

Accelerator Complex Status

End week 33 (Sunday 17th August 2014)

TI (Peter Sollander)

Short summary from TI in the usual place:

- Tuesday, August 12, 22:10 – Water station in PS stopped. An unfortunate human error during intervention stopped another water station for the night causing the PS to be down for the night and most of Wednesday. The problem is now understood. Operator training and diagnostics tools will be improved
- Wednesday, August 13, We got information about white foam in the reject water in LHC Point 6. Investigations are ongoing as far as I know. The fire brigade and the environment people handle this issue.
- Thursday, August 14, 17:49 – Short-circuit alarms on UPS in LHC point 6. Cryogenics stopped. Power back on by 19:00, but some communication problems with WorldFIP remained. The CCC operators had trouble finding the BE-CO specialists for this problem, but finally got hold of somebody at 23:15. Intervention by BE-CO and EN-ICE finished at 02:50.

LINAC3 (Mike O'Neil):

The machine has been running well and there are no major problems to report.

LEIR (Michael Bodendorfer):

We have created a bare machine setup with the only elements required to run the machine:

- ER.BHN (Main bending magnets)
- 5 main quadrupole families (set to produce constant 1.82 and 2.72 tunes)
- ER.DFH injection pump (these are four fast dipoles, necessary for the multi-turn injection)
- RF cavities

Note: We now use no skew's (quads, sext.), no sextupoles, no corrector dipoles, no electron cooler toroids, nor any electron cooler solenoids.

We accumulate about 50% of what we can expect from an ideal scenario. We keep this intensity until RF capture, where most it gets lost within a time span of about 100ms. Note: the beam is uncooled, hence retains its original large momentum spread - hence RF capture is not expected to be successful at this point of the restart.

The machine reproduces a programmed tune of 1.82 (H) and 2.72 (V) as measured 0.8 (H) and 0.63 (V).

There were numerous trial and errors with cable changes and oscilloscope tests on the main power supplies have shown that the digital signal transmission between GAFs and power supply is sometimes faulty, producing spikes on top of the programmed GFA function, and interpreted by the power supply to produce a low-pass filtered oscillation in the current, sent to the magnets.

We observed on OASIS, the output of the power supply for the BHN main magnets that it does not conform with the stability requirements for the machine. This information is partly contrasted with power supply measurements, which show a different, more optimistic picture. We are investigating this issue.

LINAC2 (Mike O'Neil):

The machine has been running well and there are no major problems to report.

PSB (Klaus Hanke):

Throughout the week we tried to increase the intensity on the ISOLDE beams by optimising steering and resonance compensation. This was difficult as we found that the transformer read-out on the Operation Display is inconsistent with the Oasis signal, probably an issue of gating/timings which needs to be understood and fixed first.

Work has also been done on setting up h2 SFTPRO, STAGISO and a large emittance beam for MTE.

Main issues of the week:

Tuesday kicker problem (BT2.KFA10&20), took many hours for the expert to identify and fix it (bad connection in a pulse repeater).

Wednesday 14:00 there was a 2h scheduled stop to allow the EPC group to do powering tests with the main quads. EN did in parallel tests of the beam stoppers, which made that the stop was slightly longer than the scheduled 2h. It was confirmed that the beam stoppers of the PSB are working correctly.

Thursday trip of BTP.DHZ40, required piquet intervention.

Saturday early morning the TFB went down with a water fault; the expert came in and fixed it.

Sunday evening during 20 min all acquisitions stopped; INCA support did not answer the phone, eventually E.Roux could be reached who told us to restart the INCA server.

ISOLDE (Didier Voulot and Eleftherios Fadakis):

HRS

Tuesday: Target UC509, bunched beam from ISCOOL to CRIS and stable beam.

Wednesday: ISCOOL set up in bunching mode.

Thursday - Friday: Proton scan and tape station test (For further information concerning the tape station: a presentation on the tape station issue was done by Alexander Gottberg (EN-STI)

[https://edms.cern.ch/file/1342397/1/Gottberg_2014-08-](https://edms.cern.ch/file/1342397/1/Gottberg_2014-08-12_Tape_Station_Problems_compressed.pptx)

[12_Tape_Station_Problems_compressed.pptx](https://edms.cern.ch/file/1342397/1/Gottberg_2014-08-12_Tape_Station_Problems_compressed.pptx)) Air activation and RP tests were

foreseen for a MEDICIS target but were cancelled due to steering problems on one of the deflectors in the BTY line (deflector had an inverted polarity).

Monday: Intervention on tape station

Problems with the mass control for both magnets, one could not reach the field required and had to restart the FEC(cfc-197-thrsmag) in order to make it working. Problem was followed by EN-STI and TE-MS, situation still not stable enough and I shall ask them again today to further investigate.

There was an HRS timing synchronisation missing and is now corrected.

The original patch panel configuration for HRS was restored.

GPS

Target #508-Re, parallel collection at GLM/GHM for IS528 occasional stable beam for IDS.

Tuesday: GLM/GHM deflector controls, correct limits and interlocks configured and tested. We had problems with them during this Friday and Saturday and I shall ask EN-STI to look into it.

GLM vacuum pump exchanged.

The line/target heating+transfo+HV was dropping repeatedly over the weekend. It was a penning gauges problem which was solved by TE-VSC.

