

Accelerator Complex Status

End week 48 (Monday 4 December 2017)

The LHC stopped this morning together with the beams to ISOLDE, nTOF and East Area to prepare for the YETS. All other injector beams will be stopped on Monday 18th December.

TI (Chris Wetton)

On 27.11.2017 at 12:00, The Users in the TOTEM control room (CMS) reported a strange smell coming from an UPS. Following an investigation by EN-EL it was found that the batteries had started to overheat due to a failure of the three cooling fans. No alarms were seen in the CCC as the thermal switches in the UPS had not yet hit their limits due to a low UPS load.

On 27.11.2017 at 15:54, One of the cooling pumps for the ISOLDE magnet cooling circuit tripped due to a false signal being sent by the breaker terminal box. The resulting loss of flow caused the power convertors to trip, however there was no beam in Isolde at the time. The Terminal box will be replaced during YETS.

On 29.11.2017 at 00:45, The expansion vessel in BA81 went on fault due to a filling problem. This eventually caused the demineralised water station to trip at 01H30. The SPS stopped at 1H46. To allow the continuation of the physics despite an ongoing issue with the expansion vessel, the circuit was restarted at 5H00 with the on call service on site monitoring the water levels. An investigation was made during working hours.

On 30.11.2017 at 12H10 Following a trip of the control DAQ for the North Area Access, the North Area beam extraction was lost due to a loss of the EIS signal. The equipment specialist managed to restart the DAQ at 12H30. Alarms

Details: <https://wikis.cern.ch/display/TIOP/2017/12/04/TI+Summary+Week+48>

LINAC2 (Jean-Baptiste Lallement):

A tank1 quadrupole power supply front panel had to be replaced on Monday (20 min downtime). During the night from Friday to Saturday, a PLC dealing with the security of the modulator room and the access system failed. The diagnostic of the fault and the replacement of the PLC required the presence of 2 RF specialists (4 hour downtime).

LINAC3 (Jean-Baptiste Lallement):

A quiet week for the linac3 with only one source RF generator trip (on Sunday). On Friday, the LEIR injection efficiency was improved by adjusting the tank3 field amplitude.

LINAC4 ():

To come soon.

LEIR (Simon Hirlander):

In short: It was an excellent week for LEIR (100% availability), only minor problems. Beam was delivered to physics as expected.

Highlight: On Friday, the intensity was increased by more than 30% mainly by a manipulation of the RF indicating a degradation of the foil.

Details:

- Tue 28-11-17:
 - Small software issues with Tomograph due to an update in system solved: time event was not triggered correctly
 - MDs:
 - Nicolò B.: long. Instabilities on NOMINAL
 - Simon A. : curing losses on MDOPTIC
 - SIS Restarted devices: ITM.DHZ01, ITM.DHZ02, IA2.QDN01S
- Wed 29-11-17:
 - IPM on - strong influence on the intensity (nice screenshot in the logbook)
 - Optimization of EARLY, small issue due to wrong cooler settings, quick fix
 - SIS Restarted devices: ITF.BHZ12
- Tue 30-11-17:
 - Simon A. /ME set up of h1/h2 and h3/h6 cycles with some complications, now ready to be tested on PS
 - MDs:
 - Nicolò: Space charge studies
 - SIS Restarted devices: ITF.BHZ11, IA1.QFN07S
- Fri 01-12-17:
 - IPM on - strong influence on the intensity - orbit correction with DHV42.H
 - Optimization of the EARLY after decreasing intensity over last 12 days:
 - small tune correction (cause of losses at around 610 ms fixed)
 - fine tuning electron cooler gun voltage and EA.FGFREVCOR (RF -correction) to increase overall stability without affecting the intensity strongly.
 - Finally, a trim of the DB-amplitude in Linac3 by Richard S. increased the intensity by more than 30%. The foil seems to be degraded.
 - MDs:
 - Nicolò B.: Space charge studies
 - Angela H.: Second order instability studies
 - SIS Restarted devices: ITF.BHZ11
- Sat 02-12-17:
 - Nothing special to report
- Sun 03-12-17:
 - Nothing special to report
 - SIS Restarted devices: ITF.BHZ1

PSB (Vincenzo Forte):

Clearly the availability of 95% was dominated by the Linac2 long-lasting fault of Friday evening (plus a shorter one from LA1.QFN12), so in the end I would say that from the PSB side the week was not so bad, but quite good actually.

Without this Linac2 faults we would have been at around 98% of availability from a quick calculation.

ISOLDE (Erwin Siesling):

A very dense week with lots going on. Practically we have had everything up and running.

Fortunately we have managed to satisfy the users (again) and the week was apart from one serious breakdown very successful from the operations point of view as well as for data for the users.

