

FOM minutes 08.06.2021

List of participants in ZOOM meeting: Albert M. Albright S. Alvarez J.L.S. Antoine A. Antoniou F. Asvesta F. Barbet V. Bartosik H. Bestmann P, Biancacci N. Bojtar L. Chapuis D. Comblin J.F. Damerau H. Deleval S. Delrieux M. Fadakis E. Farabolini W. Fernandez R. A. Findlay A. Fraser M. Giovanni P. D. Gousiou E. Grenard J.L. Haase M. Hans O. Hofle W. Huschauer A. Johnston K. Kain V. Karpov I. Kuchler D. Lallement J. B. Lang T. Lasheen A. Li K. S. B. Lombardi A. Madysa N. Mahner E. Mataguez S. Matheson E. McFarlane D. Mikulec B. Newborough A. Nuiry F. X. Oliveira J. C. Papotti J. Piselli E. Ponce L. Porta G. Z. D. Praena J. Pruneaux C. Rae B. Roncarolo F. Rossi C. Rumolo G. Salvant B. Scrivens R. Siesling E. Simon P. Skowronski P. Somoza J. A. F. Steerenberg R. Tecker F. Timeo L. Velotti F. M. Vincke H. Wegner R.

Slides: <https://indico.cern.ch/event/1042898/>

Agenda:

1. Approval of the minutes of the previous meeting & Action follow-up
2. Reports from Accelerators & Facilities
3. Short-term Injectors Schedule Outlook
4. A.O.B: Brief preliminary report on BA80 fire and possible consequences for operations.

1. Approval of minutes of previous meeting and action follow-up

- The minutes is accepted without further comments.

2. Reports from Accelerators & Facilities

TI by C. Pruneaux:

- Fire in BA80 at 16:00, Friday. The fire brigade came at 16:10 and activated l'AUG EUB1/A80.
- Smoke propagated towards TCC2, TDC2, TA802 et TA801. Ventilation was stopped manually.
- At 17:40 the piquet EL put back the tension.

Linac 4 by L. B. Lallement :

- Monday to Tuesday: Few minor trips.
- Wednesday: Pre-chopper issue with 1h45 down-time. High voltage divider to be replaced. Tunnel access required.
- Thursday: 30 minutes intervention on PIMS 11-12 klystron vacuum pump power supply. Klystron trips became more and more frequent. RF team observed the klystron vacuum level was degrading. Power supply was replaced in the shadow of the SPS beam stop.
- Friday –Sunday: Rather smooth operation with minor trips.

Questions and comments:

- P. Skowronski asked if the network intervention planned next Tuesday will cut the beam. R. Steerenberg said that normally it does not, since this is on the general purpose network, but he will check.

Booster by J.F. Comblin:

- Issues: 15 faults from Linac 4. Some issue with power converter of BT1.SMV10. During 2 days, beam was not produced from Linac 4 from time to time. BIS was cutting the beam due to a change of

the FGC interlock window of BI.SMV10. This was not reported by the diagnostic application because the bad condition was very short.

- Progress: After the GPS line last week, beam was set up to the HRS line. Kick response and dispersion measurements done. Thanks to the new optic model, the steering was simpler. Full set of reference measurements were taken for both ISOHRS and STAGHRS beams. After the GPS line last week, set-up the beam to the HRS line. Kick response and dispersion measurements done. Full set of reference measurements were taken for both ISOHRS and STAGHRS beams. New calibration curves for the main bends were tested with good results, but further smoothing is needed. MTE beam: The longitudinal emittance was further optimized and the stability problem cured. Injection studies: On the MTE beam, the injection oscillations were minimized in both planes and transverse painting applied. This gave a better transverse ring-by-ring emittance uniformity.

Questions and comments:

- R. Steerenberg asked if some dedicated time needed for the B- train update. J.F. Comblin answered that it will be done on the spare system and can be done parallel with beam.

- R. Steerenberg asked if EPC needs more time for POPS-B tests. J.F. Comblin and P. Di Giovanni answered there are some more tests to do.

-H. Bartosik added that they prefer to have the smallest possible transverse emittance on the LHC pilot beam.

ISOLDE by L. Fadakis:

- HRS: On Tuesday 1st of June the SEMGRID target was put on HRS from GPS. PSB was not able to start measurements, due to signal issues on the fixed SEMGRID. Issue resolved on Wednesday morning by BI and measurements could start. PSB continued measurements with NORMHRS beam until Friday when they changed for STAGISO. Friday afternoon measurements finished, proton request turned off. PSB reports no major offset to the beam which agrees with the alignment measurements. Regarding the fixed SEMGRID, they are getting old and especially on the HRS side it was giving troubles for PSB to get a signal. Will start organizing a consolidation plan. Target #659 was put in HRS on Monday. This week will set up stable beam, then take protons and deliver beam from HRS to the new tape station GPS. On Tuesday 1st of June, target #638 was put in GPS. Entire week delivering beam from GPS to GLM and GHM

- Follow up on the incident that took place last Sunday: The SRF specialist assessed the impact on the SRF cavities. The cavities did not need to be reconditioned. The cavities were handed back to OP. Could not start cavity XLH1.CAV3 and RF, the issue is fixed remotely. Phasing of the buncher, IH and the 7gap1 structures completed for beams. Reference set-ups for those A/q's at 1.55 MeV/u. Problem with the amplifier for the 7gap2 found. The power seems to be limited to ~ 2kW, RF specialist fixed the issue. Phasing of 7gap2 and 7gap3 structures for beams with A/q= 3.333.

