

Accelerator Complex Status

End week 25 (Tuesday 25 June 2018)

TI (Jesper Nielsen)

Thu. 21/06/18 at 09:42, Swisscom outage, impossible to use short numbers. Fixed after 2 hours by Swisscom

Fri. 22/06/18 at 08:00, Lost all connections to alarms screens and no data on TIM viewers. A "brooker" was the cause of the problem.

Sun. 24/06/18 at 18:00, Water leak in extension of EHN1. TI on-site to secure electrical installations. The leak was fixed by the fire brigade.

Mon. 25/06/18 at 05:48, Access problems in SPS and some alarm screens flickering in TI. SPS rebooted a process in TIM which solved the problem. Will be investigated further.

Details: <https://wikis.cern.ch/display/TIOP/2018/06/19/TI+Summary+Week+25>

LINAC2 (Rolf Wegner):

Linac2 is running well, only 3 interruptions due to: 1) the technical stop, 2) a upgrade/reboot of the central timing and 3) a short amplifier trip this morning.

Details:

- During the Technical Stop (19-20 June) the Hydrogen bottle was replaced, the HV column was cleaned, the source water cooling, tank distance and cooling flow were checked. Tests were performed on the RBHZ20 and BHZ30 power supplies.
- TI got a water leak warning on 20 June which luckily turned out to be only a side effect of a changing water demand for the restart. No leak seen.
- On 21 June there was a 20 min stop for a reboot of the central timing.
- This morning the Buncher 2 amplifier tripped and could be restarted by the PSB operator (13 min down time).

LINAC3 (Rolf Wegner):

Linac3 itself is running quite well, however there is trouble in capturing the beam in LEIR.

Details:

- During the Technical Stop the oven was re-filled, 8 new stripper foils were installed, the pepper-pot emittance meter was removed, the spectrometer vacuum chamber was endoscoped and an RF tube on tank 3 exchanged.
- The beam was back on 20 June in the morning. However LEIR has trouble in capturing the beam. Richard found that the phase of tank 3 was wrong after the tube exchange. This was caused by a problem with the control PLC and a LLRF card that did not recover the reference phase. After the re-adjustments the injection problem into LEIR still remains. Richard is working on it.

LEIR ():

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PSB (Alan Findlay):

In a week dominated by the technical stop, when the PSB was running, it was running well with 97.5% availability.

Beams were switched off according to the agreed schedule from Monday evening into Tuesday Morning. The electricity distribution test for the PSB building was carried out early Tuesday morning, and no problems for the machine operation with beam were observed. However, the principal PSB access point YEA.01=PSB was on the circuit that was cut, it remained functional until the UPS ran out of power, then this went down, making access impossible and losing the PSB patrol. The issue seems to have been understood and a solution is being discussed.

The machine was switched off at 07H00, but with the access problems, accesses were not possible until 09H45.

The wirescanner intervention went well, with vacuum declaring the PSB vacuum good for beam by 17H40. All the other interventions took place without incident and the PSB was patrolled by 19H45 on Tuesday evening. A number of issues were identified overnight and the appropriate specialists called the following morning to solve them.

By 11H00 on Wednesday there was high intensity beam back on 3 out of the 4 rings, with the other ring following soon after, once the commissioning of the new Q-Strip hierarchy with the new FGC convertor for BR1.QCF was completed.

A problem with the low intensity LHC beams stopped the beams from being correctly injected into the machine, despite the high intensity ISOLDE beam being injected without problems. Thankfully there were several PSB machine supervisors in the CCC at the time, and they identified that the problem came from the timing cascade used to trigger the distributor plus an interlock problem, so once this was corrected and beam requested in R4, the timing distribution for the distributor returned to normal for all rings.

All beams were available once more by 12H30.

The issue with the R2 TFB was identified as a broken pre-driver which was replaced. A connector that had an intermittent bad contact was also identified and repaired.

There were a number of beams checked and adjusted ahead of the LHC special runs, but no problems observed. There were, as usual, PSB MDs carried out and setting up of beams for future MD requests during the week.

PS (Denis Cotte):

Une semaine un peu plus difficile pour le PS. La disponibilité faisceau est de 88% sur la semaine.

Les faisceaux ont été progressivement coupés en prévision du TS1, Lundi matin pour le faisceau MTE puis vers 16h pour les autres gros faisceaux.

Ce même jour, un problème sur le bus de communication 1553 avec nos alimentations rendait difficile et aléatoire la production de faisceau vers la zone EST. Tout était de retour en début d'après-midi.

Mardi matin, pendant le TS1, une intervention EN/EL au bâtiment 271 bloqua tout accès au complexe PS pendant environ une heure. Le dernier accès du TS1 se termina vers 13h Mercredi.

Le redémarrage après le TS1 fut retardé et les faisceaux de retour seulement vers 20h au lieu de 14h.

La principale cause venait à nouveau d'un problème de bus de communication 1553, mais cette fois sur les alimentations du bâtiment 365 avec nos bumper d'injection et les alimentations de transition (doublet et triplet).

Sur la semaine, ces fautes de BUS1553 représentent environ 10h de temps sans faisceau.

