

## End Week 45 (November 11th 2012) – Status of Accelerators

### Statistics

nTOF: <https://espace.cern.ch/be-dep/OP/PS/default.aspx>

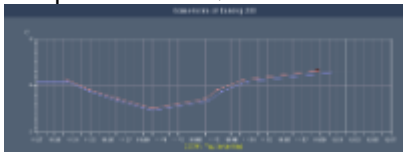
CNGS: [https://accstat.web.cern.ch/accstat/statistics/charts/2012/SPS/CNGS\\_Target\\_Cumul2012.jpeg](https://accstat.web.cern.ch/accstat/statistics/charts/2012/SPS/CNGS_Target_Cumul2012.jpeg)

LHC: <http://lhc-statistics.web.cern.ch/LHC-Statistics/index.php>

### TI (Peter Sollander)

TI summary of the week

<http://wikis/display/TIOP/2012/11/06/TI+summary,+week+45+2012>

day	events
Monday, November 5	<ul style="list-style-type: none"><li>A problem with the regulation of the chilled water in BA6, caused a trip of the SPS MST and MSE. See <a href="#">Major Event</a></li></ul>
Tuesday, November 6	<ul style="list-style-type: none"><li>Works on the heating plant caused an emergency stop to go off and stop the compressed air. Quick intervention by EN-EL and EN-CV saved the day!</li></ul> 
Saturday, November 10	<ul style="list-style-type: none"><li>Very heavy rain. Many buildings flooded, including SPS BA2 tunnel!<ul style="list-style-type: none"><li><a href="#">Major event for BA2</a></li><li><a href="#">SGX1 gallery flooded</a></li><li><a href="#">Compass flooded</a></li></ul></li></ul>

### LINAC2 (Rolf Wegner)

Last week was a bit more challenging for Linac2.

During the technical stop the following work was done:

- \* the H2 supply was checked: 180 bars
- \* the source high voltage column was cleaned
- \* the distance between the DTL tanks was measured
- \* magnets in the transfer line were inspected
- \* vacuum pumps were checked
- \* maintenance work on demineralised water station

Before the technical stop, the Linac2 source had an increasing number of missing pulses being even more frequent than 1/min on Tuesday morning. The problem was found to be an electronic card which sent a stop

signal directly after the pulse trigger signal. The card was exchanged, the number of missing pulses went back to normal (<1 / 5 hours).

The restart of the RF after the TS was delayed because water tripped from the roof into the high voltage modulator. The high voltage cage was cleaned, buckets were temporarily put in place. The roof is being repaired now.

Thursday night a breakdown in tank 1 caused a vacuum interlock. The restart was difficult. The RF specialist had to come in to find the problem and to restart the main PCL.

A few additional resets of the some equipment were needed during the week (RFQ and buncher on Tuesday morning, power supply LTL.BVT20 on Wednesday morning)

## **ISOLDE (Miguel Luis Lozano Benito)**

It has been a very good week at Isolde .Beam from HRS to users.

Some 111Ag collections on LA1 on Tuesday and 98Rb to miniball (REX) from Wednesday until Monday.

Only call from users because they had lost beam on Friday night. Beam was back after 3 hours.

No beam from GPS.

## **LEIR (Django Manglunki)**

LEIR was stopped at the beginning of the week, in anticipation to a possible intervention on the vacuum, and to the technical stop.

During the technical stop on Tuesday, the source was refilled, and the sublimation of sector 5 took place.

LEIR restarted on Wednesday morning. The rest of the week was mostly devoted to investigating unknown new features of the control system, in particular the CVORB function generators. The old version of their firmware introduces spikes in the function of the main bending magnet during the scrubbing sequence. The Controls Piquet and the CVORB specialist upgraded to the new version on Thursday morning.

Unfortunately the new firmware version creates other types of corruption which make it impossible to inject the operational beams, so we had to revert to the old one. BE/CO is working to provide a version that would work on all our cycles.

There is still some improvement needed in the injection efficiency as the intensity for both EARLY and NOMINAL is only about 80% of 2011's, but the life time on the flat bottom has been improved by the sublimation. The NOMINAL beam was used by the PS on Friday. As the scrubbing sequence is still not usable, the machine was left decoupled with NOMINAL cycles throughout the week-end.