Questions and comments:

- F. Tecker asked if there is any update on the vacuum state of the SEM grids discussed last week. There was a discussion with several people involved. The conclusion is that there should be some procedure implemented to make sure the vacuum pumping has really started when it was launched.

- E. Siesling added it is worrying that a single temperature sensor failure can bring down the cryo plant. He will followed this up.

PS by F. Tecker :

- Beam commissioning: In the shadow of a SPS stop C20-92 cavity repair, put back into operation later that day. Wire Scanner noise: no effect from switching off equipment. Timing for the synchronization of the BLMs in TT2 implemented.

- AD setup: Work on longitudinal blow-up modulation frequency and amplitudes. Transition crossing timings and RF settings adjusted, One-Turn-Delay Feedback enabled, negative chromaticity corrected. Intensity increased to the nominal value of $1400e10$. Some remaining losses at injection, very sensitive to the magnetic cycle placed just before.
- LHC 25ns emittance: Measurements along LHC cycle for nominal intensity, 1.7-1.8 mm mrad, the vertical is 1.25 at injection. BCMS cycle with low-chromaticity optics: no significant vertical emittance blow-up at injection plateau.
- BCTs in TT2: Many tests were performed at various intensities. The signal is much cleaner after removing amplifiers in the tunnel. Being followed up with the experts. An amplifier has been installed at the surface rack for BCT126 to measure low-intensity beams.
- Progress on several other systems: Internal dump TDI47, F16.BHZ377, F16.BHZ378, 10 MHz cavities, QKE16, DFA timings adjusted.

Questions and comments:

- F. X. Nuiry explained the reason for the FESA class update for dump TDI47. Also answered B. Mikulec's questions about the temperature sensor on the dump.
- R. Steerenberg asked if it is possible to cycle F16.BHZ377 and F16.BHZ378 between the destination SPS and the dump from the timing point of view. F. Tecker answered that the timing system can not easily be changed, but it has little impact on the operation.
- R. Steerenberg asked about the reason for the BCT noise. B. Mikulec answered it is due to several reasons and should be followed up case by case.

ELENA and AD by L. Ponce:

- Concerning the multi RF-segment setting-up, the firmware bug causing trouble to change harmonics on different RF segments identified and fixed. Got help from RF experts to improve capture by adjustment of phase loop gain.
- General cycle adjustment for a nominal pbar cycle.
- AD: Installation of plastics cover on quadrupoles completed. BCCC refilled, He leak fixed. Machine closed and deconsigne on Monday 14th June.
- AD target special permit for powering tests issued. Damaged cable for dogleg repaired. Magnetic horn tests on-going.
- Problem with FGC_93 (electrostatic elements in the transfer lines) fixed.
- Issue with the ion source: Trip of the HV happens. Beam found moving again after vacuum gauge exchange. The situation much better than in the past due to improved diagnostics and could be steered back the beam with very high correctors settings.
- Replacement of profile monitors in LNI: Opening of the vacuum sector of the ion switch. Three new monitors to be exchanged and one taken out to upgrade mechanics. The aim is to have 4 monitors installed by the end of the week. Stop of ELENA Hminus operation for 3 weeks.

Questions and comments:

- R. Steerenberg asked if the FGC problem is still related to switching on at the wrong time. L. Ponce answered this is not the same FGC, it is a different problem, they are tripping due to loss of communication.
- D. Chapuis asked when the special permit can be revoked for the AD target. L. Ponce answered in a few days.

SPS by B. Li :

- SFTPRO: All 5 turns taken from the PS - $< 4e11$ ppb, slow extraction coarse setting up done. Remaining: BSI adjustment for servo-spill, mini scans tests, extraction setting up in PS with all islands,

RF gymnastics for debunching at flat top.

