Accelerator complex status

End week 48 (Sunday 30th November 2015)

TI (Peter Sollander)

Only three major events noted last week, a couple of access problems and the stop of North Area demineralised water (BA81)

https://wikis.cern.ch/display/TIOP/2015/11/30/TI+summary+week+48,+2015

LEIR (Django Manglunki)

Until Sunday afternoon, a very good week for LEIR which eventually retrieved the NOMINAL beam performance of 5e10 charges extracted (~5e8 ions/bunch) for the LHC, while the EARLY was used for the North Area fixed target.

Also, the MDNOM, MDRF and BIOMD cycles were used for more studies on transverse feedback/blow-up, optics, RF, injection efficiency, electron cooling...

- On Monday 23/11 TE/EPC confirmed the 300 mA 50Hz noise observed on the current of ETL.BHN10 was due to a measurement problem on the samplers and was not impacting the actual field seen by the beam.
- On Thursday 26/11 the extraction trajectories were re-optimised, from the machine (bump + kickers) to the transfer lines towards the PS, before asking the PS to retune their injection oscillations.
- On Sunday at 13:30 the RF cavity ER.CRF43 tripped on a non-resettable HV fault, unfortunately during a LHC filling attempt. It could eventually be restarted in local, but caused 50' beam down time.

It tripped again at 21:09 while the LHC was in stable beams, and the specialist had to call the TE/EPC piquet. 3h beam down time for the North Area (1h of which in parallel with an SPS chain 11 problem which was stopping the North area anyway).

During Sunday night, the LEIR situation degraded in a peculiar way: the EARLY beam was ok, as well as the first NOMINAL cycles, but the injection efficiency of the subsequent NOMINAL cycles became lower and lower. While investigating the reasons, ETL.BHN10 and CRF43 tripped with no possible remote reset; they had to be restarted locally. Eventually the problem was solved by retuning the injection line. Once again the North Area was hardly affected as it was experiencing beam stopper problems tripping chain 11 at the same time, but the LHC filling was delayed.

PS (Ana Guerrero Ollacarizqueta)

Quiet week in PS delivering only ions to the SPS and LHC. For the nominal ion beam the normalized emittances measured in TT2 are 0.7 and 0.8 um in the horizontal and vertical plane respectively.
On Wednesday afternoon the beam was down during two hours due to a failure in the access system which drove ADT to fall-back mode and TT2 to beam-off as protection. On the access console ADT could not be withdrawn from access mode (to be able to switch TT2 again to beam mode) as the condition hardware loop resultant EIS-a was not fulfilled even if all EIS were notifying OK

condition. The access piquet and the specialist were called. The main 48V circuit breaker of the AD Target hardware loop switched off either due to a short-circuit or overload.
BHZ377 interlock test continued: The bending goes to zero when the interlock coming from the SPS kicker arrives however coming out of veto does not trigger the cycling when the following cycle destination is again SPS.

SPS (Verena Kain)

Monday was the last day with protons in the SPS. Since Tuesday of week 48, the LHC is taking the ion nominal beam with 12 injections. The re-phasing issue affecting both ion cycles, the early and the nominal, after not having had any beam on one cycle was due to the dynamic economy and the slightly different magnetic history in that case. Nevertheless the re-phasing only started to work consistently every cycle, when on Friday it was noticed by the RF expert that part of the re-phasing had not been properly configured for ions.
More studies were carried out during the week to further decrease the batch spacing between two injections into the SPS. The damper was successfully commissioned for ions Tuesday night. With the damper at hand, 150 ns batch spacing could be achieved in the SPS. On Sunday a filling scheme with 150 ns batch spacing was tried in the LHC. Unfortunately it had to be abandoned again due to high losses on the transfer line collimators and hence in the injection region. They are probably caused by horizontal tails due to the large oscillations of some bunches at SPS injection with 150 ns spacing. Scraping could not be deployed, as it would significantly decrease the intensity of a few bunches. Eventually it was decided to go back to 225 ns batch spacing. The intensity achieved thanks to the damper is now > 3e+11 charges at flattop.

On Wednesday the UA9 cycle was prepared and tested with beam to be ready for next week's UA9 run.

Downtime: 55 minutes for primary ion interlock BCT seeing a spike. 2 1/2 h due CPS access chain issue. 42 minutes for electrical discharge switch on MKD dump kickers. At least 4 h for LEIR RF (total time for LEIR RF to be updated on Monday - intervention still ongoing).
SPS Cavities 3 and 4 with/or their corresponding transmitters tripped again frequently this week.

The SPS had a very rough Sunday night: re-occurring issue with a dump in H8C that cannot be moved into safe position anymore. It tripped chain 11 and hence stopped NA physics. Problem could not be solved until now. Discussions are ongoing with the DSO to see whether it can be removed from the access chain.
The LEIR RF problem was solved shortly after midnight, nevertheless the beam out of LEIR is not as good as it was before.