

## Accelerator complex status

### End week 10 (Sunday 13<sup>th</sup> March 2016)

#### TI (Jesper Nielsen)

Weekly summary: <https://wikis.cern.ch/display/TIOP/2016/03/07/TI+summary+week+10%2C+2016>

#### Linac 2 (Richard Scrivens)

Linac2 did not have a very good week.

Already from the previous week the source intensity declined to about 95%, which was initially put down to a reduction in training once the beam was delivered to the PSB.

The situation became much worse on Thursday when after a source flashover the intensity out of the linac dropped to about 65%, many tests checks of equipment were made, while the performance improved to about 90%, but without any sign of more to be found, nor any clear reason (no source sub system was found to be faulty). In addition, in this condition the transmission through the RFQ was also much worse than the previous week, such that the beam intensity from the Linac was not sufficient, and there was no sign of further improvement.

So the decision was taken on Friday to anyway replace several parts of the source, with the beam being available again after lunch on Saturday.

When the beam was returned, the source was delivering about 90% of the best intensity of 2016, but then again has been in slow decline since. A few additional tests were made on Sunday, and the team will meet on Monday morning to work out the next steps.

Now we have to think of scenarios that can lead to this situation, and work out tests to prove or refute them, sorry to say we do not have a quick fix.

#### Booster (Elena Benedetto)

We started the week full steam (before the problem of the source) with the preparation of beams for the PS and SPS, looking at longitudinal setting-up, orbit and extraction steering:

- low-intensity MTE, started already last week
- low-intensity TOF, started last week
- LHCINDIV, started last week
- high-intensity TOF
- LHC-Probe

They still need optimization, but all of them are already happily taken by the downstream machines.

Some issues (commissioning phase...), already addressed and solved or not impacting operation: disabled timings, wrong timing delays, discrepancies HW ACQ Vs. CCV, problems in the instrumentation, etc..

One major issue still needs follow-up (identified yesterday, Sunday morning): from shot to shot the beam for the PS is not ejected. It is a synchro problem as the timing BEX.W10SYNCPS is not generated. RF and CO timing specialists are already on it.

### **PS (Rende Steerenberg)**

A good start for the PS with beam injected earlier than planned. Remaining RF cavities issues have been solved. Low intensity MTE and LHCINDIV available to the SPS also earlier than planned. So far so good.

Following the completion of the hardware tests, dry runs and cold checkout on Monday the PS and TT2 beam permits were signed.

Issues with a 13/20 MHz and the 80 MHz cavity in SS08 meant that the RF group needed access for repair. In view of this we agreed to provide access during day time as long as necessary and beam commissioning with low intensity beam during night with a timely stop of beam in the morning to allow access from 08:00 onwards. RF used Tuesday, Wednesday and Thursday morning for the repair of the cavities, which are now operational.

The beam was injected Monday evening, slightly earlier than planned (Tuesday morning).

On Thursday the low intensity MTE beam was available to the SPS for their beam based realignment measurement. Friday the LHCINDIV beam was also available.

Over the weekend the delivery was interrupted by the LINAC2 source intervention, but beam production could be resumed on Saturday.

A very good start for 2016 protons, but still substantial work ahead to get all beams operational again. No show stoppers in view.

### **SPS (Django Manglunki)**

The SPS tried to take beam on Friday 11/3 but there was a timing fault on the injection kicker, due to a new "economy mode" introduced during the YETS, provoking the MKP to pulse on the dump load instead of the magnet. This was solved during Friday, allowing a very coarse injection.

Then the Linac had to stop for 24h (electrode problem at the source).

The first beam circulated on Saturday 12/3 evening, but there is an aperture problem: a 25mm bump towards the inside is needed around 410.

The transition was passed Sunday 13/3 morning and the beam is now accelerated up to the flat top.

During a linac stop, an access was done with RP on Sunday afternoon to try and identify the aperture restriction. A hot spot was found in 40901, but more on the inside (up to 4 mSv/h) than on the outside (max 0.8 mSv/h).

Another access is programmed for Monday 14/3 morning. The beam will be stopped at the latest at 23:00 on Sunday evening, and before the access, between 7:00 and 8:00, the SPS will take beam again with the bump removed in 410.

To be followed up apart from the aperture restriction:

- YASP calculates a kick twice too strong
- The mains tripped 3 times because of FGC
- Many trips of TRX3 & TRX4 over the week-end. During his intervention, the RF piquet saw commands arriving without operator action.