Accelerator Complex Status

End week 26 (Tuesday 2 July 2018)

TI (Ronan Ledru)

Mon 25/06/18 05:48, All DAQs of TIM restarted by themselves and caused problems giving access to the SPS. The brokers seem to be running out of memory, a temporary fix was put in place, rebooting the brokers every 24 hours.
Wed 27/06/18 03:53, Electrical breaker tripped in ATLAS and caused a stop of the detector cooling for ATLAS
Wed 27/06/18 07:27, Fault on Detector cooling in ALICE, FCUE-00001. 1 pump was already broken, therefore no switch to backup pump possible. Another pump is available to be installed during next possible access for 4 hours.
Thu 28/06/18 12:50, Phoenix unavailable and lots of alarms for DAQs. Restart of TIM DB necessary to get the system back live.
Sat 30/06/18 18:59, At 16h20 fire alarm in CMS tripped the DSS and many racks. Alarm reset by fire brigade and CMS reset the racks. CMS was OK around 20h40 and 20h45 the sensor went in alarm again. TI sent fire detection piquet who changed the sensor.
Details: https://wikis.cern.ch/display/TIOP/2018/07/02/TI+Summary+Week%2C+26

LINAC2 (Richard Scrivens):

Good week, with not much to report.

LINAC3 (Richard Scrivens):

The Linac3 energy difference after ITS1 was corrected with RF setting changes, after which LEIR could inject correctly. MD measurements are needed (on Monday) to quantify the difference in momentum from Linac measurement.
On Wednesday, on the RFQ amplifier, the measurement of the filament heating failed in a way that looked like an impending tube failure. Finding the source of the measurement problem was very difficult and time consuming and the RF team worked late on Wednesday and Thursday evening to track down the faulty rectifier. Beam was back on Thursday evening thanks to their efforts.
The source performance declined before the weekend, with Detlef making many remote tunings.

LINAC4 (Silvia Schuh):

Linac4 continues its Extended Technical Stop.

Last week a "Linac4 towards operation review" took place: https://indico.cern.ch/event/735286/timetable/#20180626.detailed, on 26th June.
In terms of the work going on in the tunnel - as per information from Rolf, RF work continues to be on schedule. Cabling is ongoing for moving arc detectors to the klystron gallery.

LEIR ():

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PSB (Jean-Francois Comblin):

This was a good week for the PSB with an availability of 98.7%. Most of the downtimes came from several trips of an ejection bumper that started Saturday evening. The problem was finally fixed Sunday morning by the specialist. Otherwise we had a few minor faults that just required a remote reset.
Our attention was given to the beams required by the LHC special run of this week, as well as setting-up of beams for future MDs.
As usual, there were also several PSB MDs: Optic measurements, tune scans, studies on transfer feedback, finemet cavity setup. For the latter, it is worth mentioning that an intensity of 1.1E13 on ring 4 has been reached and this will be useful for other planned MDs.

PS (Ilias Efthymiopoulos):

A good week for PS with only about 2h down-time due to extraction kickers and RF faults. The PS delivered beam to all destinations: LHC (standard physics and special beams for the VdM scans), SPS Fixed Target beams (15e12 ppp), East Area (4.5e12 ppp), AD (14.0 e12 ppp) and nTOF (7.4e12ppp).
The key issue for the week is the loss of a vacuum window in the PS extraction line to the East Area discovered after the restart from TS1 last week, leaving about 16m of the beam in air, that could explain the increased radiation levels observed in the area (PAXR502) since the beginning of the year. As the initial window was in a non-easily accessible area a new window was placed in a location upstream in the line, thus recovering most of the vacuum. For this repair a Mylar window of 175um thickness was used (compared to 220 um of the original one). With the new window the situation for the radiation levels improved significantly, as well as the beam quality for IRRAD to the last year's levels. Unfortunately the new window did not last long, and on Wednesday (27/06) morning was broken again probably due to increased temperature. A new repair was done this time using a 250um Mylar thick window. Again the beam quality improved but since Sunday (01/07) evening the readings in the RP monitor (PAXR502) seem to increase again that probably indicates the window is again broken and we lost the vacuum in the sector. The EA team is investigating other options (Al window) that we should probably install at the earliest occasion. For LS2 a solution to remove these windows and connect all into continuous vacuum should be investigated.
On the MD side we had 7 sessions scheduled and took data during the week, plus the test of the Pb-ion beam from LEIR to investigate the Pb80+, and Pb81+ beams to SPS. A new tune of the TT2 line for the new location of the ion stripper was prepared and successfully used.

ISOLDE (Erwin Siesling):

Again it has been a very good week at ISOLDE.

GPS has been running continuously for collections of different Dy (Dysprosium) isotopes using the GLM/GHM lines for biomedical research. Some short collections of Sc (Scandium) and Gd (Gadolinium) when time permitted. Collections at GPS will stop on Monday.
Whenever possible and the central beamline was free to send GPS beam to the tapestation some RILIS laser ionisation tests on the Dy scheme for IDS would be carried out by the RILIS team.
At HRS RFQ (ISCOOL) MD has been going on the whole week by the EN-STI team. Will finish Monday-morning with a target change.

