

End Week 38 (September 25th 2011) – Status of Accelerators

Power cut on friday 23/09 night 22:40 (Francois Duval)

On Friday night 23/09 at 10:40 a powercut affected Meyrin site stopping PS and booster. CC B513 was not seriously impacted as far as I know.

powercut duration was a few seconds only thanks to the "autotransfer" switching automatically meyrin network to the Swiss grid.

The cause of this powercut was another cable joint failure; MP5 link (main feeder to Meyrin site from LHC1) failed at LHC1. the only good news is that we did not face any problem with selectivity and with our automatic reconfiguration.

EL Piquet team plus additional EL forces reconfigured the network sharing Meyrin in two parts: general services are still fed from Swiss (less than 5MVA during the week end) and machine (will be around 25 MVA once PS reenergized) directly from Preveessin through MP6 link.

Network was Back at 1:00 then SVC and MPS have to be reset before machines resart;

MP5 joint will be repaired tomorrow Saturday if possible or on Monday before reconfiguring back the network to standard.

TI (Peter Sollander)

The TI Summary of the week in the usual place:

<http://wikis/display/TIOP/2011/09/19/TI+summary+week+38%2C+2011>

Quiet week except for the 18kV cable on Friday night and a problem for LHCb last Monday morning.

AD (Bernard Lefort)

Outline: Nothing new is to be reported this week: the overall reliability of the AD was good and the short down-time only came from the Stochastic cooling power supply which is a well known problem. The power failure of the friday night affected the AD as well as all the other CERN machine but had no more consequences than up-time loss. The power loss also coincided with my first week of piquet, and as they say: the proof of the pudding is in the eating...

Tuesday (late evening): Low ejection intensity detected (60-70% instead of $\pm 80\%$ on the TFA7049), no power supply failure detected, no GFA problem detected, no energy spread problem at the end of the flat-tops. The problem disappeared by itself just after opening the working set that shows the stepper-motors position (possible relation??!!) that controls the mobile plate sensors of the stochastic cooling. Total time loss: nothing but users received less of 1 hour of 60% intensity beam.

Wednesday: Some strange behavior of the anti proton bunch during RF capture at the end of the second slope (300 MeV/c). A tomography during RF capture shows that the bunch is not well formed, residual particles on both sides of the bunch could explain the loss of particles between 2GeV/c and 300 MeV/c. The problem could come either come from a Stochastic cooling problem or from a RF problem. Both specialists were invited to check their respective system. On the Stochastic cooling

side, the control specialist detected a 20% ripple on the power stage, the power specialist answers that the noise is identical on both power supply therefore it should not be a problem. A deeper noise study is still in progress and the conclusion are expected. On the RF side, nothing was detected all the systems work and the control signals seems all as foreseen. This problem has not generated any down-time.

Friday night: Power cut. Even if the power cut generates more than 8 hours of down-time, it do not had any important consequences on the hardware: Vacuum stay good and AD was operational again before being able to receive any beam from the booster.

During the night, I only had one problem with the target cooling pump that refused to work. After many attempts, I decided to woke up my co-supervisor (Sorry Bruno) that shows me that the main problem was my lack of experience. This particular pump has a weird reboot sequence that consist in doing RESET-RUN-RESET. The other system that refused to restart was the DR.MAIN and the DR.QUAD: the PLC get stuck and we had to call the first line in order to have it (deeply) rebooted. We left the installation a 8 AM, thinking that AD was ready for receiving the beam... but...

At 11 on saturday, a timing problem was detected. B. Dupuy (helped by T. Eriksson) noticed that I started some unused timing that skewed the AD cycle. He also called first line for few power supplies that shown an inconsistent behavior.

The machine was ready and fully operational for the beam at 17:57. Since then, no problem.

ISOLDE (Erwin Siesling)

HRS:

Using the present UC target to do stable beam tuning to the COLLAPS- (Bio beta NMR) and the CRIS experiments using the central beamline in close collaboration with the GPS experiments (sharing central beamline time).

GPS:

New UC target was tuned and p-scan done by wednesday after which the solid state (GLM, GHM) and online diffusion experiments (LA1 line) took beam.

REX from GPS:

Stable beam tuning to REXtrap in collaboration with the ongoing experiments to prepare for the upcoming REX run, Trap injection works however after the electrode exchange at REX EBIS last week there are problems getting the EBIS fully operational. To be continued this week. The REX run should start by tuesday-evening and it will be difficult to have the EBIS running by then.

