

End Week 36 (September 7th) – Status of Accelerators

Summary

ISOLDE	Reasonable week
LINACS	Quiet week without problems
AD	Reasonable week, beam availability limited by injectors
PSB	Reasonable week with some problems
PS	Troublesome week 1.5 days without beam due to main magnet busbar insulation and powering problems.
SPS	Very little beam for SPS due to injector problems.
TI	Quiet week.
LHC	

Linacs (F. Gerigk)

Linac2:

After the fix of the vacuum leak on tank 2, beam was back on Monday night. The temporary fixture of the cloche for differential pumping, which was put around one end of the leaking RF coupler T-piece, is still in use. A permanent fixture has been constructed is ready to be put into place as soon as there is a shut-down for a few hours. Otherwise a quiet week.

Linac3:

A number of times the beam from the source was not very stable, each time the problem was quickly solved by retuning the source parameters. At least 2 instances where a problem with the chilled water supply tripped the RF (incl. source). Each time the RF and the source could be restarted quickly.

PSB (K. Hanke)

Monday 31 August

Were still down with Linac2 vacuum problem; in the shadow some minor interventions (but no access) which were on the waiting list.

During the night the situation with the linac improved (earlier than anticipated) and beam was back in the PSB as from 00:41.

Tuesday 1 September

In the morning another access to Linac2 (45'); in the shadow tests on BE.SMH (no access).

Wednesday 2 September

ISOLDE requested high intensity on GPS; MD3 was checked for SPS MD on Thursday (which was then cancelled).

There was a problem on the Ring3 C04 cavity. Called Freddy Blas, he suggested increasing the plateau at the end of the cycle, which made the ring3 C04 more stable.

On NORMHRS, the last BLM (BTY.MBL310) was saturated; tried to correct the ejection steering. With the help of the SV the optics of the BTY could be tuned such that high intensity beam passed with acceptable losses. It is worth noticing that there were occasionally bad shots, for unknown reason. Nevertheless the beam was given to ISOLDE for the proton scan.

Thursday 3 September

At 04:30 PS MPS down (ground fault on bus bar); ISOLDE was not requesting the beam, so there were essentially no users in the PSB.

Friday 4 September

PS still down; ISOLDE started taking HRS beam in the afternoon; hampered by PS access. First problems with BT1.SMV10, but resettable. Later losses in the BTY line, could be related to malfunctioning of BT1.SMV10. While the specialists were working, we delivered rings 2,3 and 4 to ISOLDE with reasonably good intensity. The septum was back 23:45.

Saturday 5 September

Again BLMs in the BTY line. This time the problem could be tracked down to the ring 3 C04 cavity, which has spikes towards the end of the cycle. This affected also CNGS beam. The cavity expert was called and changed a few settings, since then stable.

Sunday 6 September

In the morning again losses caused by the ring 3 C04 cavity. The expert was contacted and advised us to reduce the intensity on ring 3 slightly whenever the problem occurs. He will check with other RF experts on Monday. However we can deliver good intensity on all users.

ISOLDE (E. Piselli)

GPS

Tuesday:

Beam to users.

Wednesday:

Called at 1.44 because target and line were off. I had to reset a PLC in the HT room.

Called again at 3.30 because HT was off. I had to reboot a dsc.

Beam to users till 8.00 when they have finished their experiments.

Friday:

Target cooled down. Target change on Monday.

HRS

Tuesday:

Separator tuning with stable beam.

Wednesday:

Proton scan done in the morning and stable beam tuning to REX in the afternoon.

Thursday:

Called at 8.00 from GPS users because of a water leak in Isolde hall. It was due to condensation water coming from air conditioning system. I have called TI operator...they have sent a company to check it.

Continuing with stable beam tuning.

Friday:

No protons during all morning.

Protons to Isolde from 16.00 till 17.30 when PSB has started a new steering because of a beam loss in BTY line.

Proton beam scan done again at 21.00 and radioactive beam back to users at 22.20.

Saturday:

Radioactive beam to users.

Sunday:

Radioactive beam to users.

Called at 16.00...users didn't have beam. I found one of the separator magnets not working and was necessary a reset of the system. Beam back to users at 16.40.

Called at 22.20...users didn't know how to remove a faraday cup...I helped then by phone.

Called at 23.00...users didn't have again beam. I found the main beamgate closed. Once opened users could continue working.

PS (R. Steerenberg)

The PS had a troublesome week, which started without beam due to the vacuum leak on the LINAC2 tank and which was followed by many small problems on various equipments, once the beam was available again around midnight from Monday to Tuesday.

Thursday morning around 4:30 the PS MPS tripped on a regulation fault and a difficult fault search was started. During the search for a problem on the MPS we asked the magnet people to make a high voltage test on the PS main magnet circuit, during which an earth fault (35mA at 500V) was found on the lower coil circuit. This earth fault was later traced back to a broken insulation on one of the bus-bars connecting the main magnet 22 with 23. A temporary fix was made and tested by means of several high voltage tests. After reconnecting all the magnets again and mounting back the covers the machine was ready to start again Friday around noon. However, during this restart the MPS suffered still or again from a problem. Investigations lead to two distinct problems: 1. a broken (burned) 15 V power converter in the thyristor firing electronics and 2. a broken thyristor, which required replacing an entire thyristor stack. These interventions were finished around 20:00 when the first magnetic pulses reappeared. Unfortunately the beam could not be accelerated as a course

tuning cable of a group of 10 MHz cavities got disconnected and required an intervention of the low level RF piquet. Finally beam was available again around 21:30. By that time many of the experimental physicists had left and could not be reached to inform them about the available beam. As a consequence the East area beams and the nTOF beam production was inhibited until the next morning when the experiments were manned again.