Big thanks to Sergio Pasinelli for all his help during my week.

## **AD (Lajos Bojtar)**

### **Tuesday:**

- After the technical stop couldn't restart the power supply for the e-cooler's cathode.
- Called F.L, but they couldn't solve the problem. Tried to replace the power supply with the spare, but the high voltage connector was incompatible. Called the power supply's specialist, but he could come only next morning. Stopped machine for the night.

### **Wednesday:**

- The specialist managed to fix the original power supply around 12 am. There were several problems at the same time:

- The cathode power supply went off immediately when put on remote control. That might be related to the PLC problem
- The PLC control of the e-cooling system had to be reset.
- There was a hardware fault on the BBC2 power supply, fixed by G. Simonet
- The DADEPOW1 had to be restarted.
- In the mean time we discovered a problem with the stochastic cooling. In the horizontal plane it didn't cool at all. This was traced back to a false cable connection made during the T.S.
- There was a problem with the ejection septum, that was fixed around 16h15, beam was back .

#### Thursday night:

Ejection septum dropped several times. It was fixed and adjusted by F.L, no more problem after.

The rest of the week was calm with good performance.

### Booster (Alan Findlay)

Not such a bad week for the PSB this week, but a few issues kept us coming back for more.

Recovery from the TS started well, with patrols commencing just after 17H00 on Tuesday, and a couple of specialists & piquets required to get the beam back in the machine. We may have had beam in the machine, but it wasn't exactly getting a warm welcome, as it was kicked out on its ear after ~100ms of acceleration. A quick check of the PSBs vital signs, and we noted that the calculated tune from the samplers had a linear response throughout the cycle, despite the programmed tunes being decidedly non-linear. After a wee investigation, we found that there had been a bit of finger trouble when the MPS team had been working on the QDE & QFO supplies, and they had inadvertently connected the function for the QFO to both QFO & QDE, which had quite an impact, despite the intervention not being noted in IMPACT. The PiCO & PiPO were called in to fix the problem, and beam was ready for our dear users by 23H45.

By Wednesday it was apparent that the problems we'd been experiencing with the Stray Field Compensation (SFC) had disappeared much as they had appeared, without us understanding what the cause had been. However, this allowed an MD on the SFC to take place in the afternoon, to try to improve the stability of the injection trajectories measured on BI.U40 & 50. Data taking proceeded as expected, but the results showed that more studies will be required on this topic.

An MD was started Thursday to set up a measurement system allowing data taking in all 3 planes to investigate beam stability, above all close to extraction. This MD will continue over the next couple of weeks in coordination with the PS.

On Friday evening around 21H45 a fuse blew closing the vacuum valves in several sectors of the PSB, but the PiVAC, TI & PSB operators found the culprit, replaced it and had beam back by 23H30.

So the PSB is regaining her stability, and we were back in normal operation this week.

### PS (Gabriel Metral)

Redémarrage difficile après arrêt technique.

7H de retard pour produire les faisceaux suite au changement des générateurs de fonction des PFWs.

La cavité 40mhz endommagée s'est retrouvée après le TS avec son relay gap ouvert et elle perturbait tous les faisceaux (diagnostique difficile, le control indiquait que le relay gap était ferme)

Faisceau LHC de mauvaise qualité, la cavité 40Mhz en opération décrochait pendant la rotation de bunch LHC. Le spécialiste a trouvé des câbles volontairement déconnectés. Il précise que cette situation c'est déjà produit plusieurs fois cette année.

La machine a retrouvé ces bonnes performances depuis Vendredi

### **Lundi**

10 mn d'arrêt faisceau pour intervention sur MTG (pour la machine SPS)

### **Mardi**

Arrêt des faisceaux à 5H pour technical stop

Mis en place des CVORB comme générateurs de fonctions pour les PFWs.

Modification faite pour supprimer le problème des GFAs qui gênaient des pertes faisceau.

Alimentation du 1er step du BFA change par Luc Sermeus

BLM 31 & 75 remplace par E Effinger

Redémarrage très compliqué : les générateurs de fonction des PFWs ne marchent pas.

Une configuration de super cycle est trouvée avec laquelle les CVORB des PFWs fonctionnent.

