

FOM minutes 24.11.2020

List of participants in ZOOM meeting: Albert M. Albright S. Alvarez J.L.S. Amarilla M. Angoletta M. E. Antoniou F. Asvesta F. Barbet V. Biancacci N. Bilko K. Bojtar L. Chapuis D. Chapuis F. Comblin J.F. Damerou H. Deleval S. Delrieux M. Di Giovanni G. P. Fadakis E. Findlay A. Fortescue E. Gamba D. Haase M. Hanke K. Hans O. Jensen L. Johnston K. Kain V. Lang T. Lasheen A. Li B. Lozano B. M. Mahner E. Mcfarlane D. Mikulec B. Montabonnet V. Nielsen J. Nuiry F. X. Pace M. Papotti J. Pirotte F. Piselli E. Ponce L. Praena J. Rae B. Rodriguez A. Rossi C. Schwarz P. Scrivens R. Siesling E. Solfaroli M. Somoza J. A. F. Steerenberg R. Velotti F. M. Vincke H. Wegner R. Wetton C. Wilkens H.

Slides: <https://indico.cern.ch/event/973785/>

Agenda:

1. Approval of the minutes of the previous meeting & Action follow-up
2. Reports from Accelerators & Facilities
3. AOB: Vacuum leak in TT2

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

- M. Pace reported that the central timing was restarted this morning, no problems so far.

Open actions:

- **(BE-ICS): Verify if the issue of cross-talk of the Beam Imminent Warning and evacuation alarm between zones can be reduced (e.g. BA6 to TT2, LEIR).**

- Minutes of 17.11.2020 were approved without further modification/comments.

2. Reports from Accelerators & Facilities

TI by J. Nielsen:

- AUG in ME9 substation. The button was damaged during cabling work. It was replaced and the whole AUG chain tested before putting back in service.
- BA5 evacuation. It looks like someone activated the evacuation, BE-ICS is investigating what is the source of the evacuation and from where it was launched.
- Linac 4 tripped due to a missing water flow. Indeed an intervention was ongoing for a filter change on the klystron circuit and when switching from one circuit to another for changing the filter the flow dropped and caused a trip of the Linac 4.
- Some calls to CERN mobile numbers from CERN landlines (traditional/SfB/IP Alcatel/CERNphone) fail. Swisscom experts are investigating and working on a solution.
- Cooling towers in building 201 tripped and caused the compressed air, heating plant and some CRYO installations trip also. TI on-site to restart the cooling towers and compressed air rapidly avoiding the compressed air to reach a level where all installations at Meyrin would trip. Investigations about the reason of the trip is ongoing this week.

Questions and comments: - S. Deleval commenting E. Siesling's question confirmed that the compressed air in ISOLDE will be cut on Saturday during the TI intervention. The possible impact on

the cryo will be checked with the experts. J. Nielsen added that this will be addressed in detail at Wednesday's TIOC meeting.

Linac 4 by R. Wegner:

- Beam to Linac 4 dump only (PSB and SWY access).
- Investigation of open aspects in phasing procedure: Downstream cavities can be detuned or pulsed at low voltage to avoid TOF energy errors (1% amplitude, 1° phase). PM need to be well-calibrated to provide reliable TOF results. Distance between BPMs in layout database found to be partly wrong, had to be corrected in TOF FESA class (update for layout database ongoing). TOF timestamp required to be transmitted to OP-TOF application to align phase and beam energy measurement correctly.
- A new method using the beam phase in 1 downstream BPM was successfully tested. It can provide an independent energy measurement.
- The phase-shifter of CCDTL5-6 was re-adjusted. Satisfactory setting reached. However, the optimum is slightly outside the accessible range of 0 to 70°.
- Linac4 was completely re-phased. Good result: Symmetric profile with sharp edges, no tails.

Questions and comments:

- The water cut should be better coordinated. It was clarified that CV did indeed call RF before, but something was misunderstood. B. Mikulec recommends calling the CCC before.
- R. Steerenberg asked what is the guideline for the calibration of the BPMs. B. Mikulec answered that this will have to be done at the start of each phasing campaign.

