

Accelerator Complex Status

End week 45 (Monday 9 November 2020)

Technical Infrastructure (C. Pruneaux):

- A rather good week for TI.
- Statistics:
 - Close to 7'500 alarms
 - 792 phone calls (624 incoming, 168 outgoing)
 - 84 ODM created
- Events worth mentioning:
 - Monday 02.11 at 16:52, a demineralised water leak was detected in BB3, which will be checked during the next access.
 - Thursday 05.11 at 11:24, an evacuation alarms in UX15 was launched due to an error during maintenance work.
 - Saturday 07.11 at 21:36, a low-level alarm on a backup cooling tower in LHC6 was received. Filling was launched manually, while the piquet was called in. However, the pumps stopped shortly after and caused a stop of the cryo.
- Upcoming:
 - .
- Details: <https://wikis.cern.ch/display/TIOP/2020/11/09/TI+week+summary,+Week+45>

LINAC 4 (B. Mikulec):

- Monday morning PIMS1/2 re-conditioning after the observation of a phase drift (parallel PS+SWY access).
- Tuesday morning ABP test of different MEBT optics
- Dispersion measurements with the 3 different energy spread optics
- After the phase change of PIMS1/2, all the PIMS were re-phased on Wednesday morning
- Wednesday around 11am short beam stop due to TE-EPC intervention on MEQ59: in parallel UCAP update and implementation of quadruple-ppm operation of the last quadrupole in the LTB line to allow for a new LBE 'Easy-to-Dump' optics
- Thursday morning continue ABP MD with a selected MEBT optics; confirmation that even with a change of MEBT optics the transfer line optics can stay unchanged.\
- Friday morning successful energy painting MD; for a test of the complete process a few days of debuncher setup (RF team) would be needed, but all measurement data required could be collected
- Friday afternoon ABP MD testing the second selected MEBT optics

Planning for next week:

- Monday: ABP to select the best MEBT optics and implement it; ppm copy to all operational cycles
- Rest of the week setting up of all beam commissioning cycles requested by the PSB
- Finish SIS for PS stray field compensation to stabilise the trajectories in the Switchyard
- Friday: calibration of the LEP klystrons by the RF team.

PS Booster (A. Akroh) :

All the week activities:

- **BE-RF:** High Level Closed loop operation continued;
- **BE-OP:**
 - Continue the Hardware commissioning checklist;
 - POPS-B reliability run + troubleshooting the B-Train measurement issue on MD6;

Monday 02/11:

- PS-SWY access → Booster in Special Permit mode to allow POPS-B cycling;
- TE-MSK: Troubleshooting the B-Train issue on **Basic_cycle_450keV_PS (MD6)** causing POPS-B cycling with a ~**5300G** cycle instead of **11273G**;
- Dry-Run BCTTRIC, BCTFPS, BCTWD: The tests went smooth → BIS conditions to review because wrong → **action BE-BI expert**;

Wednesday 04/11:

- **TE-ABT + BE-OP:** Dry-run on the Ejection Kicker pulsing at injection (**BEX.MC-CTML @ C275**) in order to protect the Matching Monitor on Ring3 → Issue with the Samplers (Due to Master timing changed, fixed by Jean-Michel);
- **TE-ABT:** Fixed issue of the BI.DIS10 generator not pulsing and trip several times → Issue coming from an Expert property which was disabling the generators;
- Tested the Multipoles and orbit correctors in reliability run → Few issues reported and TE-EPC informed;
- Import of last optics for PSB Rings into LSA PRO. Added the latest PS Extraction optics (Dump, PS, HRS and GPS);
- Created the HRS **Basic_cycle_450keV_HRS** in the same way than GPS last week.

