

Accelerator Complex Status

End week 20 (Monday 22 May 2017)

TI (Jesper Nielsen)

Monday 19:58: Partial power cut of AD. A transformer (EMT103*49) had tripped on high temperature. The problem was not with a temperature sensor, but a bad connection of the sensors. This problem is known and a campaign for changing all of these has been planned.

Tuesday 18:30: Chilled water production in SU2 stopped, while being worked on for a problem of temperatures in the SR2 building. BLM/BPM racks door opened, but still interlocked and dumped the LHC. Normally the doors should open, but not interlock the beam.

Wednesday 17:41: In the morning various problems with racks not communicating in LHC4. it was thought to be either a IT problem or local power cut. An access was planned for 17h to investigate, and this is when a water leak was detected in US45. 18kV was cut voluntarily because water was pouring on the transformer.

Thursday 20:07: Humidity in the NA62 cavern was very high, and an access was necessary to fix the problem.

More details : <https://wikis.cern.ch/display/TIOP/2017/05/22/TI+Summary+Week%2C+20>

LINAC2 (Francesco Di Lorenzo):

Linac2 had a good week. On Monday during lunch we had the same problem last week with the start / stop times of LT.BCT20 triggered the watch dog to cut the beam. The problem has been solved in half hour and we had the same problem around 19 o'clock, but the problem was solved in a few minutes.

Overall we had good availability.

On Wednesday afternoon we have seen a water leak in the building 150 and the has dropped water on an energy distribution, so we informed the CCC just to be ready to turn off all the machines. But this problem didn't compromise the normal operation of Linac2 and 3, and the water leak has been solved by the Fire Brigade.

LINAC3 (Francesco Di Lorenzo):

On Monday morning the beam was only present in the source without passing the T15, the problem was a power supply broken in RF equipment. The problem has been solved by the RF specialist in half hour.

On Wednesday at 6pm, LINAC 3 stopped pushing the beam, because the RF generator inside the cage has tripped, but the problem has been solved only with the reset. Friday we had a problem with the beam stopper due to an INCA update, however the problem has been solved and the LEIR started to take the beam

Also for LINAC 3 we had good availability.

LEIR 0:

Will come soon

PSB (Jean-Francois Comblin):

The Booster suffered very few downtimes, around 2 hours, with no major problems.

The wirescanner of ring 4 horizontal plane is broken and need to be replaced.

The high intensity version of the MTE beam is now available, even if some optimisations regarding losses are still needed.

STAGISO beam has been taken by Isolde both to HRS and GPS, after a re-steering of the Isolde transfer lines.

HiRadMat beam has been set-up and sent successfully to PS and SPS.

And finally BCMS25ns has been prepared and is available for the LHC recommissioning end of this month.

ISOLDE (Miguel Lozano):

It has been, until now, a great week at Isolde.

GPS started delivering Mg beams to GHM on Thursday night and has been running smoothly since then. This morning we will stop and replace the target.

Some re-steering of the BTY transfer line was needed for both GPS and HRS.

On HRS we had some RFQ investigations and ISOLTRAP stable beam tuning.

No major faults to report.

PS (Ana Guerrero):

A good week for the PS machine with a full availability of 87%.

PS delivered EAST beams (IRRAD normal and blow-up version),

EAST NORTH (now on Target1), the dedicated and parasitic beams for TOF ($\sim 720E10ppp$ / $\sim 300E10ppp$) and the AD beam ($1.4E13ppp$)

LHCPROBE and LHCINDIV beams were also available for LHC.

On Wednesday morning, TE-EPC and EN-CV adjusted the water supply pressure and flow of the 365 building's cooling system, putting an end to a series of tripping of these power supplies.

From this day also, sublimation that occurs every day at 17H30 no longer tripped the P1.SMH42.

The intensity of the MTE beam was increased to $1.2E13$ per cycle on Thursday morning and a BCMS 12 bunches version was prepared and sent to the SPS.

During the weekend, emittances of LHCVINDIV beam were found to be too small. An adjustment of the PSBooster Working point solved the problem.

The main downtimes were related to the power supplies installed in Building 365, the quadrupole magnet ZT9.QF004, ZT10.QF003 (only affecting EAST beams) and FTN.QDE430 (only affecting NTOF).

The PS also suffered from several problems of high level on the cavities 10MHz.

The intervention of the specialists was necessary during the week-end.

Finally, on Sunday a low intensity beam type LHCPROBE ($\sim 5E9ppp$) was accelerated to 24Gev and extracted in zone EAST with a spill of about 300ms.

AD (Bruno Dupuy):

It was another good week for the AD (except one power failure...).

So only one issues to report:

Saturday morning around 2 AM one of the main AD transformer tripped due to a failing temperature sensor. The same default that produced last week black-out.

The TE-EPC piquet was called by CCC immediately to restart the transformer.

