reduced with BFA9P. Good shadowing TPS15/SMH16 and good 200 MHz structure. 4) nTOF beam for commissioning: setup up to 200E10 ppp. Several measurements to qualify beam size done. Aiming for emittances of 12 mm.mrad (H) and 7 mm.mrad (V). 5) BLM measurements in TT2 (2021 vs. 2022): following SY-BI work during YETS, i.e. SWY channels recabling campaign, noise reduction by at least 3 orders of magnitude. Gets worse around 245 because new temporary channel installed in 248.
- **Status of beams**: see slide 7
- **Additional comments**: AD and nTOF DSO tests planned on Fri morning. Possible beam disturbance. EAST beam permit to be signed by Fri.
- **Coordinator**: A. Huschauer.
Comments / questions:
- **A. Rodriguez**: regarding BLM noise. What was done exactly? **D. Cotte**: shielding of cables was improved and how they are laid out (were too close to power cables). **F. Roncarolo**: confirm it was cable isolation and rerouting improvements. Will be also implemented in TT10 if successful.

g) **East Area Users (B. Ray)**
- Started dry run, i.e. turned ON all equipment of the lines. Everything looks OK. Hope to sign beam permit by Fri. Everything on track.

h) **PS – nTOF (M. Bacak)**
- DSO tests on Fri to be ready for beam next Mon.

i) **ELENA / AD (L. Ponce)**
- **ELENA**: 1) Resumed H- operation with circulating beam today. 2) Injection kicker conditioning completed. 3) Some YETS activities still ongoing in transfer line. 4) HW tests progressing well.
- **AD**: 1) machine closure delayed by 1 week to complete bake-out and reconnection activities. DSO tests in AD target and ring (without AD mains) on Fri 11.03. 2) C10 cavity, e-cooler, and AD mains HW tests starting Mon 21.03. Will leave only 1 week for hardware tests. 3) First beam planned for 28.03.

Comments / questions:
- **A. Rodriguez**: will it be possible to absorb delay to avoid pushing back physics? **L. Ponce**: we hope so. If no problem found with kicker and PSUs should be possible to absorb delay.
- **B. Mikulec**: will this delay have an effect on the FTA line commissioning? **L. Ponce**: should effectively have no impact.

j) **SPS (V. Kain)**
- **Final week of HWC**: 1) Had to exchange main dipole MBB43270 due to vacuum leak. Was organized and performed quickly. 2) **DSO tests**: ring, TT20, fast extractions TT40 & TT60. TEDs blocked in beam for time being. 3) RF power class arrived only on Fri: still issue with SIS subscriptions for conditioning checks. 4) TMR on MKDV3 had to be exchanged. 5) Noise issue on fast spill detector: 1 bumper & 1 extraction sextupole cause 300 Hz noise.
- **BC started this week**: 1) Injected INDIV and PILOT on PILOT cycle, as well as on Q20 and Q26 MD cycles. 2) Circulating MTE beam (synchronization to be re-visited). 3) Kick response measurements done overnight.
- **Plan**: Accelerate FT beam (MTE 5E11 p), prepare for beam-based alignment (BBA), and aperture measurements.

Comments / questions:
- **F. Roncarolo**: concerning fast spill detector noise – a filter was installed on Fri. Hopefully, low frequency noise mostly filtered out now.
- **B. Mikulec**: Have stop planned on Fri morning for DSO tests in PS. Would it be too late for you to do BBA then? **V. Kain**: unfortunately, yes. Have to do BBA ASAP to have margin for potential 2nd iteration during weekend.

k) **SPS North Area (B. Ray)**
- In HWC (magnet tests).
- **Next week**: DSO tests planned Mon & Tue in NA secondary area.