Thursday 05/11:

- **BE-RF:** Migrated all settings to **Basic_cycle_450keV_PS (MD6)** to allow BE-OP working on this cycle in parallel.
- **TE-EPC + BE-OP:** First test of the chicane bumpers with the newly defined **REF.TABLE.FUNCLIST** (test performed on BI1.BSW1L1.2):
 1. Still some problems running it on the real timing distribution.
 2. Test in simulation mode OK (Power Spry observation → Not possible on OASIS);
 3. We tested the reproducibility/stability of the signal and it looked fine;
 4. We did the LSA modification for all BSWs and propagated the ideal function;
 5. PPM copied on all **Basic_cycle_XXXX** cycles;

Friday 06/11:

- **TE-EPC + BE-OP:** Second test of the chicane bumpers: Observation on OASIS OK.
 1. Need to change the **BIX.W100-CT** to **BIX.W200-CT** to give enough time to FGC to load and play the pulse;
 2. The timing cables were mixed, e.g. changing BI2X.SBSW would affect the BSWs in ring4 → **action BE-CO**
- Concerning point 1) Ioan will push for the installation of a new FE next week to hook the FGC on BIX.W200-CT.
- The change will also require a splitting of the signal from the **Cruise Control and SIS** → **Discussion planned on Monday PM (Abdel + Tibor+ GP)**
- Concerning point 2), B. Ninet will look into it and fix it.

PS (K. Hanke):

- POPS commissioning in progress
- EPC in general good progress, some converters still need to be made operational for next week
- RF commissioning in progress
- Next will be magnet tests, two low energy correctors have electrical problem, being followed up

- A broken cable for one of the access points has been replaced, a DSO test needs to be redone and is tentatively scheduled for this Friday (t.b.c.)
- lots of access requests
- so far no showstoppers.

ISOLDE (A. Rodriguez):

- We finished the measurements we needed to validate the techniques we developed to characterize the longitudinal phase space of the beam in the linac. After the initial data analysis, we had to repeat some of them. Niels is analyzing the new data. But, we think we are done now. If we have time and for completeness, we may take a second batch of data at a different beam energy before warming up the machine.
- During most of the rest of the week, we were working in the injection of beam from the GPS separator into the REX-TRAP and the charge breeder. We are not done yet. It is taking longer than anticipated because the new GPS HT power supply is slightly different than the previous one and it is taking some time to match the injection energy into the TRAP. We think we will need most of this week to finish linking the whole chain (from GPS target to end of the HEBTs of the post-accelerator)
- In the low energy side, there were a couple of important interventions. We now can go up to 60 kV in the front-end after they installed the cover of the floating cable tray in the front-end Faraday cage. Also, we can now use the Faraday cup after the front-end that allows us to measure the total beam current coming out of the target.

ELENA (Laurette Ponce):

- Water leak in the source after intervention to exchange vacuum gauge and exchange the filament. This happened already previously so connection pipes have been exchanged.
- Problem of de-bunched beam observed last week fixed after an intervention on the B-train (we switch to spare system which was upgraded with a new version of the software). Work on-going to fix the main system.
- Optics studies in the TL progressing well: beam in Gbar centred in the 2 MCPs, sign convention problem between HW and MADX for electrostatic correctors, LSA tools deployed in LNE50 and LNE03, first trial of kick response measurement.
- Also, nice progress on machine studies: Test of acceleration cycle, test of re-bunching on $h=4$ for automatic bunch distribution and test of switching on of electron cooler magnetic system with compensation.

Linac 3 (Detlef Kuchler):

Linac 3 is in the hardware commissioning phase.

The source was switched back on last Wednesday and left conditioning.

Progress was quite slow as the source was still outgassing: a 40ua beam was observed at the end of the week after the RFQ.

The BCT located at the end of the LEBT is still not operational and an issue was opened with BE-BI. Also the exact value of the source main extraction voltage is not known for sure (problem related to the de-bouncer and/or the acquisition timing?).

The SIS HT Reset functionality was fixed by BE-CO.

The LLRF loop was tested and closed in the lab by RF experts, the system is ready to be installed soon at Linac3.

70% of restart checklist points are now completed (with checks on linac converters, stripper arms movements, RP measurements, HLRF/LLRF performed this week).

