

## End Week 35 (September 5<sup>th</sup> 2011) – Status of Accelerators

### Linacs (A. Lombardi)

#### Linac 2:

During the technical stop started tues 30/8 the source hydrogen bottle was changed. Source back and pulsing around 2 pm. The linac was restarted on 31 /8 , beam available around 15.

Saturday 21:00 power supply LA1.QFN06 failed. Beam was back after 20 minutes after power supply was changed for a spare.

#### Linac 3:

Oven was refilled during the technical stop. Beam was available again on Thursday morning. There was an issue with slits,solved eventually. If you need more details on the latter you need to ask Detlef as he is the one who followed the matter.

### PS Booster (J. Tan)

Busy week for the Booster.

#### Tuesday

Technical Stop

#### Wednesday

After the lift patrol t ~4PM, we started to switch on the PSB. Piquet Power called for the multipoles. After his intervention at 6:30PM, the beam stopper still remained closed downstream the Linac bending LT.BHZ20 caused by a discrepancy between the "security chain" and "MTG diagnostics" programs. Piquet Control and the operator followed the (big!) cable between MNR11 and MNR3, here it goes into the CFV-354-CTMECM, slot11, into a ICV196 card. Just to try their luck they changed the ICV196 card and after this there is no more problem. While trying to set a NORMGPS beam, there were several issues to be resolved: timing issues with the ejection kickers, INCA issue for doing a PPM copy. At 10:45PM the machine was finally ready for physics.

#### Friday

The new PSB Vistar has been debugged till Friday. While ISOLDE was using high intensity beams, there was a radiation alarm because an alarm threshold was not correctly updated.

#### Saturday

In the morning, the 2MHz cavities of rings 2 + 4 tripped. The specialist was called for the ring 2 cavity and fixed a circuit breaker which had tripped. Down time 1h. This issue happened again with the same cavities in the evening, but they could be reset remotely. After the 3rd trip at 1:AM the operator went on site and rearmed a 20V power supply. Down time 30'. At 4AM, the same cavities dropped again but could be restarted remotely. To be followed up by the specialist next week.

#### Sunday

Same cavities but different issue: air flow problem twice. The operator could restart them remotely. The total down time was ~1hour.

### **Monday**

At 4:45AM, flat top of BT4.SMV10 is unstable leading to bad ejection trajectories. Specialist called in.

### **ISOLDE (P. Fernier)**

**GPS:**

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**HRS:**

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**REX:**

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### **PS (Y. Papaphilippou)**

The main event of the week for the PS was the POPS break-down.

After a smooth MD session on Monday, all beams were cut on Tuesday at 5am for the 2-day technical stop. The beams were back gradually on Wednesday night, after some tests on POPS, where a voltage regulation loop was added. At the same time, MTE stability measurements were conducted, with different super-cycle compositions.

Already during the start-up, it was observed that the field arrival on the flat bottom was presenting fluctuations, up to around 60-70ms after the injection point and with amplitude that was even more important than before the intervention. Similar fluctuations were observed in all arrivals to flat tops. Especially at injection, problems with the RF synchronization were observed on Thursday afternoon in LHC beams, causing batches to be placed in wrong buckets. The POPS experts were informed and scheduled an intervention during Friday morning, when it was successfully achieved to bring the fluctuations back to the levels before the technical stop and even improve on this after an additional intervention during the afternoon.

Unfortunately, the POPS tripped after less than 30min of functioning. The cause was attributed to a small fire on an IGBT cabinet, due to the debris of a melted multi-contact which fell on a busbar and started burning the support. Luckily, the power team was in the surroundings and put out the fire. At least another multi-contact was found in a similar bad state and the power experts decided to stop POPS for investigation and restart the MPS. This was done in around 3.5h and the PS was back up and running in Friday evening, after some standard adjustments with respect to injected trajectories and LL RF.

The only additional event to report was a trip of the PFWs on Sunday morning without possibility to reset. The piquet power was called and traced the problem to a faulty power supply controlling the thermal faults of the PFWs. After a replacement, the power supply died again and after some investigation replaced by a provisional one. The beams were back after around 2.5hours stop.

### **AD (B. Dupuy)**

**Wednesday** 31/8, Technical stop, vacuum leak (1E-5) between QFW and BHW in sector 48. Fixed by J.Hansen.

**Thursday** 01/9, restarting the ADE at 09H00, beginning MD sessions, with a little delay.

The end of this week was marked by many PSB / PS beam interruptions. POPS, PFW, Cavities, stopped the beam several times.

### **LEIR (C. Carli)**

At the beginning of the week, before the technical stop, the beam currents from Linac3 were low leading to low currents from LEIR as well.

After the technical stop and a refill of the Linac3 ion source, a higher beam current (up to ~ 25uA) was available from the Linac. Then the EARLY beam could be generated without problems. The intensity for the USER NOMINAL is still a bit low (some losses during accumulation, but even more the "usual" loss at the beginning of the ramp). No investigations due to lack of time and controls problems (minor, but some time required to solve) on Friday afternoon.

### **SPS (K. Cornelis)**

Most of the week was spent in MD or technical stop. On Monday several coast cycles were set up, which were to be used for different MD's during the week. Monday night, optics knobs were tested in TT20 as preparation for the fragmentation run.

On Tuesday and Wednesday we had two days of technical stop. The main intervention was a quadrupole change in 5.06. The beam came back on Wednesday night and we used the fixed target and LHC 50nsec cycle to measure the alignment of the quadrupole. The error was found to be 0.04mm and we decided to leave it like that. On Thursday UA9 took the beam. During the day there were some problems with unwanted beam dumps. This turned out to be caused by a water flow meter, giving intermittent interlocks. The problem was fixed in the evening and UA9 could continue with unperturbed coasts throughout the night. Most of Friday was lost due to problems with POPS.

Saturday morning physics conditions were re-established. After a whole week stop, TT20 needed some adjustments to avoid losses on splitters, but around noon everything was back OK. There were some problems with the MKD energy tracking interlock. The problem was solved (but not completely understood), by changing some dump timings and coming back. The rest of the weekend was very smooth. The only problem was that the PS could not deliver the full CNGS intensity because of beam losses. We had to run with 3.5 10E13 ppc instead of 4.2 10E13 ppc.

### **LHC (J. Uythoven, J. Wenninger, J. Coupard (technical stop coordination))**

Main issues:

- Technical stop Monday - Friday.
- Smooth recovery from technical stop, TS, recovery from TS, 1 m beta\*, Alice polarity change

More details under: <http://lhc-commissioning.web.cern.ch/lhc-commissioning/>

**TI (P. Sollander)**

Busy week for TI due to the technical stop, but no major problems. Increase in number of telephone calls and number of work orders. Big increase in number of interventions on the access control system due to the technical stop.