

End Week 43 (October 25th) – Status of Accelerators

Summary

ISOLDE	Good
LINACS	Good
AD	Cool
PSB	OK – some issues – see below
PS	Good week
SPS	Good.
TI	OK
LEIR & Ions	Ions to LHC – excellent end to commissioning. Work continues in LEIR this week.

Booster (Giovanni Rumolo)

On Tuesday/Wednesday we had again last week's problem of BLMs triggering on CNGS, due to the extraction septum of Ring 4 (BT4.SMV10) pulsing to the wrong value. The problem was found to be caused by the temperature fluctuations of the cooling water from the PSB station, since this water is used to cool this septum. Due to the change of temperature, the current CCV value would drift to a different AQN value. The specialist made an adjustment for the affected PSB septum, and then he also adjusted a PS injection septum, cooled with the same water (SMH42). However, due to a miscommunication with the CCC, this change caused injection losses in the PS for about 1/2 hr, until the PS operators traced the problem down to SMH42 and re-adjusted its settings on all users (see report from PS)

Another minor miscommunication happened on Tuesday afternoon, when, at the end of the ion MDs, the SPS operators changed the super cycle without warning the PS/PSB crews. The PSB operator had to quickly re-arrange all the ISOLDE cycles and intensities to guarantee them about the same amount of protons they were receiving prior to the change of supercycle.

The new injection steering settings from R. Scrivens (week 42) were copied to other users (STAGISO, LHC75A, LHC25A). STAGISO was taken by ISOLDE from Friday on. LHC PROBE was produced from Friday on, throughout all the weekend for the LHC injection tests. We have also started using the wire scanners of Ring 2, whose PMs were exchanged during the last technical stop in order to fix a problem of stray light hitting them and affecting the measurements. First comparative measurements done on NORMHRS for two different intensities have shown a very good agreement with the SEM grid measurements. More measurements done on the user LHC25A later on during the week also confirmed that the WS of Ring 2 work reliably.

ISOLDE Emiliano Piselli

GPS

Tuesday: Beam to users.

Wednesday: Target change done in the afternoon.

Thursday: Stable beam and proton scan.

We had 2 small problems:

- in the target we found a small leak current between the line (ie cathode) and the 2 anodes. After a discussion with target specialist was decided to run like that. Performance has not changed much.
- Source magnet power supply was broken and it has been exchanged from PO first line piquet.

Friday: Target tests in the morning and beam to users from the afternoon.

Saturday: Called from users at 6.50 because there was not beam from 5.20. It was due to the magnet separator which was in a faulty status. I did a reset and users got back beam at 7.00.

Called from users at 12.00 because they had a vacuum problem in their beamline. After some manipulation we have restarted pumping again and they could restart taking beam at 12.45.

Sunday: Beam to users.

HRS

Tuesday: Target was cooled down.

Wednesday:

Same problem as in week 40: during target change the new target was not coupled correctly to the front-end. H. Vestergard had to do some operation. However, the sensor which detects the correct coupling does not give a readback any more. Since the target could be pumped, i.e. the correct coupling tested, the interlock was bypassed. The problem will be solved during the next ISOLDE shutdown, since only one more target exchange is scheduled before the end of the run. The whole front-end will be replaced by a new one during the coming shutdown.

In the afternoon there was an access in the separator zone in order to inspect vacuum system and to replace separator magnets teslameter. Unfortunately this replacement was not done because the plugs were different from the present system and the speed of communication was not known. Pictures were taken and a solution will be investigated in the next few days.

Started heating target in the evening.

Friday:

Started stable beam tuning till 10.45 when we found target and line transformers OFF.

This was due to a transformer module broken. It has been exchanged from J.P.Lopez (TE-EPC).

Restarted heating again target and line.

PS (Yannis Papaphilippou)

The PS had a fairly good week.