l) **AWAKE (G. Zevi Della Porta)**
- **Laser**: 1) Intervention by external manufacturer brought laser back online with new control system. 2) Recovered UV and IR alignments using only final mirrors. 3) Took data to test a quantum RL algorithm for trajectory optimization.
- **Electrons**: 1) observed e- beam on newly installed BTV and on streak camera using recently realigned upstream optics. 2) Took data to test a quantum RL algorithm for trajectory optimization.
- **Access**: 1) Access disruptions due to DSO tests in TAG42. 2) Patrol loss due to TAG41 being put in closed mode while internal door was open. 3) Patrol loss due to token handling issue at PAD.
- **Magnets:** 2 magnets disconnected in preparation for bringing them to surface in W10.
- **Plan:** Start of 2-week intervention to modify beam line in two places in preparation for April installation of high frequency BPM and integrating current transformer.

m) **HiRadMat (P. Simon)**
- Nothing to report.

n) **LINAC3 & LEIR (R. Fernandez)**
- Nothing to report.

o) **CLEAR (P. Korysko)**
- First beam in CLEAR on 01.03. Recovered all beam parameters (energy, charge, size, position, bunch length, etc). Broke record of beam transport in CLEAR achieving 94%.
- Beam is ready for users.
- This week dedicated to Electro Optical Sampling measurements with CERN BI.

3. **PSB alignment intervention (P. Valentin)**
- BSW1L1 alignment has a long history: 1) Pre LS2: EN-MME metrology of all magnets and BE-GM base plates and magnets alignment at workshop. 2) LS2: stack support marking and alignment and indiv. alignment of several magnets.
- **Septa magnets design limitation:** due to mechanical limitations roll angle not well known.
- **YETS ’21-’22 improvements:** SY-ABT set dedicated roll surface during coil reinforcement. BE-GM: fiducialised components and computed new alignment parameters. Realignment of 16 magnets to fit within tolerances.
- **B12.BSW1L1.1 issue:** following septa fiducialisation, bug discovered implemented in one process of SURVEY DB. Waiting for fix to avoid input errors. Asked for bulk update of new parameters via JIRA app. Due to human error only part of magnets updated and ticket closed without further checks. Follow up: was unusual BE-GM process. Will not occur again since bug now fixed. File mode to update alignment parameters is the rule. Added control step in workflow.
- **Status:** all 16 magnets aligned within tolerances. Very good agreement between alignment results and beam measurements. Septa roll angles well known now. Alignment workflow improved. Remaining mech. Constraints make alignment complicated and time consuming.
- **Further suggestions:** 1) BI.BSW1L1: installation of dedicated roll surface on remaining magnets. 2) Generally: avoid designing hyper-static supporting systems. Plugin systems have accuracy limitations. 3) Keep line of sight through alignment targets free (fit “Survey Guidelines”).

Comments/questions:
- **M. Albert:** concerning installation in your suggestions. Can this be done in a TS or only during next YETS? **P. Valentin:** this installation is not a necessity. Need to open yoke to measure lamination. Would be done parasitically but would not open magnets specifically for that. Maybe not really needed even.
- **G.P. Di Giovanni:** thank you to P. Valentin and team to correct everything. Great that they put in place all corrective actions to avoid issue in future. Was work inside workshop not enough to predict what could happen in the machine? **P. Valentin:** work was done well at the workshop. Are applying plugin systems in other machines and we cannot guarantee accuracy for these. Have to keep possibility to align in field.
- **P. Bestmann:** idea to make mock-up on surface is very good. Idea was to align full stack on surface and then just align the stack as a whole in situ. Realized that not really feasible. Put together in “Survey Guidelines”.

4. **Short-term Injectors Schedule Outlook (A. Rodriguez)**
- **Two big milestones this week:** first beam to SPS and first protons to ISOLDE. Congrats to everyone.
- **Next milestones:** beams to nTOF and East Area.
5. **AOB: Access point maintenance notification** (*D. Chapuis*)

- **D. Chapuis:** 2 access point maintenance (APM) notifications: 1) Linac4 zone on Thu and Fri. IMPACT waiting for approval from BE-OP. 2) PSB: Mon & Tue next week, also waiting for approval. Any clashes / access requests in these time frames?
- **P. Skowronski:** there will be access to PS on Fri and Linac4 may want to profit from that downtime. APM would be blocking. Could it be delayed to another day? **D. Chapuis:** will move Linac4 APM to Mon & Tue, and PSB APM to end of next week.

*Minutes by M. Schenk*