

End Week 43 (October 30th 2011) – Status of Accelerators

TI (Gerard Cumer)

17h53 Friday

Déclenchement du disjoncteur 66 kV alimentant le transformateur EHT102/1E au L1 sur un défaut du module contrôleur de gradins du transfo.. Ce module contrôleur a envoyé une fausse information de surtension qui a provoqué l'ouverture du disjoncteur.

Suite a ce déclenchement du transformateur, les sites L1 et L18 ont été partiellement hors tension, ainsi que la totalité du site de Meyrin.

Après 9 secondes de coupure, L'auto-transfert a réalimenté les sites L1 et L18 par la liaison 18 kV MP7 depuis le BE9 et le site de Meyrin par le réseau Suisse SIG. La boucle 18 kV LHC, les réseaux machine LHC, les sites SPS -ZN n'ont pas été impactés. ATLAS faiblement impacté.

Intervention du service de piquet niv1 et 2 EN/EL. Investigations ayant conduit au remplacement de ce module contrôleur de gradins. Manips retour sans coupure en configuration nominale terminées vers 1h00 du matin.

LINAC2 (Rolf Wegner)

Linac2 was running very well last week, no major problems until Friday evening. After the power cut Friday evening, a few problems had to be solved (opening of vacuum valves, waiting for cooling water and a few power supply restarts). From Saturday morning 0:30, Linac2 was running reliably again.

LINAC3 (Detlef Kuchler)

Last Monday after a source trip it was quite difficult to get back the source to operation. It took nearly the whole Monday. The rest of the week no problems.

After the power glitch on Friday source and linac were restarted on Saturday.

In the night to Sunday the source HT switched off. So the source had to be restarted and retuned on Sunday again.

LEIR (Maria Elena Angoletta)

The week started pretty well for LEIR. Beam was available to SPS on Tuesday and on Wednesday. On Thursday an MD took place to setup the LLRF for the user EARLY with the spare cavity (CRF43). This will allow being ready to accelerate the EARLY beam with the spare cavity, should the one currently operational (CRF41) get faulty.

On Friday morning the source was refilled and some beam was available again in the late afternoon. Although a bit on the weak side, this was extracted from LEIR and accelerated in PS and SPS, thus enabling validating the whole chain.

The Meyrin site was hit by a power cut on Friday around 20:00 on Friday evening there was a power cut in the Meyrin site that affected Linac3 and LEIR as well as the other machines. On Saturday many elements were restored to an operational situation thanks to the timely interventions of the piquet CO, piquet PO, extraction septa expert and damper expert. On Saturday evening the electron cooler was restarted as well, thus allowing to accumulate the beam.

On Sunday a fault on the powering of several PU racks was solved and the beam could be accelerated and synchronised. The LEIR injection line was optimised and a second injection was added to EARLY, so that 1.5 E10 charges were available at extraction out of 17 microamp of beam current from the Linac3. The extraction line had to be steered again but finally at about 21:30 on Sunday night the beam was available in the PS and ready to be passed on to the SPS for Monday morning's LHC MD.

ISOLDE (Emiliano Piselli)

Last week was not an easy one. We have had many problems with the target and then with the power cut on Friday. Unfortunately following these problems it was decided to cancel an experiment.

HRS:

On standby... nothing to mention.

GPS:

On Tuesday the broken robot calibration point has been dismantled and taken out in order to be repaired in the Isolde workshop. The day after we have put it back on place we have changed the target in the afternoon. Target was pumped and stable beam tuning has started in the late evening. We have worked till 23.30 because the target needed more out gassing and we could not tune beam with such low vacuum.

On Thursday morning we found the target with a vacuum still not at the operational value. After a discussion with target specialists we have decided to uncouple the target and change the O-ring, and check if everything was correct on the target cone...Before doing that we had then many problem to vent GPS front end. We could not manage ourselves and we called G.Vandoni. She was on holidays but she was very kind to help us for more than 3 hours to get things going. She has contacted S.Blanchard as well. In the afternoon we have removed the target from the front end. A water leak was found on it...therefore we decided to put onto front end an old target. We started pumping and heating in the late afternoon. In the evening the heating stopped because the vacuum went to high. It was decided to leave the target as it was.

On Friday morning we had a good vacuum...the system has restarted itself during the night. Unfortunately at the moment we wanted to restart the heating we could not monitor the actual pressure from the working set and from the target heating automatic application. We have contacted CO and then EN-ICE...and only after they have restarted a server at lunch time we could start heating target and line. In the afternoon we have tuned stable beam and at 19.50, when we were ready, we had a power cut in Isolde.

We have restarted all the machine in about 2 hours and at 23.00 we were ready to inject stable beam to REXTrap. We did some tuning and we deliver stable beam. We left Isolde at 2.45.

On Saturday morning target specialist came in to do a proton beam scan and yield measurement. I was called at 9.00 because he had some problem with the interlocks. I gave him instructions by phone. I came at 11.15 to improve the beam from Rextrap to Witch. Users could finally get beam at 13.00.