Suite au TS1 on notera plusieurs interruptions de faisceau suite des problèmes High-Level RF (reset de cavités, changement de relai gap sur C10MHz) pour environ 2h sans faisceau mais aussi plusieurs déclenchements de POPS et des PFW (suite à des modifications durant TS1) pour environ 6h sans faisceau.

Vendredi, un retour sur les modifications effectuées sur le PFW pendant ITS1 nous a permis d'avoir une opération bien plus stable pendant le week-end.

Enfin, les faisceaux demandés pour le « spécial Run LHC » cette semaine sont prêt au PS.

ISOLDE (Simon Mataguez):

It has been a good week at ISOLDE.

On GPS. a new target was installed on Tuesday morning and we were able to deliver a stable beam for REX trap tests (BE/ABP MD). We installed a new target Thursday morning. The set-up has been done Friday. RILIS lasers tuning Friday afternoon. Short Sc collections for GLM/GHM Saturday. Today IDS took some shots on Dy .

On HRS, RFQ (cooler/buncher) (EN/STI) tests are ongoing. Tests started last week, and schedule for one week more.

On HIE-ISOLDE, All 19 super conducting RF cavities have been phased to deliver 96Kr/212Rn to Miniball IS644 for week28.

AD (Bertrand Lefort):

Last Friday afternoon the magnetic Horn used for focusing Pbars immediately after the production target broke down.

Varying pulse shapes as well as occasional HV-flashovers could be observed at the power supply and also at the exit connection of the junction box that connects the HV-cables from the surface building to the Horn strip-line.

Thanks to the efforts of everybody, the horn was operational again on Friday 22nd after replacing the junction box into the AD-TARGET.

Excepting this little "glitch" the "rest" of the week was excellent and AD is nominal again.

ELENA ():

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SPS (Verena Kain)

On Monday the beams were stopped at 7h30 to start the UA9 run. The intensity of the single bunch had to be reduced to $9e+10$ as the 800 MHz could not be used during COAST. An issue with makerules and actual beam processes still needs further investigation. The UA9 run was suffering from orbit spikes every so often coming from the dying magnet in 304. Nevertheless a large amount of data could be collected with their new/re-configured detectors and the team was reasonably satisfied.

Tuesday to Wednesday 12h00 was dedicated to TS1. The FBCT519 with the radiation hotspot was found to be mis-aligned by 12 mm in H and 5 mm in V. The faulty magnet in half cell 304 was MBB.30490 which was exchanged without any noticeable effect on the orbit at flattop. The MSE-MST sum interlock was put in place during the TS. 2 quadrupoles (113 and 620) as well as one MBA in 500 were found to be leaking, but could be repaired in situ. Aperture measurements will be required to see the effect of the potential aperture improvements at several locations in sextant 3.

Unfortunately all BAs except BA1 needed re-patrolling Tuesday evening, as doors had been forced everywhere. It took 5 hours.

The SPS was ready to receive beam for COLDEX on Wednesday at $\sim 15h00$ (14h00 was the scheduled time). The delay was due to issues with the mains, a sextupole (LSFC) circuit and a corrector circuit in TT10 (MDCV1029). Anyway no beam was available from the PS until $\sim 20h30$ (synchronisation problems with PS injection bumpers). COLDEX took finally beam from Wednesday evening until Thursday 12h30 with up to 288 bunches. The new MSE-MST interlock was tested without beam Wednesday afternoon. A reaction time of roughly 50 ms until the beam is dumped can be expected in case of an MST or MSE fault during slow extraction.

Beam was back for fixed target on Thursday at $\sim 14h30$. 7 circuits in TI 2 were found in fault needing local resets after TS interventions and a cooling water valve was also found closed on circuit RBI.22134 in TI 2. Thursday evening MBB.2505 went into magnet fault (issue on temperature probe) and needed an access to BA80.

Unfortunately SPS OP cannot create piquet impacts for BA80. The intervention had to be delayed by ~ 1 h because of this. This is currently being followed up.

All in all the start-up after the TS1 was fairly smooth in the SPS.

The weekend was then dedicated to physics production for the North Area and the preparation of all the beams required for the special runs in the LHC coming week. Calibration fill beams, vdM beams, 100 ns and 50 ns were all taken in the SPS and are ready for the LHC (clarification needed on emittances of calibration fill beam, emittances in the SPS $\sim 1 \mu\text{m}$).

LHC (Enrico Bravin and Stefano Redaelli)

TS1 week, with TS ending Thursday afternoon at 17:00 as planned.

Unfortunately the recovery was difficult (RF, QPS, EPC, LSA DB, etc) and the first serious 2b fill was only injected roughly 24 hours later. But even beam operation proved tedious with beam instabilities even with single nominal bunches, issues with RF interlocks (FESA3 migration that was not tested !!!) and with the longitudinal blow up in the ramp that stopped working on B1 Saturday. The issue with instabilities was related to the ADT sensitivity setting that was set to high - a hangover from the MD.

The first loss map fill for the vdm cycle was dumped in the ramp probably due to a OFB configuration issue. The rampdown did not proceed as expected as some circuits were left at high current. In an attempt to bring down the triplet, triplets R2 and L8 quenched, requiring a ~ 6 hours recovery.