

Accelerator Complex Status

End week 14 (Monday 11 April 2016)

TI (Jesper Nielsen)

Monday at 10:00: EN-EL needs to do an intervention in the substation 16 in Meyrin, powering CTF3 and buildings around. The breaker had tripped and is now getting warm, which means that it is degrading rapidly and the intervention took place on Monday.

Tuesday 11:55 there was a Trip of the EMD804/4R that supplies the RF at point 4. Reset and switched ON at 12:46 solved the issue.

Friday at 07:25 there was a Trip of the breaker EOD331/45X (400V) which supplies the rack AYAPW for RF in UX45

The LHC has been stopped to fix the problem at 10:30

Sunday at 06:34 there was an electrical perturbation on the 400kV network. All the machines have been stopped, but cryo was unaffected. There was a fault on a line between Genissiat and Cornier

Overview: <https://wikis.cern.ch/display/TIOP/2016/04/04/TI+summary+week+14%2C+2016>

LINAC2 (Richard Scrivens):

Linac2 had a fault free week. The source parameters are almost back to normal, with just 10% higher arc current than the beginning of the year.

LINAC3 (Richard Scrivens):

Linac3: The source made tests with a second microwave frequency heating. Data needs analysis. The beam was sent to the end of the Linac.

100ms pulse rate testing also continued and everything looks to be working as expected.

PSB (Gian Piero Di Giovanni):

it was a good week for the PSB with very little downtime, of the order of minutes.

The week was mainly dedicated to setting up the ISOLDE beam by optimizing the steering in the BTY line and taking the needed references on the target SEM GRIDs. ISOLDE data taking for physics should hopefully start this afternoon.

On Thursday, thanks to the excellent preparation work done by the PSB operators, the PSB could support the setting up of the control parameters of the new modulator circuit in the HT room in ISOLDE without any issue occurring.

Other than that, the PSB team worked on refining the setting up of the different beams as well as actively pursuing the open operational issues (timing, beam instrumentation, etc, etc).

ISOLDE (Erwin Siesling):

A busy week at ISOLDE with successes and some disappointments too.

SEMGRID tests:

As part of the yearly setting up of the BTY line to HRS and GPS the semgrid tests were carried out last week and finished even a bit ahead of time on Wednesday afternoon. All settings saved and compared to previous years. We are running with a properly set up proton beam for targets and convertors. Many thanks to PSB OP for their hard work.

HRS HT tests:

Jan Schipper and Thierry Gharsa successfully carried out HT tests of their new High Voltage modulator. It was essential that these tests were carried out in the ISOLDE HT room to allow the specialist to set and adjust all their control parameters with regard to the real environment. To have people in the ISOLDE HT room, which is part of the ISOLDE safety chain, special safety measures were taken. The radiation alarm was lowered to 50uS/h and tested for the zone and continuous surveillance in the CCC carried out during protons on the HRS target. The max proton current was set and tested at 0.3uA with the PSB SIS system. Several other measures were taken to allow the people to be in the zone while taking protons within safety margins. Set protons intensities varied between $1.5\text{-}3.3\text{E}13$ ppp and 2-3 pulses per supercycle (53 cycles). The tests were very successful. Furthermore it was demonstrated that the new modulator circuit is capable of re-establishing the HV with improved recovery time. This way more data can be collected for many short-lived isotopes.

HRS run with protons will start this week.

GPS Be target:

Collections for nTOF of 7Be were foreseen last week and during the weekend, however, the target is not performing as it should and the production of Be is far too low (factor 100) for any useful collections. By using the telescope from RILIS it was observed that the target line is not at its nominal temperature (some 1900 C) but far below judging the color of the glowing line (orange instead of bright white) even though the current sent through the line is correct. There is also some misalignment of the line within the target configuration which causes some issues for the laser ionization to be efficient but this could be overcome. Regarding the heating we are now excluding all possible causes. A visual inspection of the cables on the front-end has been carried out but no issue has been found there. Today we will investigate further disconnecting the current cables and measuring resistance, etc. Unfortunately, there have been no collections possible over the weekend.

AOB:

We are now running from the new control room. Some of us have to get used to the bright daylight and quiet environment. It is a major improvement to the comfort of operating the facility.