- AWAKE extracted to experiment. Re-phasing improved after FW update, RF gymnastics started, conditioning paused. Remaining the setting up of RF gymnastics, conditioning.
- LHCPILOT: Aperture measurement of extraction channel + TPSG alignment. Remaining the kicker waveform scan.
- Scrubbing progressing, reached 72 bunches at full flat bottom as planned. Main limiting factors are MKDV vacuum and pressures in BA6 and BA5. Remaining: 4 batches at flat bottom.
- Accesses on Tuesday morning for BSI checks, SEMs for mini-scans, ALPS circuit breaker, QF/QD regulation checked, but needs more follow-up.
- Strict procedure to follow for switching between scrubbing and non-scrubbing mode to protect MKDV.
- BHZ sent MTE to SPS without request, already investigated by the PS.
- MKP not pulsing at irregular intervals at first injections when taking the scrubbing beam. Beam was finally stopped Sunday late afternoon as the situation started getting worse. Finally tracked down to a problem on the FEC and solved temporarily by advancing one of the tasks, under investigation.
- ECA5 access system problem occurred over the weekend, lost quite some time due to broken patrol.

Questions and comments:

- R. Steerenberg asked if the the beam can be provided to north area during week 25. B. Li said they are on track so far, but still there are beams to work on. Hard to tell at the moment.
- H. Vincke asked if the SPS sends only low energy or low intensity beam to the dumps. B. Li confirmed. H. Vincke asked to keep him informed when the high energy beam is available.

AWAKE by G. Z. D. Porta :

- Electron Beam: reinstated on Monday, used to commission new optics. Thursday: used new optics in electrons-in-plasma experiments, measured the energy/charge loss of 6 electron beams in plasma: 150 pC , 350 pC , 600 pC. Friday: set up beam for wake field diagnostic tests.
- UV Laser: compressor improvements increased electron beam charge, to be closer to the 2020 one. Max charge is now ~700 pC for a reasonable beam.
- Access System / Lights: patrol broken when person took a token and immediately put it back in its slot before entering TAG41 with no token. Investigating why radiation veto did not switch off automatically 30 minutes after the end of proton beam mode. Investigating why lights did not turn on again when the area was opened after the end of proton beam mode.
- Plasma wake field diagnostic: set up and aligned. Can observe significant light when laser travels in Rb vapor. At the moment, no visible difference between laser+Rb and laser+Rb+electrons.

Questions and comments:

- H. Vincke asked if RP is needed for access the plasma source. G. Z. D. Porta confirmed.

LINAC3 by R. Wegner :

- No beam operation scheduled for Monday and Tuesday.
- Wednesday last day with O+ ions. ABP + BI investigated FC5 signal.
- Thursday switch back to Pb+ ions, utilizing already used lead. Good intensity and stability reached quickly.
- RFQ amplifier, several problems: damage to sub-components of internal timing card, power supply of measurement box, capacitors on measurement card.
- Difficulties with tank3 amplifier, with anode filter box.

- Stripper ITF.STRIP02: a wire broke close to the switch. Source tripped due to overheating on Sunday afternoon.
- Source recovered quickly on Monday after the restart.

LEIR by C. Wetton and R. Alemany:

- Due to vacuum leak during bake out, accumulated one week of delay, therefore HWC will continue during week 24. But will be ready for beam Monday 28 after DS0 test.

CLEAR by W. Farabolini:

- Vacuum reached $7E-04$ mbar. Were lucky to be able to restart the ions pumps (bypassing interlocks) Better not to close all the sector valves .
- Optic Fibre beam loss monitor shows beam on thick target.
- Beam perturbations by ground vibrations observed.
- CHUV beam preparation: Rather stable beam of 25nC with 50 bunches. Above 50 bunches beam losses appear at the CLIC ACS position.
- RF generated by the beam in the structure. With down-mixing will check the tuning frequency.

Questions and comments:

- R. Steerenberg asked if the vibration issue is discussed with the civil engineering people. W. Farabolini confirmed.

NTOF, EAST AREA, HiRadMat: Nothing to mention.

3. Schedule : R. Steerenberg presented the schedule.

4. AOB:

Brief preliminary report on BA80 fire and possible consequences for operations by S. Deleval:

- Friday 4th of June 2021 at 16h00' smoke detection in the BA80. Concerned pump stopped at 16h10'06". Fire brigade intervened and hit the AUG button at 16h10'39", which stopped ventilation of the building.
- Historic: 10-years maintenance of the power cubicle performed by the manufacturer in 2016. New drawers installed in 2016. The plant was restarted the 25th of March 2021 after the annual maintenance The 3rd of May a problem appeared on the pump P4. Investigation with Schneider have led to the replacement of the VFD. The pump P4 was put back in service the 4th of June. The pump ran for 51 min before the fire.
- Investigation: Check of cabling, settings, threshold for the circuit breaker, nothing abnormal found. Still some information to collect. The most probable cause at this stage is a loose connection.
- Solutions: Cut the bus bar, reorganize and re cable the power cubicle to supply two pumps by the not so damaged column. Plan B is to resupply one or two pumps directly from EL power cubicles.
- Cooling potentially back on Friday but more reliable, planning will be done tomorrow evening.

Questions and comments:

- B. Rae added that most of the WH commissioning is done on the PC. Remains the DSO tests.