

Accelerator complex status

End week 7 (Sunday 15th February 2015)

TI (Jesper Nielsen)

TI summary of the week:

<https://wikis/display/TIOP/2015/02/16/TI+summary+week+7+2015>

Linacs (Michel O'Neil)

Linac 2: No problems to report during the last week.

Linac 3: Also no problems to report.

Both machines are running very reliably. Following the failure of the Linac 2 arc power supply the week before last, the chassis has been repaired and is now under test with a test load for the coming week.

LEIR (Maria Elena Angoletta)

On Tuesday February 10th I setup the LEIR LLRF to work with the second Finemet cavity installed in the ring, namely CRF41 instead of the CRF43 that we've been using until now. This was a request from my HLRF colleagues, which wanted to better spread the "wear and tear" of operation between the two Finemet cavities by alternating them in consecutive LEIR runs.

On Wed and Thu I was at home sick so Django once more had to replace a sick supervisor (thanks Django!).

On Wed Feb 11th, TE/EPC eventually fixed the (very) long standing issue of acquisition and status errors on ER.QFN2344, EE.BHN1020, and EI.BHN10. This issue had been dragging on since the startup after LS1 and we're happy it is now over.

On Saturday and Sunday I was called to the CCC because North Area complained of fluctuating intensity. This was traced to fluctuating intensity injected into LEIR. By changing the values in the injection element ITE.BHN40 (I played with other elements but this was the better one) I managed to reduce the fluctuation in the cycles sent to the SPS_DUMP, at the expenses of the other cycles in the supercycle. I also changed the electron cooling settings and several LLRF settings (at capture as well as during the whole cycle) to further reduce the longitudinal emittance at the LEIR extraction, so that our PS friends can have an easier life (from an emittance viewpoint at least). I finally managed to get back to the 1.5 eVs at the LEIR extraction that I was given as specs and that we had during LEIR operation last fall, so all is well.

Still, even this evening I can observe a variation that can sometimes reach 20% between the less intense and the more intense beam out of LEIR in a batch of 4 cycles sent to SPS_DUMP. For the vast majority of cases this variation is smaller, say between 5% (or less) and 15 %.

Unfortunately, there is no magic wand apart from some “human feedback” so far to solve the variation of injected intensity into LEIR. With the collaboration of CO, we are putting in place a field compensation application to compensate in PPM the PS magnetic fields. Until that is available we have a 5th ANOMINAL->ION1 cycle (destination TT2-D3) in front of the 4 ones we use (destination SPS-DUMP) that allows us to minimise the changes, but not to eliminate them.

This is it for the moment, it's good news but we should have even better news sometimes soon.

Booster (Alan Findlay)

Another week of setting up for the PSB, but we're now getting into all the details and ironing out the problems we encounter.

Only two real problems of note, the R1 V wire scanner broke its wire on Thursday and will be replaced on Wednesday morning, and the R4 distributor BI4.DIS required a Thyatron change which took just over 3 hours to fix.

The focus of the week was setting up TOF & LHCINDIV, both of which are now delivered to the PS, although there is still work required to bring them up to nominal specification. We also delivered a first version of them LHC50 A&B to the PS, upon the request of the PS RF team, but this beam also needs further work to achieve nominal specification. The operations team have also started bringing the LHC25A&B back online and work has begun setting this up.

All in all, plenty to keep us busy but we're getting back on our rings.

PS (Gabriel Metral)

Déconsignation Lundi matin du septum d'injection des Protons. Un réglage des rendez-vous machine PS SPS a été fait lundi après-midi pour les ions. (Ce réglage avait été fait pour les protons fin du RUN 2014) Les Protons ont été rapidement injectés, accélérés et extraits sur la Dump D3.

En fin d'après-midi Lundi, un faisceau LHCINDIV a été délivré à la machine SPS pour faire son Test de sécurité validant la possible production de Proton et d'ion (zone Nord en mode primaire)

Les ions ont été délivrés pour la physique sans problème majeur. Seule la cavité 80-08 reste 'fragile'. Intervention du Piquet RF ce WE sur cet équipement et nombreux reset.

L'opération des faisceaux INDIV, PROBE et LHC50 a été mise en place cette semaine.

Une de nos priorités consiste à trouver une solution avec le groupe POWER pour solutionner le problème d'acquisition des équipements basse énergie (dipôles, quad et skew [150 équipements])

SPS (Benoit Salvant)

It was a good week for the SPS.

The interlock test designed to prevent sending high intensity proton beams to the North Area during primary ion beam physics successfully took place on Monday with the safety team. After that, Argon ions were sent to the North Area “targets” T2 and T4 from Tuesday onwards without major issues throughout the week.

Detailed report

On Sunday, the BETS continued to trip and a meeting took place between TE-ABT and TE-EPC experts on Monday to tackle the problem that turned out to be related to the DCCT drifting issues that significantly affected the SPS in the last week of the 2014 run. A temporary solution was put in place on Monday afternoon (additional grounding) and the BETS has not tripped since.

On Monday morning, the PS operation team informed that they wished to delay the extraction by 9 PS turns, which required retuning of the SPS MOPOS, kicker and RF settings at injection. This retuning was only performed for 2 of the 6 cycles that had been prepared.

On Monday afternoon, the interlock was successfully validated by the safety team. It could be checked at that occasion that loading a proton cycle in the sequence with destination to the North Area and a current on the SPS magnetic extraction elements required quite some effort with the new hurdles that were put in place to prevent this. It is also important to note that pulsing the MSE and MST with a current that is lower than the threshold set by the safety team will not trigger the interlock, but the current on these elements would still be brought down to 0 by the SIS. The interlock tripped on Thursday when one of the two BCTs used for the interlock crashed and was rebooted with the MST and MSE pulsing. A procedure was put in place to avoid tripping the chain in case such a crash occurs.

On Monday, the quadrupole QNLF2410M that had shown a magnet fault during the weekend was pulsed to high currents to recreate the fault but it did not trip at that time. It however tripped 10 times on Monday night and the piquet EPC changed a card on Tuesday morning, but it kept tripping anyway. The magnet piquet intervened and found that a water valve was closed. It was opened and there were no more trips.

On Tuesday an exchange of a terminating magnet resistance on the MKP generator 2 was organized since it was overheating. It turned out it was only a cable connection problem and the TMR was not exchanged.

On Thursday, the mains tripped (both SMD4 and SMD10), stopping all beams in the SPS. The piquet Firstline was called but did not answer. After many tries - and the help of TE-EPC - someone from FirstLine was finally reached 25 min later. On site, he saw a water flow problem on both converters that did not appear on the water cooling system surveillance. TI therefore called the piquet DALKIA who was not convinced he had to go on-site. The EN-CV piquet confirmed that the equipment was under DALKIA's responsibility. It is only 2h20 minutes after the first call to DALKIA that the piquet DALKIA was on-site. 20 min later, the problem was solved by increasing the water cooling flow. This altogether caused almost 4h of downtime for the North Area physics.

The rest of the week was very quiet, only disturbed by a couple of RF trips that required replacing 2 resistors and a 100W power supply (1h20 downtime in total).