### **Mercredi**

Les faisceaux sont instables en longitudinal. Le piquet RF est appelé

Les problèmes longitudinaux venait du relay gap ouvert de la cavité 40-78. (Relay affiche fermé dans l'interface control)

Nombreuses interventions sur DCPSRG1 pour essayer de trouver une solution au problème des CVORBs.

Toutes les protections thermiques des quads basse énergie déclenchent suite au multiple reboot de ce DSC.

Problème avec la cavité c10-56 réparée par Mathias

Problème avec alim ZT8.BHZ02 toute la nuit. Jean Luc blanc intervient sur cet équipement le jeudi matin.

### **Jeudi**

La cavité 40-77 décroche pendant la rotation de bunch.

Intervention de A Marmillon qui trouve des câbles déconnectés (Il précise que plusieurs fois déjà, il a trouve des câbles déconnecté)

Problème de tuner sur la cavité 40 qui oblige de la laisser pulser toute la nuit.

### **Vendredi**

Le faisceau AD est extrait avec le schéma de bump qui permettra l'installation du dummy septum en section15

### **Samedi**

Fin de matinée, Smh57 déclenche : problème sécurité en T10 'T10 CHAIN DANGER'

First Line et PIPO appelle par erreur.

Intervention du piquet acces et de D Chappuis pour test Secu

=> 2h30 d'arret faisceau pour EAST

POPs déclenche a 18H

=> 1h15 d'arrêt faisceau pour EAST

## Dimanche

Perte des conditions sécu de TT2. Le SPS

## OTHER

PA.HARM-CTM remplace par PAX.PLIDCD

Système de mesure RF (by group et by H) : souvent non dispo.

Injection des faisceaux LHC, EASTA et EASTB sur la montée du Bump !!

## SPS (Karel Cornelis)

SPS had a busy week with many problems. The MD on Monday had a delayed start, due to a problem with the timing. After a long investigation it turned out that non-PPM events like 'start cycle' or 'start super cycle' were disabled by what was thought to be an off-line software manipulation. Measures were taken to avoid this in the future. The first part of the MD was focused on 25nsec beam with very high bunch intensities ( $1.7 \cdot 10^{11}$ ). In the late afternoon we broke our last remaining vertical wire scanner (ws416V). This forced finally the decision to repair the wire scanners on Tuesday.

During the technical stop on Tuesday, the vertical and horizontal WS in 519 were repaired. The operation, which was estimated to take 24h, went very smoothly and was finished within the 12h technical stop and SPS was ready for beam at 20:00, as foreseen. Unfortunately, The PS had problems recovering from the TS, and we could only deliver beam to our customers on Wednesday morning.

Scraper scan studies, performed on Wednesday, revealed again the existence of non- Gaussian tails on the LHC beam, at the SPS injection platform. This might be correlated with the recent injection difficulties into the LHC.

After only a few scans we lost again WS519H. As a consequence of this, we decided to use the WS519V only at 26 GeV and, at 450 GeV, only when strictly necessary.

On Thursday we had a 10h UA9 MD.

On Friday the SPS suffered from problems with a sick TRX2, which were even enhanced by the commissioning of a Pb-cycle, which putted even more stress on the Rf amplifier. The RF amplifier was changed, but during the weekend, we kept on suffering from frequent RF trips.

On Saturday morning, a switch had to be replaced on the beam dump kicker, an intervention which took most of the morning.

Due to the heavy rain on Saturday, the false floor of BA2 started to be flooded by water coming from the surrounding terrain. In spite of the enormous efforts of the fire brigade to evacuate the water, the level kept rising and in the evening we decided to stop the SPS since the water was coming close to the cable level. During an access we than also discovered that the water was pouring down the shaft causing a flooding in Lss2. After midnight the water level under the false floor was under control and also in Lss2 the level was going down and the flooding was limited to region around the shaft.

Sunday morning Lss2 and BA2 were checked, and, although still wet, the flooding had disappeared. We then started to switch on everything, and found all the equipment working. At noon we were able to deliver beam to LHC and CNGS. Since we still had reports on flooding alarms in TT20- and NA service building we only resumed the beam to the north area in the evening, when all water problems were under control.

## LHC

Rather rocky week with low availability. Two major stops: cold compressors stop on Friday (24h); flooding of SPS BA2 on Saturday evening (16h).

<http://lhc-commissioning.web.cern.ch/lhc-commissioning/>