Accelerator complex status

End week 35 (Sunday 31st August 2014)

TI (Jesper Nielsen)

The TI summary is on the wiki page as usual

https://wikis/display/SBX/2014/09/01/TI+Summary+week+35%2C+2014

LEIR (Django Manglunki)

LEIR restarted on Monday 25/8 in the afternoon after Linac3 leak detection following the pepper pot installation. Beam was accelerated with A.Findlay's help. Extraction to PS was not possible because of a controls problem in ETL & ETP transfer lines (several magnets prohibited from changing values). The issue was solved the next day.

On Monday 25/8 and Tuesday 26/8, F.Blas and team fixed some electronics cards in the transverse feedback.

The Ar beam started to be delivered to the PS on Tuesday 26/8 afternoon, with a usable intensity (1.5E10 charges/ pulse).

On Wednesday morning M.Cattin changed all control cables to the main magnet power supplies.

Beam was stopped on Thursday morning due to PS access. This stop was used by EN/STI to access the ETL line inside the PS switchyard, to investigate the feasibility of installing a new beam dump for LEIR in ETL.BHN10.

On Friday morning, LEIR was decoupled again in order to perform the radio protection measurements aimed at deciding whether to reopen the visitors platform during argon operations. RP's reply is expected before September 5th.

On Friday afternoon the extraction transformers were recalibrated by BI, showing practically 100% transmission between LEIR and the PS, but it currently looks like the PS is only injecting half of it.

LEIR stills suffer from inconsistencies between the LSA settings and the hardware, making trims hazardous and irreversible.

Now that the machine is coupled, the rest of the complex imposes a 29BP supercycle, forcing LEIR to use one ZERO 1BP cycle, ZERO or otherwise.

The ZERO cycle needs to be setup with the proper timings for Ar in LEIR and Linac3, as it currently prevents the following cycle from being properly executed.

The coming week will be devoted to sorting out these problems.

ISOLDE (Pascal Fernier)

HRS

Target # 510 UC2C ; Run @30kV

No official users this week: beam for Rillis adjustement (lasers) and pre-tests on LA1 line for next experiment; bad vacuum on this experiment needs to be improved.

Proton scan done for Rillis tests with 26Na

GPS

Target # 463 Pb ; Run @ 30kV for IS588 and 30kV, 20kV, 10kV for SSP

We had 2 experiments this week on RC4 line (IS588) and GLM line (Solid State Physics).

Test for Rillis Vadis (lasers).

IS588 took the beam until Sunday 16H00, then machine switched for SSP.

Monday morning target change on GPS and tests of the clamps of the front-end. GPS protons scan scheduled for Wednesday morning.

No serious technical problem this week; lock of the Jura door changed and controlled access is now available.

AD (Tommy Eriksson)

Since last Monday:

- Adjustments and setting-up/debugging at 300 MeV/c in the beginning of the week (e-cooling, RF capture, orbit corrections not yet with YASP so very slow…, tunes)
- Unstable conditions and repeated above until Thursday when we saw first beams at 100MeV/c with some signs of cooling.
- Thursday evening orbit corrector DR.DHZ2908 failed. Traced to bad/burnt connector on magnet. Repaired Friday morning. And now the machine is different again…..re-started orbit corrections and e-cooler beam alignment.
- Better orbits obtained Saturday
- Good cooling at 300MeV/c and good deceleration to 100MeV/c obtained Sunday
- Today we plan to look at 100 MeV/c; orbits and cooling
- A fair amount of time lost due to PSB/PS problems

Booster (Bettina Mikulec)

The week was focused on the preparation of the SFTPRO h2 beam, continue setting up the LHC25ns beam and providing beam to the users (ISOLDE, EAST, TOF).

On Thursday all beams were stopped at 6am for the technical stop. RP requested a radiation survey before giving access at 8am. Several interventions took place: BPMs, BCTs, BLMs, external condition recabling for BTY.BVT101, LL-RF recabling (switch to change between old and new beam control), intervention on Finemet cavity, magnet intervention, inspections (vacuum) etc. Beam should have

been back at 12am, but the C16 cavity tripped and was only back at 1pm. Then the MPS, LT.BHZ20 and BT.BHZ10 wouldn't restart. Finally we had beam again at 2pm.