Issues:

Major issue was the power-cut at the Meyrin side on friday-evening at around 22h40 bringing down the complete Isolde facility (water, vacuum, power, targets-heating, lights in the hall, all went down..). By 3h30 both HRS and GPS were up and running again, by 3h40 we got protons back from PSB (many thanks to Jean-Francois Comblin to get the booster up and running locally)

LEIR (Maria Elena Angoletta)

The weeks started well with a record-breaking fast refill of the source: on Monday (19 Sept) morning the refill was started and the beam was circulating in LEIR on Monday afternoon. The week was mostly OK apart from a few minor problems. On Thursday afternoon the LLRF malfunctioned for a short while, probably because of LLRF crate overheating. The problem was soon recognised and cured by rebooting the crate and increasing its fan speed. On Friday afternoon the injection efficiency dropped. In order to keep a reasonable intensity, a second injection was added to the EARLY beam. Optimisation of the injection process improved the situation on both NOMINAL and EARLY.

Friday night's power cut had a severe impact on LEIR; the power piquet as well as the septa expert worked on Saturday to restore the operational situation. Additionally, it was initially not possible to inject beam in LEIR as the security chain could not be modified owing to a controls problem, solved later by the CO piquet. The electron cooling system was the last to be restored to normal operation as the expert could come in only on Saturday night. After that, things went smoothly and we could get about 3.7 E10 charges available at extraction on NOMINAL and about 1.3 E10 charges available at extraction on EARLY.

Booster (Alan Findlay)

Mediocre week.

On Thursday around 17H35 the PSB safety chain tripped due to the PSB lift interlock, as it was indicating that the lift had gone to level -3 which is forbidden during machine running. Jean Francois went to investigate, and found that the lift did indeed seem to be down at level -3, and the PSB door was still locked and secure. He called the lift back up to the allowed level of -2 and checked to see if he could descend to the depths of -3, but he was not allowed, as we would expect. With the lift correctly interlocked, he patrolled the area to confirm that there was nobody there, and as all other doors remained secure, concluded it was the case. Resetting the interlock according to the procedure and starting the beam again brought the complex back up. All beams were down (including ions) for around 40minutes.

The issue has been reported to the safety people who have asked for a check of the lift by the persons responsible, but it appears to be a "freak" incident up until now.

The C04 cavities started playing up on Wednesday, but they simply required the "air flow" error to be reset and they'd come back on. As this also happened on Thursday and Friday, we contacted the specialist on Friday afternoon to warn him and ask his advice, since the weekend was looming and we wouldn't want to disturb anyone during the weekend, now would we? As a machine access would be required to investigate, we agreed to put him on the access list and wait for an access.

Unfortunately for Matthias, the cavities started to play-up again around 18H00 Friday, and it was soon obvious we were going to have to give him his access that evening, and so the wheels were put in motion to do just that. With the LHC filled and all parties informed the beams were cut at 19H50, the faulty "air flow detector" changed and beams back by 22H00, but not for long.

As you are well aware, on Friday the Meyrin power cut took us out (but not for drink) around 22H40, and the operator awaited the go ahead before re-starting all the equipment, which came

around 02H20. The machine was brought back up by the operator and piquets, and beam was available by 03H30.

After a few hours of relative peace, at 09H15 on Saturday the Distributor for R4 tripped and wouldn't reset, requiring specialist intervention. The specialists had been working overnight on other problems, but someone was available by 10H00, and a thyatron was changed and beam back on R4 just after 12H00.

The Distributor had not yet finished playing-up though, as at 13H30 the BIO.DISP went into fault and would not be reset, so the hunt was on for an available specialist to intervene. After the intervention of 2 specialists BIO.DISP was back in operation by 16H50, once they had changed another thyatron.

In between all the above nuisances we did manage to do some work, and got our beams out to the users so they could all get their fix of protons.

PS (Gabriel Metral)

Semaine sans problème jusqu'à la coupure 18KV du WE.

Ce WE 14H de coupure faisceaux.

Les cavités sont toujours le point faible. Plusieurs déclenchement des cavités 10Mhz (nécessaire interventions des spécialistes). La cavité C80-08 utilisée pour l'opération des ions, a elle aussi posée problème a plusieurs déprise cette semaine.

Plusieurs déclenchement de la MPS en début de semaine. Le palier 24Gev du cycle EASTB était trop long. Plus de problème après modification du cycle.

TOF travaille toujours en basse intensité.