During the time the beam was available we suffered regularly from the radiation alarms that are caused by bad or not pulsing of several extraction elements due to front end overload problems. This long standing problem now requires close attention and should be given priority as it is activating the machine unnecessarily.

Over the weekend it was rather smooth running for the PS, apart from a gap relay change that require a beam stop of 45 minutes. and many measurement and adjustments for the MTE were made by the operations team.

The simultaneous break down of the bus-bar insulation, thyristor and the 15V power supply is not fully understood.

Ions in PS

Nominal beam available from RF point (4 bunches spaced by 100 ns) but not the nominal intensity.

SPS (E. Metral)

The SPS did not see much beam this week due to 2 main problems: the vacuum problem in LINAC2 (RF feeder loops on Tank2) at the beginning of the week and the earth fault on the PS bus-bar between the magnets 22 and 23 at the end of the week.

The ions came back on Monday evening (~ 19:00) and the proton beams were back only on Tuesday morning (~ 01:20).

On Tuesday, we did a NA sharing adjustment on T2/T4/T6 (60/45/140) increasing the intensity from $1.5E13$ /batch to $1.7E13$ /batch.

On Wednesday, the SPS Page-1 was not updating the intensities. After debugging by use of the logfile it became clear that SX.S-FTOP-CTM/CCV and SX.BEAM-OUT-CTM/CCV were not available. These values are used for the calculation of the flattop time. In case the TGM is not distributing these values the page-1 intensity values are not shown and become blocked.

On Wednesday also, we also replaced the 4th CNGS1 by a CNGS2 to study the PS MTE extraction. Looking at the FBCT in TT10 it seemed there was more than a factor 10 between the core and the islands, while looking in TT2 it was closer to a factor 6. Furthermore, the losses at PS extraction were bigger than usual, and might be explained by the presence of the 40 MHz RF cavities used for LHC beams in the PS (to be followed up). We injected only the 4 islands (i.e. the core was dumped on the PS internal dump). The trajectory of each island (in TT10 and SPS 1st two sextants) was studied scanning the SPS MOPOS delay and the data analysis is ongoing. During this study, the old optics for both TT2 and TT10 were used. Since then, new optics were implemented, and this analysis should be redone.

On Wednesday night finally, the beam was not available between 23:44 and 00:50 due to the RF transmitters, which all tripped (Lines 1, 2, 3, 4).

On Thursday, the beams were stopped at 04:23 due to the problem with the PS bus-bar, and came back only on Friday at 21:58, first at low intensity and later at nominal intensities. We took the opportunity during this time to make the interventions/accesses necessary in the SPS:

- Access in LSS4 (T. Bogey), just before the kicker, on a position monitor (418), which measures the extraction bump (MOPOS monitor with 2 electronics in parallel, and the intervention was on the second electronics).
- MKP intervention (E. Carrier) to fix a cable problem on the heater.
- Change BLM crate in BA5 and 6 (J. Emery). This is particularly important for the UA9 crystal collimation studies in LSS5.
- Intervention on the dump kicker MKDH(3b) (W. Senaj), where strange waves form were discovered and diodes were replaced.
- Change of an acquisition card for the ZS spark (B. Balhan).
- Status with the SPS magnets:
 - MBA23230 needs to be changed due to a water leak, which is not accessible. Discussions ongoing to do this during a PS dedicated MD in week 38.
 - MBA22770 might be repaired. A local intervention (brazing) might lead to a worse situation. If not working, the magnet will have to be changed.
 - MBA30650 has a small water leak, which can be repaired.
 - QD13510 might be repaired. A local intervention (brazing) might lead to a worse situation. If not working, the magnet will have to be changed.
- Unusual losses were observed (J. Bauche) in BA2+, in position 224-225. This should be followed-up in beam operation to see whether we really have relevant losses there.

On Saturday, some time was lost due to several trips of the TRX2 (no beam between 16:38 and 17:45 due to the piquet's intervention).

Ions in SPS (D. Manglunki)

Not much progress on the ion front in the SPS during week 36 as the beam was really available on Tuesday and Wednesday:

- On Monday a Linac3 RF problem was solved at 15:00, the F16.BHZ377 could not be switched on before 18:00 when Rbac and other CO interventions prevented the SPS from taking the beam. The ion beam was then taken from 19:till 20:30, just to verify the modifications made during the day did not perturb the acceleration.
- Wednesday stopped early as the source became unstable at 17:30 - too late to call the specialists in.
- On Thursday (when the SPS was anyway not supposed to take the ions) and Friday the PS was down.

We now realize it would make sense to have a better coverage of the ion machines, and allow for a call of the specialists and piquet services even outside working hours. Ions were originally planned to be injected in the PS in week 31.

AD (T. Eriksson)

AD started up ok early Tuesday morning after the Linac problem.

Full intensity and stability was reached by Wednesday morning after some intermittent drop-outs of stochastic cooling amplifiers and ring correctors.

Restart after the PS fault(s) was completed at around midnight Fri/Sat.

A few stops occurred during the w-e:

- water cooling fault in ASACUSA area + electron cooler on Saturday evening
- pulsed power converters in inj. Line also Sat evening (FL)
- stochastic cooling power amps Sunday morning (op)
- ej. line dipole power supply Sunday night (FL)

TI (P. Sollander)

Fairly calm week for TI.

One major event on Saturday 5/9: Demineralized water problem (FDED-00048) stops AD for an hour and a half.

LHC

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CTF

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