Booster by F. Chapuis

- Daily activity during the week: Hardware tests checklist follow-up.
- Monday 16/11: BT3.QNO20 water leak found. Intervention planned in W48, already fixed on Thursday. All the channels of ring BLM's must be tested again as consequence of the magnet covers consolidation, 1 h scheduled in early W49. 1.4_GeV cycles momentum propagation to high-level parameters issue solved, some parameters were not correctly initialized.
- Tuesday 17/11: BTY.BVT101 test successful. Dry-RUN: Fast-Interlock application, BTP quads line, quadrupoles optimizer and pre-magnetic cycle mechanism tests.
- Wednesday 18/11: Issue concerning BTY.QDE120 / BTY.QDE209 / BTY.QDE321 / BTY.QFO210 / BTY.QFO322 which should be PPM and stayed non-PPM solved. BTY.BVT101 external condition problem due to wrong configuration in CCDE. Test planned on Tuesday 24/11.
- Thursday 19/11: BI.BCT10 base line extremely perturbed by BI.DIS10, investigation in progress. "Ferrites" around cables could be a solution. Dry-run on BCT: watchdog, injection BCT, BI.BCTWD.BR watchdog, extraction BPMs are ok. Issue of missing OASIS signals for some magnet circuits in BT-BTM solved.
- Friday 20/11: Dry-run on injection bumpers after TE-EPC + BE-CO troubleshooting, works as expected. H0/H- current monitor test with BIS condition on slave-BIC PSB1 test was successful. Damage due to covers consolidation: Vacuum pump feedthrough was broken and vacuum sector BR20 vented to PA, but consequences are minor. RF HL tests were done. The new LIU wire scanner repair and installation has been advanced to Monday 23/11 PM.
- Monday 30/11: Machine final inspection by BE-OP and HSE-RP to prepare the BEAM operation. To be confirmed and discussed with L4-Team. System to be re-checked consequently to the magnet covers consolidation are the ring BLM channels and WIC channels.

Questions and comments:

- R. Steerenberg asked if there are compensatory measures put in place where the magnet covers are not installed. F. Chapuis answered there are no at the moment, but a simple procedure will be within two weeks.

ISOLDE by E. Piselli:

- New firmware deployed by Enrico Bravin and BI on one of the Hie-Isolde BDB. Small problems with the 2 new silicon detectors solved by BI.
- Have completed the hardware commissioning of these 2 detectors and we used a $^{20}\text{Ne}^{8+}$ beam to do the beam commissioning.
- As part of machine study, a couple of days were spent to conduct different beam energy measurements using the dipole magnets in the HEBT lines as spectrometers and the silicon detectors as particle counters. Thanks to BI for their flexibility and help.
- Have a wire grid at GPS finally working again. Problem on the acquisition configuration have been solved by BI (A. Guerrero and M. Duraffourg).
- Started testing scalability and stability of REX at low A/q beams. So far, we haven't gone below 2.5 (the lowest limit at this point). The plan is to explore the range of A/q between 2.0 and 2.5.
- F. Wenander (ABP) spent few days characterizing the performance of the new cathode for different beams (^7Li , ^{23}Na and ^{152}Sm). Charge breeding of ^{129}Xe injected as gas into the EBIS was studied as well. The data taking is very manpower intensive as the complete GPS and REX low energy system has to be optimally tuned for each case.
- The instabilities in REXTRAP were hampering the measurements of ^{23}Na the past week. The reason for the two-stating instability is slowly being narrowed down, but not resolved at this moment.
- Setup of GPS stable beam to LA1 started. This work is needed to prepare operational set-ups with the current quad polarities to the LA1 and LA2 lines.
- A coupler of a stripping foil in one BDB in Hie-Isolde broke. BI will exchange it as soon they will receive from the manufacture.
- Some of the electrostatic power supplies tripped twice on Monday and on Tuesday due to vacuum interlock. Investigation's ongoing.

Questions and comments: It seems that there are no spikes on the vacuum, the interlock is probably a control issue. M. Lozano noted that the interlocks are bypassed now for a few days.

PS by M. Delrieux:

- Safety: Current accesses in Special Permit Mode. The n-TOF situation: the grid installation will be completed this morning. Then will patrol, remove the lockout on FTN power converters and proceed with the HW commissioning. SMH16 out of the chain.
- MSC tests: Heat runs, magnets inspections and polarity tests ongoing. Main coils / PFW / W8L inspections finished yesterday "only". Today beginning of the switch yard magnets with common circuit with PSR.
- Commissioning: Almost all auxiliary power converters are ready for magnets tests and controllable from the CCC. PR.DVT74 / PR.QSK74 : cabling in the machine tomorrow. Programmed functions for MTE and slow extraction multipoles have been optimized. Support of the vacuum chamber broke between F16.BHZ377 and F16.BHZ378.
- Dry runs and tests completed: KFA28 ok (signal saturation issue solved). KFA13 and 21 ok. SMH26 ok, but no acquisition: diagnostics delayed since SMH26 now has a veto. SMH16 and SMH61 are ok. SMH57 good progress, phase 4 will begin soon. Earlier start of B ramp-up tests ok for POPS.