Users are very happy with the available beam and the many successful collections done. No significant interruption of the protons.
No significant technical ISOLDE issues to report.

AD (Bruno Dupuy):

For this week AD did not encounter any major problem, the total yield of the machine is not at maximum.
The next machine development period scheduled Monday between 7 H to 15 H could improve a little bit this yield.

Here some details of the AD issues:
- Wed 27 Due to the target water leak, The intensity on target is now limited to 1.25E13 on FTA.BCT9053 instead for 1.4E13.
- Thu 28 (4H48 - 7H06) 5 kW Electric Cooler Collector power supply was at fault. One fan air filter was blocked. Because this power supplies modules are located into a Faraday cage, in this procedure two people are required (also perhaps, because, the weight of one module is near to 30 kg, and there are five modules…).
- Sun 1 (16 H -22 H Total interruption > 2 hours) Many interlock of the HORN, the RESET takes until 15 minutes. Specialist Viliam Senaj diagnostics a over temperature interlock.
- Several RESET has been done on DR.QUAD and on the DR.SMI5306 injection septum from the CCC, by our friends from the PS team.

It should also be noted that the target water leak seems to be more important week after week.
But I don't have any direct information from specialists.
It seems that several teams (TI, CV) realize this tank filling.

ELENA ():

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SPS (Hannes Bartosik)

It was a very good week for the SPS with high a beam availability (more than 94%) and only minor faults in the SPS itself. Worth mentioning is only the MBB2404 power converter, which could not be restarted on Wednesday after the dedicated MD and required an intervention of the Piquet. To be mentioned also that on Friday the

RADMON in H6 gave some false radiation alarms as there were no alarms in RAMSES. The expert identified some modules not working correctly.

The beam for the North Area is running in stable conditions. Since this week the change of the spill structure, which is caused by the change of super cycle between physics production and LHC filling, is efficiently corrected by an offset in the tune function of 5e-3. This improved the spill quality especially in conditions with frequency super cycle changes.

The LHC requested a variety of beams for various special runs and their preparation, including also fills for van der Meer scans, interleaved with intensity ramp-up on physics fills. Form the SPS side this went rather smooth, apart from some issues with enhanced losses in the transfer line with the BCMS beam encountered Wednesday night / Thursday morning. A high satellite population was observed in the LHC. At the same time enhanced losses were observed in the LHC itself. Investigations are still ongoing.

The dedicated MD on Wednesday was devoted to partially stripped ions. Both Pb80+ and Pb81+ could be successfully injected into the SPS after deploying special transfer line optics to accommodate the different charge states after the stripper. The MD was quite successful and the lifetime of the two beams could be measured on an intermediate flat top (lifetimes of about 200 s for Pb80+ and about 600 s for Pb81+). This was an important milestone in view of the gamma factory proposal.

The long MD on Thursday was devoted to high intensity BCMS studies (up to 2e11 p/b) and four batches. Still there is quite some emittance growth on the 20s flat bottom. To be mentioned that there was no increased sparking observed on the ZS extraction septa, which is good news for future parallel MDs. On Friday the setting up of Pb82 for the physics run at the end of the year continued. The RF voltage on the accelerating cycle had to be reduced in order to avoid tripping cavity 2. Aperture measurements to assess the impact of the TS1 interventions were performed on Saturday for the vertical plane. The data analysis is ongoing.

LHC (David Nisbeth & Jorg Wenninger)

The issues with the longitudinal blow up in the ramp on B1 were traced to a significantly lower Qs on B1 (~10Hz) for which caivity Cav2B1 was found 167 degrees out of phase (filter issue on FPGA). A reset of the FPGA resolved the issue. A similar issue was found on Cav8B2 for the full detuning, a problem that reappeared later during the week and triggered a dump of a 1200b fill.
The first 3b fill came in Monday evening, followed by the 140b calibration transfer fill Tuesday morning. The 600b fill was done Tuesday evening. Wednesday and Thrusday the 1200 and 2460 bunch fills could finally be completed.
Loss maps for vdm were completed Monday night. Loss maps for the 90m were performed partly on Friday, but the asynchronous dumps had to be repeated Saturday and Sunday night.
The ALICE & LHCb vdms finally started Friday afternoon, the CMS and ATLAS scans started Saturday morning and finished Sunday morning after a 22 hour long fill.

At the of this week we have accumulated in lost time the equivalent of the duration of TS1 (~ 4 days).
Over the weekend CMS suffered twice from a false fire alarm that switched off major parts of their electronics, hampering the specials physics run.
All loss maps are finally completed and the 90m program starts today.
Below an overview of the difference between planned and executed:

Wk	24	25		26		27	
	Actual	Plan	Actual	Plan	Actual	Plan	Actual
Mon	11	18	18	25	25	2	90m
Tue	2556b	TS1	TS1	2460b	setup		
Wed				90m	ATLAS/ALICE	2556b	
Thu					2460b		
Fri	MD1	recovery	recovery		VdM		
Sat		VdM	recovery		VdM		2556b
Sun			setup		CMS		