End Week 43 (October 28th 2012) – Status of Accelerators

Statistics

nTOF: https://espace.cern.ch/be-dep/OP/PS/default.aspx

CNGS: https://accstat.web.cern.ch/accstat/statistics/charts/2012/SPS/CNGS_Target_Cumul2012.jpeg

LHC: http://lhc-statistics.web.cern.ch/LHC-Statistics/index.php

LINAC2 (Giulia Bellodi)

Operation at Linac2 went smoothly throughout the whole week. There are no problems to be reported.

LEIR (Maria Elena Angoletta)

LEIR was supposed to restart with beam on Monday October 29th , according to the latest machines schedule. Thanks to an ahead-of-time restart of Linac3, LEIR had beam knocking on its door already on Tuesday October 23 and managed to accumulate, capture and accelerate beam before the end of the week. Intensities on EARLY and NOMINAL beams were about half of the nominal intensities, so work will have to be invested in their optimisation. On Thursday evening the source was stopped to be refilled; beam is expected to the back to LEIR on Monday October 29th.

Several problems were experienced during the LEIR startup: some were just old problems, supposedly solved, some were new and quite original.

First, during the one month LEIR shutdown (September – October 2012) vacuum access privileges of leiop and cpsop were revoked without anyone of the LEIR crew being notified. It should be mentioned that most people from the vacuum group itself were not aware of this change and this added to the general confusion. It appears that the decision was based upon some incorrect knowledge: for instance, people from the vacuum group were under the impression that the valves had to be closed for personnel safety before any access, which is not the case. To make a long (and yet unfinished) story short, it took quite some time to open the valves to restart LEIR; afterwards, when accesses were required, people needing to enter LEIR had to wait quite some time in front of the access door. The problem is still open and discussions with vacuum specialists will take place on Tuesday October 30th.

On the “evergreen problems” side, we witnessed a comeback of the Mil1553 problem. For some yet unknown reason the RTI of several elements (ER.QFN2040, EE.QFN10, EE.QFN20, EE.QFN30, EE.BHN1020) hang and needed a reset.

ER.SMH11 was in fault because of water problems and ER.DWH12 had problems with the timing repeater. The main magnet ER.BHN didn’t work and an access was needed to restore it to normal operation. The electron cooler as well was in a sorry state but the tender and loving care of the two experts managed to bring it back to life.

There were problems with the data acquisition of several beam transformers which were solved by the experts. We noticed that it was possible to send to the element ER.SM11 not only the ON” or “OFF” command but also the “UNKNOWN” one … this is to be cured with a software upgrade to the latest FESA version that we hope will not bring any collateral effect. We’ll see this when the beam is back on Monday.

So all in all it was a very satisfactory week, thanks mostly to the availability and prompt response of many piquet services and experts, who were able to drop what they were doing to come to our immediate rescue.

Still, it was very surprising to see how many problems we had, how some old problems came back together with some un-announced and unforeseeable changes. If this is a dry run of what could happen in January, we might be in for some pretty unquiet slumbers. :-)

ISOLDE (Emiliano Piselli)

This was a quite week at Isolde. HRS users are getting beam without any major problem from the machine side. Unfortunately the target has some problem due to a new design, but users could get some physics done.

I have been called in only on Sunday morning, because, after a power glitch, the separators magnet were not responding. I did reset on the controller and users continued taking beam.

AD (Lars Varming Joergensen)

The AD had another really good week and only lost 4 hours Friday/Saturday due to a stochastic cooling power supply problem (which we are still working to resolve completely) plus a couple of minor problems that resulted in almost no lost beam.

FAULTS					
Date	Start/Duration	Symptom	System	Resolved	Comment
22/10/2012	17:00/2h	ALPHA get no beam	Extraction septum power supply	YES	Reset only helped for a short while. FirstLine called.
26/10/2012	12:58/1h	E-cooler solenoid not coming back on after power cut	E-cooler solenoid	YES	FirstLine fixed it
26-27/10/2012	16.44/4h40" (in all)	Loss of beam at high energy	Stochastic cooling vertical power supply	NO	R. Louwerse came, Piquet CO came and worked on it both Friday night and Saturday morning – no success but we managed to make it work okay'ish in local mode.

BOOSTER (Giovanni Rumolo)

The PSB had a good week with only a few minor issues.

Wednesday morning ISOLDE started 1h later than planned because of an intervention on door D901, whose access system was out of order.

On Friday, an intervention on the autotransformer Verbois 400/225 kV (Swiss electrical network) took place in the morning. This was totally transparent until the transformer was put back into the network (at 12h00), when the Booster MPS had to be switched off to avoid perturbations. The break lasted 1h20'.