ELENA by L. Ponce:

- Commissioning of transfer lines: Results for LNE50 measurements (by ABT) used to rematch for Gbar. Measurements on-going in LNE00 and improved profile monitors data quality.
- Again study of effect of magnetic system of e-cooler on circulating beam.
- Further test on calibration of magnetic pickups. Similar shapes of calibration pulse for both transfer lines pickups.
- Automatic injection oscillation correction: first results are promising.
- Test of timing system: To validate new implementation proposal of timing team for precise triggers to experiments up to 1 ms before bunch arrival.
- Low level RF system: Cavity servo loop operational now as well for harmonics >1 (mainly $h=4$). There is an issue now with synchro loop.
- Various studies on ring: Orbit, working point, coupling, chromaticity.
- Intervention on the Btrain: Erratic shot-to-shot fluctuations. Again noise on low field marker identified as cause, solved by commuting back from spare to operational B-train.
- Message to operations: B-train calibration user (zero cycle) should be inserted from time to time.
- Source: Dongle (interlock connector) exchange again.
- Ion switch: Trip again on Thursday evening, intervention on Friday. Investigation on-going on the root causes. Running out of spare pulsed PC, the available spare cannot be pulsed, so no extraction in LNE00 possible.

Questions and comments:

- R. Steerenberg asked if the B-train calibration can be done at the start or end of the cycle as in some other machines, instead of a dedicated zero cycle. To be checked.

LINAC 3 by R. Scrivens:

- The effect on the beam of the source movable puller was investigated more, with emittance measurements made with quad scans. The data is to be processed.
- Source gas controller was fixed and a spare from VSC is being checked for compatibility. For the medium term this is resolved. Action closed.
- Multiple events on 19/11, which look to be due to investigations by the vacuum team. However, one ITL sector valve needs a compressed air distributor repair (by VSC).
- OASIS 7.5.5 was tested, and looks to work much better.
- Source switched off for timing test this morning.
- Oven refill scheduled for 30/11, several interventions in parallel.
- LLRF: Could measure the beam with the new LLRF controlling the buncher. The correct pulse length and timing was set up. New phase could be found and the amplitude calibration data was taken, but could not be initially processed because data extraction from NXCALS was not possible. The state control of the amplifiers and breakdowns are still to be finished.
- Many tanks for TE-VSC for the spare source gas flow controller (E. Mahner and Richard Scrivens by chat).

Questions and comments:

- M. Pace commented that the Oasis viewer had a bug which made it very slow, it is corrected now after having deployed a new version.:-

Clear by D. Gamba:

- All going well, happy users.
- Mostly machine development was done last week.
- One problem with a klystron, already corrected.

LEIR by C. Wetton:

- Concerning the problem reported last week, SMB is in charge now of the consolidation of the floor.

AWAKE, NTOF, EAST AREA, HiRadMat: Nothing to mention.

3. AOB

Leak in TT2 by J. A. Ferreira:

- Failure of support between BHZ.377 and BHZ378. The fall of the support created a sudden movement on the other side of the chamber. Three bellows affected by the movement. There was a very poor welding of the support to the plate.
 - The bellow downstream BHZ.378 (TT2 side) is damaged. No other equipment affected, but cannot be discarded.
 - Proposed action list: Replace the 3 damaged bellows. Spare bellows localized and tested. Fixed DN160CF flanges available, 2x rotatable DN160CF also available. Some chambers are undocumented, drawing production started. Discussions with workshop to be started on Monday.
- No major issue for hardware commissioning.

Questions and comments:

- R. Steerenberg asked if there are sufficient number of spare bellows. The answer was affirmative.
- Concerning the support welding, J. A. Ferreira answered that it was a unique support, there are no similar ones with the same problem.
- E. Mahner pointed out that a vacuum leak like this propagates with very high speed and the sector valve toward the PS should be checked. J. A. Ferreira answered that it has been done.
- M. Delrieux noted that the BHZ can pulse and should be locked out if an intervention is needed.

Minutes by L. Bojtár