End Week 21 (May 24th) – Status of Accelerators

Week dominated by replacement of booster injection septum.

Booster (Bettina Mikulec)

The week was dedicated to the exchange of the PSB injection septum that had developed a water leak on Friday 15th of May.

Monday: radiation cool-down, stop all beams.

Tuesday: exchange of septum magnet assembly with its spare. Start pumping.

Wednesday: The vacuum level in the morning was ~8 10^-5 and didn't improve much with time. Towards the end of the morning a new vacuum leak had been confirmed in the mechanism pulling in and out the MTV screens that are installed just behind the septum magnets in the same tank. In the afternoon it has been decided to exchange this mechanism (and venting again the septum tank) because the MTVs might be needed to diagnose potential problems with the new septum and an intervention at a later stage would lead to a considerable dose to the intervention crew. Moreover the involved persons had fresh experience with the various working steps.

It could be confirmed that the new septum had no more water leak.

In the meanwhile pumping continued until Friday.

Friday: The vacuum level reached ~5 10^-6 in the sector and ~1 10^-5 close to the septum in the morning.

All the spare parts for the MTV pulling mechanism could be found and the leak on the installed MTV mechanism was confirmed. Venting started in the morning and one door of the septum tank was removed to be able to extract the screen assembly. This intervention was successful and the bellows of the MTV mechanism showed no vacuum leak after having closed the septum tank. Leak detection went on in the afternoon resulting in the detection of only a tiny leak at one top corner of the tank, which was already present the day before. This leak might be due to some machining imperfections of the cover, but should not be critical. Pumping started in the afternoon. The PSB pit was again closed by transport.

Saturday: Another leak test was performed at 9am. No more leaks have been observed (average leak level same as last 10 years) and the vacuum level has decreased. Flashing of the ion pumps. In the evening the vacuum group checked the vacuum level and managed to get the ion pumps working. The decision was taken not to bake out the extraction septum.

Sunday: In the morning J. Borburgh connected the injection septum and tidied up the area. He informed us that the vacuum level in the whole sector was such that we could try putting beam into the machine. The most critical area is around the extraction septum where the vacuum level was just at the set level of <5 10^-7. In order to save beam time an effort was made to get all the required persons and piquets gathered to de-consign the relevant equipment and to clear all the interlock conditions. Distributor, injection and extraction septum as well as BTP.QNO20 needed special

interventions to be operational. At 18:40 we removed the beam stopper. At 19:30 EASTA could be injected and extracted. SFTPRO and AD needed only minor adjustments in the injection.

Currently we keep the supercycle as empty as possible and run at reduced intensity. The vacuum level at the extraction septum is under steady surveillance. As it decreases only very slowly, I don't have an estimate when high intensity operation will again be possible. Maybe intensities can be increased steadily if the vacuum level stays low, but I would like to confirm this before.

Apart from the problems related to the injection septum all the planned interventions in the PSB (advanced from technical stop) could be completed. Concerning the sieve the water cooling was disabled and air cooling with 2 fans been put in place. Temperature sensors were added and wired up. The sieve is not yet operational - the PLC has been ordered and correct readout of the sensors has still to be confirmed.

PS (Gabriel Metral)

Beam stopped Monday morning (for the booster intervention on the injection septum)
Modification done on the function generator of the PS Main power supply

New Polarity measurements done on the equipments BSW57, PE.QSE, PE.QKE16CT

Test of the Pedestal PE.BFA9P on the operating mode MTE (on that operation, this equipment pulse 2 times, one before the arrival of the beam in the machine and a second time at extraction. This is needed to stabilize the current of that equipment)

Test done on the CVORB card of the BDOT function generator by CO (still scaling Problem)

Restart of the SFTPRO beam this morning (not yet extract, problem with the extraction bump)

Isolde (Emiliano Piselli)

Nothing to report for this week regarding Isolde...

We did HRS target change on Friday and same stable beam through RFQ to RexTrap.

There was something for REX as well:

D.Voulot:

"Vacuum incident on the 9-gap on Wednesday. Too much power was fed into the cavity which was overheating and due to thermal expansion the silver seal on he cavity failed (well that's what we think). This is a known problem it has already happened two years ago. So I have spare parts and I know how to fix it. The problem is that we need to remove the shielding. The roof of the concrete tunnel was already removed on Friday. The lead shielding will be removed tomorrow either using a cherry-picker or with a scaffolding. This will be decided tomorrow (after consultation with transport and safety people). Then we need to do a leak test to confirm that the leak is really on the cavity, some RF measurements to be sure the cavity has the same rf properties before and after the intervention, open the cavity, change the seal, close it again, pump down, leak test, rf measurements and rebuilt the shielding. I estimate this could be finished by Wednesday night. So the run could start as scheduled on Thursday night (optimistic) or Friday night (more likely)."

Technical infrastructure (Peter Sollander)

• Monday 18/5: 18kV trips on over current caused by a cryo comressor starting. The over-current settings were adjusted and should not trip again.

• EHT5, one of the two main 400/66kv transformers was stopped due to a problem (leak) seen during an inspection. The remaining transformer, EHT4, can supply LHC and Meyrin and is currently at 80% charge. Repair has been initiated and will take 2 months. Additional charge such as the LHC cryo plants starting up before the transformer is repaired, may require EL to reconfigure the network. Different solutions are possible.

LHC (Monday morning meeting)

Good progress in S34. MPAQ passed successfully. ELQA under a lot of pressure this week.

Connection cryostats: Insulation fixed points mounted. S56 – ready to perform ELQA before re-welding. 10 days before W bellows closing.

S67 – endoscopy – plastic shimming, small RF fingers, coloured areas. 21 PIMS cut so far. 41/34 % coverage so far.

80K radiation/thermal screens – some damage during warm-up & cool-down. Improve assembly procedure of screens (over tightening). Plus application of progressive cool-down…

10-12 interventions in S12 for splices. All this has impact on closure schedule. Should get quadrupole lines measured before closing W bellows.

S56 – looks like we have a 32 micro-ohm splice that has seen an 11 kA quench – work in progress. (Have opened 11 interconnects.) Nothing visual at the 30 micro-ohm level. Everything over 20 micro-ohm is re-done.

Cold measurements – work in progress. Keep S45 stable to continue measurements. Continue cool-down of S23.