When the power came back, the cooling station automatically restarted creating a quick variation of pressure that triggers one of the overpressure safety valve into ELENA.

The valve, due to a malfunction, stays open and a large amount of water was released in the ELENA area. The fire brigade had to pump few centimeters of water in the ELENA / GBAR area.

Bruno was called in the middle of the night and has arrived as soon as the power came back to supervise all the pumping operations. Bertrand also joined him early in the morning to help him restarting the AD and to check with the fire brigade the status of ELENA where many cables were still submerged in demi-water.

Thanks to the help of First-Line (2 people), M. Haase, A.Frassier, Carlos Oliveira (on remote connexion from Spain), D.Landre, V. Gomes-Namora, C.Lolliot, N.Roger, PiVac, CCC Crew and the Fire Brigade.

The beam was back for physic at 13:20.

Here is the list of system / equipment affected by power-cut:

System / Equipement	Problems & Actions
Vacuum	Vacuum pumps and valves was restoring by PiVac service.
Electrical Power	Restarted by the TE-EPC piquet.
DR.BHZ DR.QUAD DI.DHZ6081 DR.EC-GBH_EC1 DI.BHZ6081 ADE.AC02.TUBE & TUNE	Many Power-supplies was started by First-Line. <ul style="list-style-type: none">Note that First-Line was called several times.
ELECTRON COOLER	Restarting from scratch with warm up of the filament. By convenience the filament power-supply was switch to REMOTE mode. - Specialist checking must be done Monday.
STOCHASTIC COOLER	A 5V locale power supply has remained in the disable output mode. Restart by D.Landre. Subsequently, he

	has been of great help to us on RF PLCs problems.
PLC: CFP-193-AC10-1 CFP-193-AC10-2 CFP-193-AC02	Due to malfunction of SILEX layer, the FESA interfaces all the RF PLCs are inaccessible by control applications (Knob, WorkingSet, Inspector). <ul style="list-style-type: none"> • Operation locally stay possible and through remote PLC display. • Will be fixed Monday by C.Oliveira.
Cavity C02 + FGC_3.1 ADE.AC02.TUBE & TUNE	After an electrical cut, the parameters of the FGC3 must be rewritten. These power supplies are controlled through PLCs. They are not visible by the standard tools. Correction to be expected by C.Machado and / or RF team.

Before that and after that the week passed without incident.

SPS (Karel Cornelis):

Besides providing FT beams, pilot and INDIV beams to LHC and HiradMat, the SPS continued its dense start up program. The 25nsec LHC filling cycle was commissioned with 12 bunches nominal and BCMS. The 12 bunches were taken by the LHC on Saturday. Four nominal batches accelerated on the HiRadMat2 cycle and used for scrubbing and beam dump commissioning. The beam dump temperature can now rise to 250 degrees (Graphite core) before it starts outgassing. This temperature is only reached after an hour of dumping. We also commissioned the AWAKE cycle since it is programmed to be used the next weekend. The Fixed target intensity was doubled last Thursday and we are running now with 15e11, 30e11, 100e11 on T2, T4 and T6. There was a problem with the cooling on the north extraction septa which would overheat in the high duty cycle (1 cycle/18sec). This was fixed last Thursday and since then we have been using this duty cycle whenever possible.

LHC (Enrico Bravin & Wolfgang Höfle):

- Monday
 - Given access for cryo (IP4+IP6), in the shadow 12 hours CMS data taking without beam
 - Commissioned and validate the AFP movement interlock
 - Measured the beta functions in IR4 using k-modulation.
 - Performed a cycle with pilots for FMCM validation (RD1.LR5)
- Tuesday
 - Calibrated the collimator BPMs plus BI tests (quadrupolar scan)
 - Validated the collimator settings and functions along the cycle, ended with an FMCM (RD1.LR1)
 - Validated the Direct dump BLM
 - Measured the aperture in the transfer lines and injection region
- Wednesday
 - Loss maps at injection (H/V B1/B2 injection protection IN)
 - Measured the aperture in collisions and validated the TCDQ settings in one cycle

- BI team discovered a water leak in US45 (over BI racks and 18kV transformer), lost cryo for 24 hours
- Thursday
 - Finalised the loss maps at injection
 - Cycle with pilots for FMCM (RD34)
- Friday
 - Validated the LBDS with the last dump at intermediate energy (1TeV)
 - Measured and corrected the IP6->1/5 phase advance, ended the cycle with the last FMCM (RD34)
 - Validated the interlock BPMs
 - Aligned all but one Roman pots at 150urad, beams dumped by LVDT problem
- Saturday
 - Access for EPC and MPE
 - Validated the injection of 12b trains
 - Validated the Abort gap cleaning + Injection gap cleaning
- Sunday
 - Validation of ADT used as AC-dipole
 - Roman pots alignment 150 urad and 120 urad
 - Loss maps at Flat top