At REX/HIE ISOLDE the last Miniball run on 28Mg at 5.5MeV/u from HRS finished on Wednesday morning at 9h after which the target was changed for the existing #618 UC and set-up started immediately to provide the VITO experiment asap with beam. In the meantime the RILIS lasers which were running for the HRS/Miniball Mg run now prepared for coming TISD run at GPS.

On GPS the target had been changed on Monday for a TISD MD (Target & Ion Source Development) with a VADIS oxide test target (#630 UO + MgO). Setting up there was also done very fast and since Wednesday when the protons became available from the HRS/Miniball run the radioactive yield checks at GPS started.

The central beamline has been shared between the HRS (VITO) and GPS (TISD) users and over the weekend at GLM some collections were done from GPS with the central beamline dedicated to the HRS / VITO experiment users.

In parallel to the above we had a few MEDICIS tests with their MONTRAC monorail system and on Wednesday a small army of international journalists came for a organised MEDICIS visit (by Thierry Stora, Richard Catherall, Ana-Paula Bernardes, et al.). Today/Sunday first irradiation of a MEDICIS target has been planned and we will hear the results of that tomorrow/Monday.

We also send for the first time a HIE ISOLDE Nitrogene beam from EBIS through the XT02 High Energy Beamline and through the ISS magnet. This test started without the ISS magnet powered up and then the beam profile and intensity were observed during ramping up to its nominal field of 2.5 Tesla. All went very well. The beam did change slightly position and shape but intensity remained and we are confident to be able to send beam possibly next year once the detectors have been set-up inside for first physics with this ex-MRI magnet at ISOLDE.

As mentioned before we had one serious breakdown: On Wednesday-afternoon the HT2 High Voltage power supply for GPS gave up. We swapped for HT1 from HRS to continue the scheduled TISD run and on Thursday-morning Jan Schipper and Thierry Gharsa managed to repair the failing HT2 and we could continue with minimal time loss the dense schedule. Many thanks to both of them.

Tomorrow/Monday 4th dec the protons to ISOLDE will stop at 6h. We will prepare the machine and ramp all down for the consignment of ISOLDE and cooling water stop (except for the raw water which will continue until mid-dec

for the cryo plant - warm up of the HIE cryo modules).

And with that a dense but very successful run 2017 will come to an end!

PS (Klaus Hanke):

All in all, a reasonable week for the PS with frequent trips of the POPS and the KFA71 throughout the week. Both issues are being followed up by the responsible groups. Although the down time associated to this is not too significant, both are long standing issues and need to be understood.

During the week-end there was a trip of the PE.SMH61 power supply (not resettable); the piquet and expert had to come in. In the end it was an issue with the controller. Overall down time 5 h. Some down time was also caused by Linac and Booster problems.

Other beams were delivered for the LHC MD and there is a lot of last-minute MD activity in the injectors as well.

AD (Bruno Dupuy):

Nothing special this week.

Just a small problem of water cooling on the Electron Cooler 2 hours without beam (Saturday from 6pm to 8pm).

- There is a known leak on the system and the refilling must be done often. From one supplement per month to one supplement per week, we arrived at 2 each week. It seems that the leak becomes more important.

- We also have a drop in performance on stochastic cooling. On 2x24 amplifiers, 4 horizontal and 5 vertical are out of service.

The end-of-year maintenance will be welcome...

SPS (Francesco Velotti):

Again a very good week for the SPS with about 93% availability for the NA. The main downtime was accumulated for PC issues in TT20, injector complex (PS) and main PC. The problem on the mains was caused by a recurrent issue - when the mains were put in full economy, the QF and QD switched automatically off and it was not easy to switch them back on. EPC control is investigating - to be followed up.

The rest of the week was very busy due to the LHC MD, change of energy for SFTION and re-start of AWAKE.

Despite the tricky filling schemes requested for the LHC MDs, all beam were delivered as requested with no major issues. A bit longer was taken to prepare the most cumbersome fill, i.e. 8b4e + BCMS + 50ns, as the 50 ns cycle was never extracted lately - this was fixed re-mapping this beam on the operational cycle and the fill was successfully completed. Also, due to the request of frequent injections of trains and single bunches to the LHC, the LHC cycles were run in parallel with the SFTION - this was possible as the voltage of the ZS was low enough (50 kV) to not have spark problems.

The energy of the beam delivered to the NA was efficiently changed to 95.6 ZGeV Wednesday morning, as requested from the experiments. Physics started at about 14:00 already, and running smoothly since then.

On Friday, the AWAKE zone was patrolled by the SPS operators, RP and laser experts. The deployment of the proton beam permit followed, allowing extraction since 15:00. The extraction setting up and the steering of the line was smooth, allowing the beginning of the commissioning of the proton-laser synchronisation. Here there were a few hiccups, which are now being followed up by the AWAKE experts. As consequence, no beam for AWAKE was requested during the whole weekend.

LHC (Jorg Wenninger):

The whole last week of 2017 running was dedicated to MDs, which went quite efficiently, with a rather high machine availability.