Yesterday afternoon the quad BTY.QFO153 tripped and the problem was tracked to be in either the magnet or the temperature detection system. The equipment specialist needed 1h access (including cool-

down) to diagnose and fix the problem. The intervention took place immediately, as the LHC had just finished injecting and wasn't likely to request beam at least in the next couple of hours. Total 3h downtime for ISOLDE and about 1h for all other users.

This morning (Sunday) there were two electrical glitches, which required the restart of several equipments and a downtime of about 15' in total.

PS (Ana Guerrero Ollacarizqueta)

Fairly good week for the PS. In synchronization with the LHC MD on Wednesday the beam was stopped for a 4 hour intervention on the KFA45 module 1 as announced in the FOM. Two trips of the quad thermo relays caused another hour of downtime this week.

On Thursday the satellites of the LHC beam were set up again, this time without changes in the bunch length. This new beam caused injection issues in the LHC so the change was reverted. A further look into the satellite beam showed that the issue came from a wrong re-bucketing that was creating the satellites in an uncontrolled way. On Saturday morning, the set-up of the satellites on the corrected LHC beam was put in place again.

The problem of the PFWs misbehaviour causing some erratic losses is now understood. It was found to be linked to the number of vectors sent to the PFW GFAs. To avoid advancing the migration to CBORVs foreseen in LS1, beams subject to frequent working point modification have reduced the number of used vectors.

SPS (Benoit Salvant)

It was a difficult week for the SPS, with several problems causing downtime to the North Area and CNGS users in particular. The main problems were the difficult setting up of the high intensity for COMPASS, another 18 kV cable earth fault and RF transmitter issues.

Detailed summary:

On Monday from 7:00 to 17:00, there was a floating MD to study 25 ns beam with Q20 optics and perform LSS2 extraction tests for LAGUNA. There were problems with an access turnstile in ECN3 that got stuck four times in a few hours, and each time an operator had to go onsite to reset it locally. The turnstile was repaired in the afternoon. When reverting to physics after the MD, corrections larger than usual had to be applied to extract the CNGS beam. The large temperature of the only unshielded extraction kicker after the 25 ns MD could have been the reason, as the applied correction was phased out slowly during the night. During that night, the operation team opened the whole range of the TAX from 2mm to 80mm as H8 realized that they were getting very little intensity. The restart after the electrical glitch at 03:55 was very fast.

On Tuesday, COMPASS confirmed that they wanted to switch to high intensity (2.5E13 p). The steering of the beam with this higher intensity was very tedious and it took about 2 full days of tuning to find an acceptable set of parameters. During the night, the specialist was called as the ZS was in fault and could not be moved. TI and the piquet CV had to go onsite as MST6 and MSE6 water pumps were off (1h without beam for LHC).

On Wednesday, an access was organized in the shadow of a 4-hour-PS intervention to investigate a possible leak in BA1 and a potential grounding issue in BA3. Nothing special was seen on magnet 326, but three water leaks were found: one on QF20010 that destroyed a neighbouring vacuum pump, one on MBA20650, and one on MDLH210106 in TT20. The two first leaks are expected to be fixed during the next 12-hour-technical stop, but the latter required another access to better understand what can be done. MKP conditioning was also performed during 2 hours in view of the ion run. The machine could not restart after this access due to a busbar fault, and the piquets Firstline and EPC were called. It was traced to an 18 kV cable earth fault between BA1 and the BE. The piquet EPC then reconfigured the network to remove SMD1 and include the spare SMD13. Including the PS access, there was no beam during 6,5 hours for the users. During the night, hybrids for RF transmitters 1 and 4 tripped (twice). They could not be reset but they worked again a few minutes later without any manipulation.

On Thursday there was an access problem to ECN3 and TCC8. It turned out to be difficult to reach an available specialist and it took ~30 minutes to reset the PC and let people in. Common efforts to reduce losses on

SFTLONG with high intensity on COMPASS paid off and the beam was much more clean and stable during the afternoon, even though some finetuning is still ongoing.