- Several problems occurred on Tuesday during the ion MD, including Figure of 8 loop trips (solved by the PO expert), cavity 46 broken relay gap (exchanged after tunnel intervention of RF colleagues), C80-08 found off and in local mode (solved by RF expert) and PE.SMH57 interlocked with an external fault (lost connection to the security chain application for 1h). The most difficult one, and which caused an overall 4h down time, was due to F16.BHZ377, which was found intermittently not pulsing in the ion cycles. Piquet PO and CO worked for the whole morning but the reason of the problem was not identified. Finally, the puzzle was solved in the evening: F16.BHZ377 is a double ppm power convertor (User + destination), i.e. the value of BHZ377FTS is used when the destination is the SPS and the value BHZ377D3 in all other cases (dump to D3). The beam is also damped to D3 when the LHC is master, as it was apparently the case for the LHC ion beams. An additional malfunctioning of MTG was found, as even if the SPSLHCION user did not have the to-LHC tag in the sequencer, the tag was generated automatically by the MTG. The CO expert solved this during next morning. The difficulty to diagnose the problem from the CPS side came from the fact that the new vistar is not indicating the users that are controlled by the LHC as previously done. CO colleagues worked for this addition later during the week.

- During Wednesday morning, radiation alarms were observed at injection (PAXS51), coming from problems with the ejection septum of PSB ring4. After the interventions in the PSB, the beam continued to be injected badly in the PS. Finally, it was discovered that the power colleagues have also optimized the convertor of the CPS injection septum, but without clearly informing the CPS OP crew. The modification resulted to the necessity of changing the current setting of the SMH42 in all CPS users.

- The beam delivered during the weekend for the LHC sector tests was stable, apart from a jitter of 10ns on LHCPROBE, already observed during Friday night. The problem was solved during the next morning by the piquet LLRF who identified a phase jitter between SPS RF and SPS Revolution trains, as received in the CB (2ns cable has been added to SPS REV).

- A further problem with 10MHZ cavity 11 tuning was solved by the RF expert on Saturday morning, in the shadow of the intervention in TI8.

- A problem occurring (since Saturday night) with the misplacing of the bunch in the AD bucket is still under investigation by the AD operator and the piquet LLRF.

SPS (Elias Metral)

The ions were taken in parallel on Monday to prepare the dedicated MD of the following day. There was some doubt at the end of the previous week about the quality of the PS vacuum and it was not sure that we could inject a sufficient intensity (G. Vandoni informed us that there was a local pressure bump close to the PS Fast Wire Scanner FWS64, which was recently changed). Eventually, the Tuesday dedicated MD could take place (even if delayed by numerous problems related to the PS ion cavity PR.C80-08, the switching magnet BHZ377 and the PS figure-of-eight loop) and was quite successful. The re-phasing could be checked with the dedicated cycle and a first trial of controlled longitudinal emittance blow-up led to encouraging results.

Still on Tuesday, the ventilation door PPV.TAG41 should have been installed but it was finally not done. Instead, some work took place in BA7 to replace the grilled access door PPGT12 with a solid ventilation door.

On Wednesday morning, a reduced intensity was injected on both SFTPRO and CNGS (the gain of BPMOPOS_4 had thus to be increased to be able to extract and the server kesca4 had also to be rebooted). The injection losses were traced back to the TT10 screen BTV1209, which was inside the beam. A normal situation came back after its removal. Also on Wednesday, a bug in the CBCM editor was found with the programming of the LHCIION cycle: there was no "TO_LHC" flag on the SPS cycle but the beam was still programmed to LHC. This issue was solved by Jean-Claude Bau. Besides, the MTE was taken on CNGS2 to allow RP measurements. Finally, at the end of the day, TI2 tests took place with protons: dispersion measurements, kick response measurements, on momentum and off-momentum.

On Thursday, the T2 wobbling file was changed from T2.009 to T2.013 at the request of Lau Gagnon and the Beamfiles H2.888 and H4A.120 were loaded. In the evening, 1 SFTLONG cycle and 5 CNGS were programmed.

On Friday, the power converter QM2117 (same as last week) was down for some time (perturbing the NA). The first Line came and diagnosed a lbalance problem before repairing it. At 16:01 ions were sent to TI8 (at the first shot) and at 17:48, the ions were down to TI2 TED. The week-end was devoted, as foreseen, to LHC injection tests.