

Accelerator Complex Status

End week 16 (Monday 24 April 2017)

TI (Jesper Nielsen)

Saturday morning 06:13, an ODH sensor went in alarm in UJ64, it was decided to inhibit the sensor until a possible access in the zone.

Monday morning 06:21, an Electrical perturbation tripped the booster. EDF-RTE confirmed the perturbation on a 225kV line from Génissiat.

The detailed report can be found at (CERN internal only):

<https://wikis.cern.ch/display/TIOP/2017/04/24/TI+Summary+Week.+16>

LINAC2 (Mike O'Neil, Rolf Wegner):

99.7% availability.

One blocking fault, Tank 1 Quads and RF required reset (not clear which was the root cause).

Some variations in beam intensity on longer cycles observed originating with the RFQ. A temporary fix is in place. An intervention to adjust the RFQ amplifier electronics will be required. To be arranged.

LINAC3 (Mike O'Neil, Rolf Wegner):

Start-up is ongoing. 30uA Xenon out of the Linac.

PSB (Alan Findlay):

A week of setting up in the PSB with AD, low intensity MTE, medium intensity TOF and nominal intensity HRS & GPS prepared and sent to the PS or ISOLDE, along with the previously available LHCINDIV and LHCPROBE.

The EAST users and BCMS25 are in the process of being setup.

A number of problems were identified and solved during the week, allowing the high intensity ISOLDE beams to be used for the beam steering.

The orbit correction program for all rings was completed, aiding enormously achieving the high intensity beams so quickly.

We requested a beam stop on Wednesday morning from 10-12H30, firstly to check some suspected faulty RF equipment on R4 C04, but when Matthias entered the machine, he saw a water leak that we took the opportunity to get fixed. Unfortunately, the exchanged RF equipment did not solve the problem, but helped to push the resulting beam loss with high intensity beam to later in the cycle. The investigation into the cause is ongoing, but a fix is in place to achieve the nominal intensity for the ISOLDE users.

Monday early in the morning the PSB was largely cut due to the power glitch.

All in all, a busy week for the PSB crew, but great progress made.

ISOLDE (Eleftherios Fadakis):

This week was all about semgrid tests.

On Wednesday we performed the semgrid tests on HRS(thanks to Delphine).

Thursday late morning ready for double target change.

Needed to take the semgrid target from HRS and place it on GPS, then put target #596 on HRS.

Semgrid on GPS went in nicely but on HRS there was an issue with the robots.

The target could not go in place and after some delicate manoeuvres they managed to

place an old target as a plug.

Tests on GPS with the semgrid were performed on Friday morning (thanks to Emiliano on the PSB).

Friday noon the correct target went in place. De-consignation of HRS (transformer and target HT) was done.

Heating of the target finished at 16:00. Delivered stable beam(40Ar) at 20:00.

Today Monday we will work on the transmission pass the cooler and later today do the proton scan on HRS.

PS (Matthew Fraser):

It has been a steady start for the PS with a low intensity MTE beam delivered to the SPS on Friday afternoon and over the weekend at approximately 350E10 ppp. LHCINDIV is also ready for the SPS and setting-up of the AD beam has continued with an intensity of approximately 1000E10 ppp sent to D3. The AD Target beam permit was signed on Friday. The closed-orbit of the machine was successfully corrected by displacing Main Units (MUs) 18 and 33 on Wednesday morning, reducing the rms orbit excursion from 2.1 to 1.3 mm. The start-up has been complicated by on-going issues with the calibration and regulation of the FGC's in the power converters for the PFW and Figure-of-8 (W8L) circuits of the MUs. Aside from regular trips needing resetting or piquet interventions, confusion was caused as the machine was restarted after Wednesday's realignment campaign when incorrect settings were synchronised to the FGC on PR.WDW. As a result, the tune of the machine could not be controlled and splitting of the MTE beam became impossible. Beam-based investigations on Thursday pointed to an incorrect current being sent to the PFW, which was confirmed and corrected by TE-EPC experts on Friday morning. The calibration error amounted to a factor of 3/5, but was not evident on the measured current provided by the FGC and available in the CCC; the PFW's appeared nominal despite this important calibration error and no DCCT's are presently available for these circuits. An intervention by a TE-EPC specialist is planned on Monday morning at 8:30 am to improve the stability and regulation of the PFW and W8L circuits and, as a consequence, beams to SPS and AD will be restricted until midday. Setting-up will continue on MTE and multi-bunch LHC beams as well as AD, EAST and TOF beams.

SPS (Karel Cornelis):

After the Easter weekend, SPS cold check out continued, interleaved with DSO tests and the purging of the polluted beam dump cooling circuit. Although it is not completely clean yet, the experts are confident that the filters of the cooling will hold, at least, until a next technical stop. A lot of time was spent on the debugging of the new digital current loop of the SPS mains and by Friday the machine was considered to be in a good enough state to make a start with the beam commissioning. First beam was injected on Friday afternoon and establishing circulating beam went really smooth. However, after some orbit studies we convinced ourselves that both tunes were off by several units. It turned out that the calibration of both reference and current measurement were wrong by 20% on QF and QD giving a consistent correct current, but which was 20% too low in reality. After fixing this the setting up continued over the weekend, the main objective being the commissioning of the closed orbit monitors as preparation for the beam based alignment. On Saturday evening the beam was stopped because of a problem with the BLM's. It turned out to be a bad contact from the newly installed cables from BA5, 6 and 1. An access was

needed and the connection were temporarily fixed. We have been dumping 3×10^{12} protons for long periods on the new TIDV. The temperature of the graphite core went up to just over 60 degrees and no activity on the vacuum was observed.

LHC (from the 8:30 meeting):

The LHC hardware recommissioning and testing is in a well-advanced state.

The ELQA is completed and the power converters are unlocked.

The late preparation of the sector 1-2, which was warmed up over the EYETS for the replacement of a dipole magnet was due to a short to ground during ELQA tests the RB circuit. This delayed the powering tests by 1 week, but by now it is also recommissioned and only required 2 training quenches to reach the 6.5 TeV (+100A) level. The 1st quench was a 10935A and the 2nd at 11055A. for both magnets this was the first quench in the tunnel.

Last week a problem was fixed on the energy extraction switches of sector 1-2 where a broken connection in a connector was repaired.

There is an issue with a temperature undershoot on the current leads temperature regulation that is being investigated. Also on the 60A circuits, some have a slightly higher resistance, which will be discussed within MP3.

Today there are a few interventions among which the repair of a temperature sensor. This week the machine the powering test will be completed and the machine check out will start. Beam still foreseen for May 1st.