Infrastructure

- The brake of the tape station was replaced on Monday.
- Water cooling stopped on HRS on Monday morning.
- There has been an ERD2 power cut (170 R-020) by mistake on HIE-ISOLE work site. This caused the two FECs in 170 R-020 to crash (cfc-170-rplc and cfc-170-arexplcgw). Also GPS.MAG70 went down and REX linac vacuum needed restarting. At EBIS the main platform power breaker dropped and needed re-arming. EBIS vacuum pumps stopped and has been restarted.
- On Wednesday we lost all controls (working sets + applications) for 1 hour. BE-CO solved the problem but I asked to be informed on what exactly was the problem.
- RC2.QS40 was found short-circuited. BE-BI opened and found a large piece of aluminium at the origin of this.

Safety

The thresholds of two RP monitors that were giving unjustified alarms at the RILIS barrack and route Democritos were raised.

Here one can find the minutes of the last ISOLDE technical meeting:

https://edms.cern.ch/file/1342397/1/minutes_2014_08_12.docx

PS (Jakub Wozniak):

The PS can now deliver the three operational beams EAST, TOF and AD with nominal intensities. Start of the week was problematic with problems on Sunday evening with a vacuum leak. End of the week and weekend was quite good with all the beams delivered as expected.

On Sunday we had a large vacuum leak in SS70, KFA71-79 ion pump clamp problem. No beam until Monday evening, sublimation was done but pumping was rather slow.

Vacuum interlock coming from the pumps on the KFA around set to $5E-7$ prevented the full restart of all beams.

On Tuesday afternoon we had problems with PSB recombination kickers (timing module had to be replaced). Around 4h of downtime.

During the night POPS was interlocked with external relay fault, Magnet Water Flow which was not correctly diagnosed until Wednesday morning.

It was a wrong manipulation on the cooling for PS magnets by a member of the TI team when fixing the problem on EAST cooling. Resulted in around 10h of beam stop.

On Wednesday there was an MD for SMH57 RMS current and access for TOF and other zones. In the evening the SMH57 went down for 2h with a power converter problem.

There was also another problem with restarting POPS, which showed a 'Magnet Fault'. It was tracked down to a magnet temperature interlock that was due to a rapid rise of the temperature due to high load of cycles in the PS.

The regulation of the water-cooling can deal with it but it needs around 5-10 minutes of adaptation when PS gets restarted with high-energy cycles rapidly.

On Thursday morning we still had some issues with the vacuum valves in SS70. Some glitch in the vacuum pump caused an interlock for 30minutes.

PS also suffered for PSB MPS & dipole problem resulting in 1h30 minutes of no beam.

Friday was fine with the AD intensity increased to $1050e10$ & TOF around $600e10$.

Weekend went without major problems, only 2h of downtime due to KFA13 problems.

AD (Tommy Eriksson):

- During the week:
 - Some time lost (Mo: PS vacuum, Thu: PSB ejection)
 - S-cool set-up: BTF, gain, system delay etc.
 - Schottky system operational Thu (timing)
 - => first intensity measurements possible
 - Injection scans: => $2E7$ at 3.5 GeV/c with $850E12$ in PS
 - Main issues:
 - Strong perturbing signal observed on all 3 s-cool systems, GSM suspected. H and V systems heat longitudinally.
 - Injection BCT:s still not operational
 - Awaiting surprises at lower energies.....

- During Fri/Sat/Sun:
 - Injection BCT:s ok!
 - GSM system in ring is now switching on/off as it should
 - GSM system in hall: gain reduced by 25 dB to minimise perturbation. This is what we had in the past and it has mysteriously been forgotten.
 - Initial RF set-up for capture and deceleration from 2 GeV/c – 300 MeV/c: capture lossy and beam lost during ramp.
 - Much time spent on debugging stochastic cooling controls, electronics and u-wave circuitry.
 - Main s-cool issues: pickup movement has bugs in FESA-class, we use expert SW instead. Dynamic parameter controls: InCA problems with cycle editing.
 - Presently still debugging s-cool HW. Suspect inversion of attenuator and/or delay controls settings.
 - ~ 2E7 at 3.5 GeV/c with 8E12 on target
 - Beam lost between 2GeV/c and 300 MeV/c.

Last week the ad physics start was also delayed from 19/08 to 26/08.

SPS (Django Mangunki):

Between Monday 11th and Wednesday 13th, 3 magnets were exchanged (MBB11470 vacuum leak , QF12010 earth fault & MBB22290 water leak), the old dump TIDVG was removed and the new one installed; dump bake-out at 120°C is currently ongoing. During the transport of the TIDVG there was an incident where the drainage channels could not support the weight of the trailer, which became unstable and risked, capsizing. Transport resumed thanks to the use of steel sheets as floor reinforcements.

On Tuesday 12th the primary ion interlock for North Area was supposed to be tested. The test could not take place because of the magnet exchange in BA2: there was no water in the ring magnet circuit, which created an interlock inhibiting MST & MSE from pulsing. However thanks to the preparation of the test, MSE and MST power supplies are now ready.

On Thursday 14th an earth fault on QD circuit was repaired (faulty busbar clamp in 119). On the morning of Friday 15th, the HV tests were successful.

Next week:

- All main magnets should be ready for pulsing this Monday 18/8 using LSA references
- The broken wire of wirescanner 519 will be repaired on Monday 18/8 over lunch time
- A water leak has to be fixed on the MKP, tentative date Thursday 21/8 (tbc) as the main magnet water circuit in BA1 has to be purged.