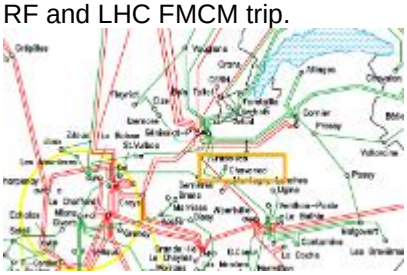
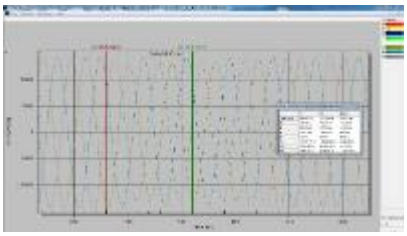
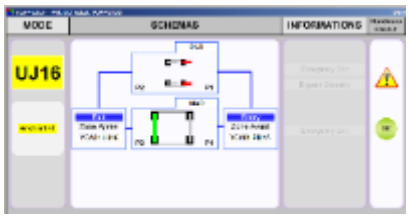
On Friday, the SPS was stopped at 10:00 for the ErDF search for the earth fault on the 18 kV cable between BA1 and the BE. Unfortunately, 8h later, the fault was still not found and beam was sent back to physics at 18:15. Another ErDF search will have to take place next week. An access was organized in BA2 in the meantime and concluded that the water leak on magnet MDLH210106 could be repaired in situ during the next technical stop.

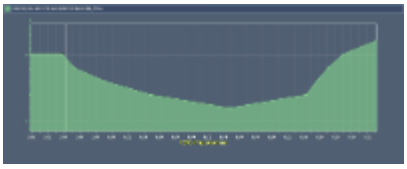
The weekend was quieter, except for the RF transmitters.

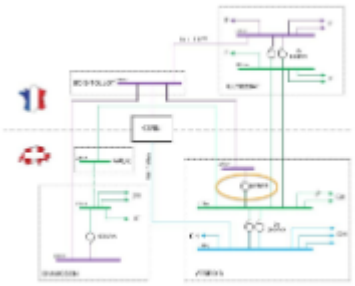
On Saturday, the EPC piquet was called to reset RF transmitter TRX3 (30 min downtime). During the night, the piquet RF was called as all transmitters had tripped twice (20 min downtime).

On Sunday, the MKP generator 2 tripped and the ZS had a vacuum fault (30 min downtime in total). The RF piquet had to come back again as the transmitters tripped many times and caused 3.5h downtime (TRX3 filament and TRX2 tube 4). He took one tube of TRX3 offline and said that a water leak should be investigated during working hours, if possible on Monday when there is no beam for 30 min. The Access piquet was called as access in ECN3 could not be granted. He rebooted the application and 10 min later accesses could be granted.

TI (Peter Sollander)

day	events
Tuesday, October 23	• 03:55 -- Electrical glitch (9% dip during 70ms). 400kV trip near Chavanod. SPS RF and LHC FMCM trip.   • 19:45 -- UJ16 PAD does not work. LHC operators call in specialist Sege di Luca to fix it. 2:45 lost for LHC according to eLogbook. No alarm seen in TI. No ODM created. Ideally, LHC operators should have gone through TI to request piquet intervention.   • 23:33 -- A couple of seemingly inoffensive ventilation alarms on BA6... 

Wednesday, October 24	• 01:15 -- SPS septa cooling circuit in BA6 fails as a consequence of a power trip that also generated the ventilation alarms from earlier. TI and CV on site to switch tripped breaker back on. LHC was about to fill so lost about an hour of time. This could have been avoided had there been an alarm indicating a problem with the chilled water production at 23:30 already. Intervention by CV in the afternoon. No real problem found, some nuts tightened and inspections made. We are waiting for alarms to be configured.  • 14:47 -- SPS 18kV cable fault. This time the cable between BE and BA1 SMB1, EMD120/BE. ERDF coming to CERN Friday 26 to localise the fault. Repairs being prepared.
Thursday, October 25	• 00:54 -- Compressed air filter in building 113 explodes, sand-blastering (rust-blastering) the hall. Fire alarms went off and fire brigade on site. The compressed air pressure on the Meyrin site dropped slightly, but the guys from the fire brigade were quick to close the valve so no real problem for the machines.    • 12:00 -- SIG calls to announce an intervention on one of the big 400/130kV transformers in Verbois to be done at 14:00, asking for authorization go to ahead. -- No GO from LHC, preparing for a long fill. The intervention must be done before Sunday. We will meet with EN/EL to see what implications there may be and how to get a slot.
Friday, October 26	• 11:40 -- SIG intervention to switch on Verbois transformer finally took place at 11:40. Like in September, the LHC compensator filters and the ATLAS Toroid magnet tripped. Cryo LHC2 tripped when the filters were switched on, again like last time. ATLAS downtime around 7 hours. Cryo can recover within that time.

	 • EDF on site to try to find fault on SMB1 cable. After several hours and tests from both sides of the cable they gave up. They will be back Monday.
Sunday, October 28	• 04:30 -- LHC beams lost to electrical glitch • 06:01, 06:08, 06:31, 06:33 -- More glitches. The bad weather causes electrical faults and perturbations.

LHC

Mixed bag including successful high beta* run. ~930 pb-1 delivered.

http://lhc-commissioning.web.cern.ch/lhc-commissioning/