PS (Ana Guerrero):

This week beam permits for TOF, AD and EAST area were signed on Tuesday, Wednesday and Friday respectively. Beams were sent as requested on the same day

to TOF and AD. On Friday the EAST beam setting-up was finalized, then steered to the zones during the week-end. Other beams delivered: LHCINDIV, LHCPROBE, LHC25ns, MTE, MTE without core, MTE only core.

On Thursday, there was a programmed stop for EAST DSO tests. In synergy, access for repairing an 80MHz cavity (C80-89) was given, which affected mainly the work on HiRadMat and AD. The total down time was 1h. During the week-end another 80MHz cavity, C80-88, went in fault. The spare C80-89 took long time to start. The LHC beams were not available during 1h.

AD (Tommy Eriksson):

The AD ring is still in HW-test mode where progress is made on various systems. This takes place in parallel with vacuum bake-out of 2 ring sectors, 2A where the BCCC has been installed after successful repairs/tests and 2B due to a leak repair in one of the C10 cavities.

For the target area, beam has been sent all the way to the end of the dog-leg and basic checks of target/horn functionality have been carried out.

The ring should be ready for beam on the 15/4 which leaves us very little time for setting-up.

Initial checks of C10, beam cooling systems and deceleration losses will show if we can make it in time.

SPS (Verena Kain):

The highlight of this week was the first extraction of 288 bunches of 25 ns for the first HiRadMat experiment. The bunch intensity was $> 1.2e+11$ and the emittances (measured with 3 batches at 440 GeV) at best 2.7 μm in V and 3 μm in H. The 800 MHz RF cavities and control as well as the transverse damper were fully operational. HiRadMat also allowed to detect issues that could have impacted the LHC. Cavity 4 kept tripping with 4 batches. It is possibly related to the peak current with the fully operational 800 MHz. An amplifier was exchanged, but the problem is not fully under control. The other problem was related to the interlocked BPMs in the extraction region. The measurement and hence interlock window was not triggered at the correct time. This is fixed now. The HiRadMat experiment could not be finished on Friday as all their cameras as well as the vibrometer DAQ are down. Probably due to radiation. The team will ask for an access next Wednesday to repair and exchange as much as possible. Another 4 to 5 288 bunch shots will be required after a beam based alignment with single and 12 bunch shots.

The BETS problem that already started end of last week was traced back to a faulty cable from a DCCT measuring the mains current to the BETS system. The cable was exchanged.

Unfortunately, the setting up of the North Area could not start this week as foreseen, as a major aperture restriction in the vertical plane was identified in LSS2. All measurements indicate that the restriction is located between ZS1 and ZS2. Since Friday evening also all other high intensity beams have been stopped and the BLM threshold at ZS2 has been lowered. During the technical stop on Wednesday the pumping module between ZS1 and ZS2 will be removed to inspect both tanks.

Vacuum conditions will only be back about 24 h afterwards. ZS conditioning will take another 3- 4 days. High intensity beams and extraction to the North Area will only be possible again from the 18th of April.

Work also continued on the LHC25NS cycle. The damper is operational and one 800 MHz cavity. The work on the 800 MHz will have to continue next week. Tunes are set up for 72 bunches.

Otherwise the usual few smaller issues were encountered (broken relay on cabled loop of access chain 3, BA 1 cooling issue,...). The TI 2 WIC problem did not re-occur. All beam instrumentation in the extraction channel of LSS2 is operational now.

LHC (From the 8:30 meeting):

Quite a good week for the LHC setting up with RF phasing and ADT setting up together with injection and beam dump. An issue with injecting in the first buckets was solved on the LBDS side, but not fully understood

The squeeze with bumps was setup and the RF blow up during the ramps was tested. Also loss map measurements were made.

The TDI impedance was verified and the gaps were reduced first to 1.8 mm more than nominal and later even 4 mm more than nominal, resulting only in a tune shift of $1E-4$, which is a very good preliminary result.

Excellent availability over the weekend

Collisions at 40 cm and new bumps set up was done in 4 fills, first Friday in IP2 and IP8 and later on Saturday also in IP1 and IP5.

Sunday tests with 3.5 TeV and 6.5 TeV pre-cycles which look promising as tune and chromaticity are very similar for both cases. There were also 2 fills for collimator alignment and aperture measurements at 40 cm which confirm that there is nearly no aperture margin left now.

Possibly trains as of Tuesday.

For more details: <https://indico.cern.ch/event/506404/>