After the technical stop we had to fight with new BI issues: BI.BPM10-V and LT.BPM50-H had huge offsets. In addition a polarity inversion had been introduced on LT.BPM40, LT.BPM50 and LTB.BPM20 (all hor.). Most of the issues were resolved on Friday afternoon, but for BI.BPM10 an access is required. There was also an acquisition problem on BTY.BCT112 and BTY.BCT325 - the ppm calibrator seems not working correctly - the BI specialist changed to global calibration mode.

Still on Thursday evening BT.QNO30 tripped several times. The piquet PO was called, but couldn't be reached in the beginning ('the phone is not available'…). Half an hour later he could receive the phone call, came in and fixed a bad contact in an auxiliary power supply. 1h45m beam stop.

Throughout the week the LL-RF specialists were fighting with losses in ring 4 before extraction, in particular for the SFTPRO h2 beam, but it is also difficult to stabilise h1 beams on ring 4. On Friday they observed that the gap relay for Finemet cells 9&10 was not working; when closed there were ~700 V induced. Still they believe that this is not the cause of the ring 4 problems; they will intervene at the next access possibility. Out of ideas concerning the ring 4 losses on SFTPRO h2, they will continue investigating with new energy this week after a good weekend rest.

Friday evening at 8:20pm 3 sector valves closed in the BI/BT vacuum sectors and couldn't be re-opened. The vacuum piquet found a rack being off - he had to exchange a fuse to restart it. Beam was back before 10pm.

Saturday early morning the distributor on ring 4 tripped. This had announced itself already on Friday. The PSB continued providing beam with the remaining 3 rings before calling the piquet kickers in the morning. Ring 4 was again functional at 10:30am.

PS (Gabriel Metral)

The week was dominated by a problem on one of the PS extraction kickers (KFA21) that developed a problem, which initially took quite some time to diagnose and which will need up to two week to be solved. The problem lies in a design issue of the multi-contacts for the PFN. In the meantime all fast extractions that were setup to use the dummy septum (TPS15) have been reverted to the 2012 settings and the TPS15 was retracted. The absence of the KFA21 will also nearly stop the progress on the setting up of the MTE. It was decided that the PS will now setup the full-blown CT extraction for the first weeks of North Area physics. Once the KFA21 become available again, the setting up of MTE will continue and a date for delivery to the SPS will be decided in due time.

On the positive side the Ar. ions form LEIR were injected on Tuesday evening and by Wednesday morning they were accelerated and extracted from the PS. However, the RF manipulation still remains to be setup.

For more details on the PS we refer to the PS machine supervisor minutes:

https://edms.cern.ch/nav/P:CERN-0000077383:V0/P:CERN-0000112714:V0/TAB3

SPS (Verena Kain)

- Dump kickers MKDH/V and injection kickers MKP conditioning will not be finished for 8th of September. And the energy tracking system commissioning can only take place afterwards. Final voltage for MKDV will be 44 kV (more than in 2012: 41 kV, but less then nominal 47 kV). Sufficient with margin for Q20. Estimate for first beam: 12th of September.
- DSO test of chain 2,3,4,5 and 1 was successfully carried out on Wednesday and Thursday last week. The DSO has signed the beam permit.
- It has to be mentioned however, that the DSO test had to be interrupted to provide a missing cable between chain 1 and BHZ in TT2. Consequence of cabling campaign in LSS1, TT10.
- There are also other problems with cables for ring BLMs and special BLMs in LSS1. Still need cabling intervention next week.
- Despite a large number of access during last week for cleaning, RP, BI, vacuum, CV, etc, there are still a few remaining tunnel interventions for next week (floor painting, BLMs, etc.).
- We could pulse the main circuits from the control room in different configurations for first time. Big step ahead. The system is however not fully debugged yet. The main circuits still trip after a few hours of operation due to "dV/dt errors", mainly the main quadrupole circuits. Also the acquisition card for the main circuits is not working yet.
- We also started to debug the various inputs to the BIS around the ring (collimators, BLMs, FEI of mains, …). We found already several issues within the tested inputs. Debugging will continue next week.

Next week:

- EPC will continue debugging of main circuits and work on MST in LSS2 (and other circuits).
- Test of all operational cycles
- Test of coast
- Test of all beam interlock system inputs (also vacuum valves). Start debugging software interlock system