Lundi

Remise en état du rack de control des grilles de TT2. Les mesures ne marchaient plus. Une carte électronique a du être enlevée puis remise dans le rack pour fonctionner a nouveau.

Mardi

Le calcul des emittances de TT2 se fait en utilisant un fichier qui décrit les optiques pour les différents cycles. Les ions étaient encore décrit derrière les labels 'SFTION et MDION'.

Une modif a été faite dans le fichier XML de description des optiques. Une lecture des optiques sur la database LSA devrait être installée.

Démarrage par A Marmillon de la cavité C80-08 pour les ions. Il était impossible de la démarrer en Remote.

Une série de mesure du LHC50 est faite emittance en changeant l'intensité par bunch (de $1e11$ a $2e11$ par bunch extrait)

Plusieurs déclenchement de la MPS pendant la nuit (arret de courte duree)

Mercredi

Discussion avec CO de la sauvegarde en référence des status des alimentations, des cavités, (status non ppm en general..)

C96 remplace par C11 puis remise en opération après intervention de G Lobeau

Une modification est faite sur le cycle EASTB pour réduire le glissement de la MPS. Palier 24Gev raccourci de 100ms. Ce glissement trop important était la source des derniers déclenchements.

Jeudi

MD éjection lente a 1.4Gev.

Ne pas oublier que F61 n'est pas une ligne vraiment PPM. (PPM autorise pour des valeurs proches)

Alarme radiation (étiquetage des câbles du DSC du timing d'éjection)

Dirac en faute pour 1/2h (intervention de first line sur ZT8.BHZ01 et 02)

Vendredi

Réparation de la cavité C80-08 par A. Marmillon (remplacement de relais).

A 20H : arrêt faisceaux pour accès PSB (rf pbl)

Coupure faisceau a 22H40 : problème sur un manchon d'un cable 18KV.

Samedi

Les accélérateurs du site de Meyrin sont alimentés par une autre boucle (réseau EDF) cette boucle est limitée a 1000A et depuis samedi midi, on est a la limite de cette boucle (surveillance permanente de TI). La réparation est prévue Lundi. Coupure des accélérateurs nécessaire au moment du retour sur la distribution classique.

Redémarrage EASTA, TOF et EASTC a 6H (8H d'arrêt faisceau). Seuls les faisceaux basse intensité passent (il manqué encore des cavités)

Vanne de la ligne ZT8 reouverte par l'équipe d'opération pour fournir le faisceau a DIRAC

Problème de connectique sur la distribution du TFID dans le chassis des timings d'ejections.

Extraction des faisceaux vers SPS à nouveau OK apres avoir bougé les cables de distribution du TFID. (à suivre...)

Ejection vers AD ne marche pas. Le kicker AD jette de 60us. (AD problem)

Dimanche

Modification du bump de la 2em injection impossible (INCA pbl => op issue)

AOB

Test fermeture du bump a l'injection avec Yasp. Beaucoup de difficultés. Procédure, instant réel de la mesure ?

Les programmes de mesures d'emittance doivent accéder LSA pour les optiques.

TOF : 100e10 sur dédié et 200e10 sur parasite.

SPS (Django Manglunki)

A good and varied week for the SPS, no major breakdown.

On Monday the Quad34 of M2 line was repaired by unclogging the water circuit. In the afternoon, the full 4 batches of 36 bunches was sent to HiRadMat. At 16:00 the Pb ion was already available from the Linac3, only 6 hours after refilling of the source.

On Tuesday the ion commissioning went on.

On Wednesday the UA9 floating machine development started at 9:30 after the LHC filling, and lasted until the next morning at 8:00, when the collimator MD took over. Both used the 120GeV/c coasting cycle instead of 270GeV/c which had been initially foreseen.

CNDS and North area physics was resumed at 20:00 on Thursday instead of 08:00 the next morning as some of the BBLR MD hardware was not ready. The 12 hours of BBLR MD will be recuperated at a later date.

On Friday ion commissioning resumed.

At 22:40 a power cut affected all of the Meyrin site; SPS did not suffer apart from the unavailability of beam from the injector complex. The beam was again completely available on Saturday afternoon after repair of the PSB distributor.

The ion beam was also routinely verified during the week-end to make sure of its availability for the MD on Wednesday 30th.

So far CNGS has accumulated $4.23E19$ protons on target, i.e. 6% above the expected amount for today.

LHC

Reasonable performance compromised by availability in particular SEUs impacting QPS.

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