Beam to users all the weekend.

Booster (Jocelyn Tan)

Tuesday

While setting up the beam for the Wednesday' MD, all rings were set for the same number of turns (1.8 here) but we observed that there was less particles in the Booster injection line of ring 2. It was some timings BIXI.SDISPR which had a wrong setting, and have been corrected for.

Wednesday

No beam in the morning for a PS access.

During the MD2 set-up, our RF specialist found some issues :

*spikes in the C16 voltage, due to a faulty 10MHz clock for the C16 DLP. Replaced;

*discrepancies between CCV and acquired values of Qstrips : OP issue was sent

Friday

The beam was cut shortly twice by the Linac2 (RF tanks)

MD2, pure harmonic2 beam : $2 \times 250 \text{E}10 \text{ppb}$ in ring 3

There was a power glitch at 8PM.

The PIVAC was called for the LI.VVS10 which could not be open remotely.

The PIPO was called for restating a series of Linac racks

At 1:20AM TI gave the green light for restarting the MPS. Down time : 5h36'

But the PIPO was back again for some power supplies of some magnets in the BTP line which were down : 16 fuses had to be exchanged!! Additional 2h15' down time.

The PSB was back on its feet at 6:15AM.

Saturday

The ejection was found unstable, due to the power supply of BE3.DHZ11L1 delivering either 0 or 1.2A. OK after a local reset by the operator.

The Piquet First Line was called for a wrong acquisition on BTY.QFO108. He has reset the CPU. Down time for Isolde 1h08'.

Sunday

During the night, there were two RFQ linac faults, but the OP crew managed to solve the problem. Down time 10'+20'

Shortly after the extraction septum BE.BSW15L1 went on standby. It went on again after the fifth reset action.

PS (Simone Gilardoni)

The week of the PS was pretty good until the power cut on Friday.

Starting from Tuesday evening, we prepared the LHC50 ns with satellite bunches, that finally was delivered to the LHC on schedule. I understand that the LHC was satisfied with the beam characteristics.

We also regularly delivered all the normal operational beams, plus the LHC25 and the ion beams for the MDs.

Concerning the ion beams, we had few problems with the extraction and synchronization timings: sometimes the bunches oscillate at extraction. The problem could be solved by changing some synchronisation fine delays, but it needs some follow up because is not fully understood.

On Thursday morning we could not deliver any beam for about 1/2 hour because during an electrical intervention in the building 359, a power converter of a rack giving the status of some of our injection and extraction magnets was put in "consignation". It took a moment to understand the problem and ask for a "de-consignation".

On Friday evening we had a power cut. Basically all the machine went off as the rest of the complex. We got beam back at about 3:00 AM. We slowly recovered all the beams during the night. The EAST area beams could be delivered only on Saturday morning at about 11:00: the expert had to intervene to solve a problem with the interlock of the extraction magnetic septum.

Before the power cut, the ion beams were checked in the view of next week operation. Also the LHC100 ns was in good conditions.

The ions could be injected again only on Sunday evening. The extraction trajectories of LEIR were completely different than before the power cut, but thanks to M. E. Angoletta, C. Carli and the afternoon and night shift PS crews we could restore a good situation. We had basically to re-steer the LEIR extraction lines and the PS injection, starting from a beam that was not injected at all. The operation was pretty difficult due to the non-availability of the direct signals of the cameras of the screens at the end of the ETL line and of the injection septum: we could not be sure that actually the screens were in the IN position or not.

Concerning MTE, we started the island tests at 2 GeV and we continued to cumulate statistics for the fluctuations at 14 GeV/c.

SPS (Karel Cornelis)

The SPS continued running with four single bunches (2.5 to 3.0 10^{11}) on the CNGS2 cycle. The average duty cycle for CNGS was often reduced due to special LHC runs: 25nsec scrubbing in the beginning of the week, tests with satellite bunches, special probe beams etc. On other occasions the number of CNGS cycles was also limited by the CPS rotating machine. Wednesday there was a 24h MD of which 12hours for commissioning the long ion cycle. Due to PS problems and LHC filling, only four hours could be used and little progress was made.

LHC is now filling with 1.5 e^{11} protons per bunch. During the filling we sometimes have to reduce the voltage on the ZS to avoid sparking. This intensity is also at an unfortunate signal level for beam position interlock at extraction, which was giving trouble from time to time.

On Friday evening there was power glitch on the Meyrin side, affecting mainly the injectors. Proton beam was back on Saturday morning. The LINAC 3 and LEIR experts had to come in during the weekend to restart ions after the power cut. Ion extraction tests to LHC are planned on Monday.

LHC

Bitty week. 25 ns; high pile-up run; commissioning of IR2 squeeze for ion run; two cryo stops – one from transformer outage on Friday evening. Good running with peak luminosity up to $3.6e33 \text{ cm}^{-2}\text{s}^{-1}$ with $1.4 - 1.45 \text{ e}11$ ppb sandwiched somewhere in between. End 2011 proton physics 17:00 Sunday.

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