

Accelerator complex status

End week 29 (Sunday 20th July 2014)

TI (Peter Sollander)

TI summary:

<https://wikis/display/TIOP/2014/07/15/TI+Summary+week+28,+2014?src=contextnav>

Linac2 (Rolf Wegner)

Continuing from last week, RF amplifier faults were seen for tank 1 (a few times per day).

The tube of the amplifier on Buncher 1 degraded and had to be exchanged.

In parallel to an access to the switchyard on Wednesday morning, this tube exchange on Buncher 1 was done as well as several parts of the amplifier of tank 1 were changed. Unfortunately, the fault rate of tank 1 increased thereafter. The RF team continued working with 3 experts Wednesday afternoon and also Thursday morning when the problem was finally solved (it was a faulty current sensor in the amplifier).

Since then no further faults of tank 1 were seen and Linac2 operated stably.

Booster (Alan Findlay)

Another busy week for the PSB and all who sail in her. The setting up (and MDs required for this) have continued a pace, as have the problems, but we're now in the best shape we've been in all year!

We had a few breakdowns that took a wee while to fix, notably on Wednesday the Distributer BI3.DIS was down for 2H 15 mins, then on Saturday night the MPS went down and it took the PiPO just over 3 hours to fix.

The MDs on orbit correction and resonance compensation continued throughout the week, but by Friday both had advanced significantly. The FGC3's were returned to their regular configuration and the data is being analysed ahead of the orbit corrections planned next week. The resonance compensation with the multipoles was done for all 4 rings and the values ready to be copied to all users.

The TOF & AD beams were worked on all week, with TOF being sent to the PS on Tuesday and the AD finally following it on Saturday. The AD has an issue on R4 where losses are seen at extraction with more than 350E10 (nominal 400E10) which is being investigated. The PS asked for 150-200E10 to get them started, which we could produce without problems..

A trigger problem for one ring of the Tomoscope required a lengthy investigation by Jean-Claude Bau and the timing support team, but they identified the problem and had a fix in place by late Friday

afternoon, for which we thank them. During these investigations both the BSM & Tomoscope were not available, making the setting up of the transfer of AD beam rather challenging.

The ISOLDE watchdog & transfer line are being checked and debugged ahead of the DSO tests planned for Monday. The ISOLDE beam is still low at 400-450E10 per ring, but it's expected that the orbit correction and resonance compensation work this week will improve the situation when applied to the user this coming week. Once this is done, the fine tuning of the RF & TFB is expected to produce further gains.

PS (Rende Steerenberg)

The first accelerator based physics at CERN after LS1 started this week successfully in the East Area North branch. (Bulletin article:

<http://cds.cern.ch/journal/CERNBulletin/2014/30/News%20Articles/1743880?ln=en>)

The remainder of the week was used to continue the setting up of the nTOF and AD beams, during which many smaller problems were observed that have or are being solved.

The majority of the beam stoppers are now included in the MTG external conditions, meaning that the LINAC2 beam production for particular destinations is stopped whenever the beam stoppers are not out. The remainder of the beam stoppers should be included today.

This week is another decisive week, as beam needs to be sent on the nTOF target and the final preparations of the AD beam need to be made for beam on AD target next week.

LEIR (Michael Bodendorfer)

At the beginning of last week, un-noticed, double scaled magnet values in the ITH line (at the end of Linac3) led us to propagate this error into the optimization process of the remaining transfer line (ITE, ETL and EI), including the injection septa. LEIR refused to circulate the injected beam.

On 16.7.2014, we discovered the double scaled values in ITH. We then have started from scratch and rescaled the transfer line and the LEIR ring with the theoretical values, provided by Richard Scrivens. Immediately, the beam was transferred to LEIR, but LEIR did not circulate it. Small corrections (-1.5% for ITE bendings) led to an improved beam centering of the argon beam until LEIR. This supports our working hypothesis that the two bending magnets ITE.BHN20 and ITE.BHN30 are in saturation and, hence, scaling is non-linear.

On 17.7.2014, for the first time, we managed to circulate beam in LEIR. The final step was taken by scaling down the LEIR ring by another -0.5% in beam rigidity (from the value Richard provided). Since then, we can circulate beam in LEIR, when no errors or other interruptions occur - which, unfortunately, is not yet often the case.

A number of issues have occurred since then. Timing and acquisition signals are not always received by the power supplies, nor by the working sets for status reports. Power supply control processors now crash on a daily basis. Daniel Calcoen is helping us to identify this mysterious problem. We need more errors to identify the exact cause.

Since our success of circulating Ar11+ beam in LEIR, we have rescaled the transfer line from Linac3 to LEIR with the newly found beam rigidity. As of today, Sunday, July 20th, Ar11+ beam is circulating at the low energy plateau in LEIR with less corrections than on 17.7.2014 from the rescaled values.

We are now concentrating on accumulating more Ar11+ beam in LEIR. Subsequently, we will prepare for RF-capture and acceleration.