

Accelerator complex status

End week 16 (Sunday 24th April 2016)

- ISOLDE: beam to users
- AD: beam to users this week on schedule

TI (Jesper Nielsen)

Here's the TI summary of an (major) eventful week:

<https://wikis.cern.ch/display/TIOP/2016/04/19/TI+summary+week+16%2C+2016>

Booster (Elena Benedetto)

A good week and a lot of work done on beam fine tuning:

- Improved injection efficiency for Ring1 (ISOLDE beams), thanks to the careful optimization of injection settings and multipole correctors. Now Ring1 is as good as the others.
- Performed energy matching at injection for LHC25, first step of optimization in our quest toward the maximum achievable brightness.
- Work on the MTE beam, to recover the performances of last year and in particular the robustness versus change of intensity.

One important downtime of >4h, starting at 5am on Sunday. The injection septa of Rings 1,2,4 went down (beam was still available on Ring3). The piquet ABT came on site to troubleshoot and requested an access to check the flow-meter of the cooling circuit. The intervention took few minutes, but 1 hour cool-down was needed since the area is pretty hot. Finally an electrovalve was replaced.

PS (Rende Steerenberg)

With an average accumulated beam availability of 83% had the PS a reasonable week.

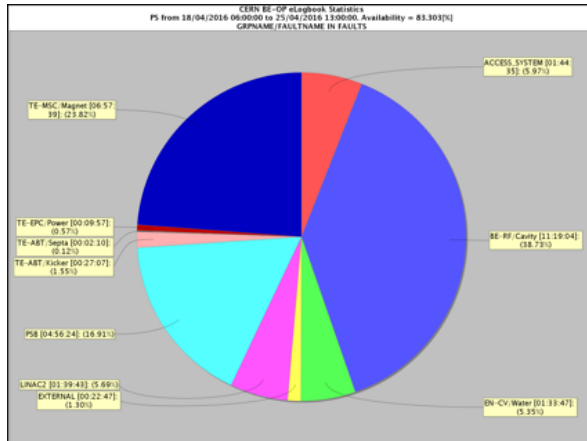
The main fault was caused by a sum of many smaller issues related to different RF cavities, resulting in 11 hours down time.

The second largest source of down time was caused by an issue on the main magnet interlock system that triggered a fake over temperature fault, which resulted in a stop of POPS, causing in total 7 hours of beam stop.

Issues in the PS Booster caused it to be the third largest source of down time with nearly 5 hours without beam.

The PS delivered the LHCPROB, LHCINDIV and the LHC25 ns beam to the SPS for the LHC and scrubbing in the SPS. The MTE beam was delivered in different flavours, but as of Friday the standard operational MTE physics beam was delivered to the SPS, although still at low intensity, as not all users required beam. The AD beam was delivered to the AD for setting up and the nTOF beam was delivered for physics. The East Area beams for the north branch and the IRRAD-CHARM facility are ready for the start of physics today (Monday).

Further work was done on the LHC 25 ns 80 bunch beam with success and some work is required to solve an issue on 2 modules of the extraction kicker after which the beam might be close to operationally available with correct transverse beam characteristics.



SPS (Hannes Bartosik)

After the HV conditioning of the newly installed ZS, the setting up of the Fixed Target cycle could be resumed on Monday morning. The setup of the slow extraction and position scans of the ZS anodes revealed an internal alignment problem of the new ZS. During an access on Tuesday, the ZS tank 2 had to be horizontally displaced by almost 2 mm towards the inside of the machine in order to accommodate the optimal position of the anode for minimal losses within the range of the stepping motor. In the meantime EPC and EL experts worked on the power converter for the bending magnet MBB.2505 in the transfer line towards T6, which could not be restarted since the weekend. They could trace back the problem to broken cable connectors on the 18 kV side of the transformer. EL had to pull new 18 kV cables and new cable heads had to be installed, which took until Friday afternoon. The power converter for the MBB.2404 bending magnet towards T4 has the same type of transformer and was therefore checked in a preventive measure. No problem was found on this transformer and it was put back online on Wednesday.

The beam was successfully extracted towards the T2 and T4 targets in the night of Wednesday. Setting up of the experimental beam lines started on Friday morning, after the BI expert changed the calibration of the BSI target intensity monitor from ions to protons. The beam was delivered to the experiments on Friday afternoon. On Saturday evening the NA beam had to be stopped for about 6 hours for an access in TCC2 in order to solve a magnet cooling problem. A few hours downtime were accumulated on Sunday as the beam was not available from the pre-injectors.

The machine availability for the LHC beam was generally good, with the exception of a few hours on Wednesday morning when a problem on the chilled water in BA3 tripped the main RF system. Otherwise the work on the LHC beams concentrated on the setting up of the 25 ns beam. The new automatic Laslett tune shift correction was successfully deployed. Based on the number of injections requested, the tune shift is corrected for each injection directly on the FGCs for the main quadrupole circuits.

First extractions of trains with 12 bunches could be performed on Wednesday and single batches of 72 bunches with 1.2×10^{11} p/b within 2.6 μm were sent to the LHC on Thursday for setting up in the LHC. During the weekend the SPS accelerated up to 4 batches to flat top for the conditioning of the MKE4 kicker and the new ZS. Three batches are ready for extraction to the LHC, however 4 batches still require further conditioning of the MKE as the vacuum interlock level is still reached from time to time.

A water leak on a power converter in TI2 needs an intervention of about 8 hours next week.

LHC

First Stable Beams with 3 bunches/beam on Friday 22nd April. Continued interleaved commissioning and Stable Beams over the weekend with two good fills with 12 bunches/beam. 25 ns scrubbing this week with up to 288 bunches per injection.