Summary of the 11th FOM Meeting

Held on Tuesday 6th June 2017

Agenda (https://indico.cern.ch/event/644029/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Technical stop report*
4. *Schedule update*
5. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The list of presence can be found in Annex 0.

The minutes of the 10th FOM were approved.

2. Status of the machines.

Linac2 & Linac3

R. Scrivens reported the status of the linacs (Annex 1).

It was a good week for Linac2. During operation there was only a small stop of quadrupoles due to a water interlock. It only appeared once, and a check during the technical stop day showed nothing abnormal. For Wednesday and Thursday work was done on the tank 1 intersection secondary vacuum to halt corrosion. The secondary vacuum is not fully leak tight, but is already back filled with N2. Some more work will be needed. The RF interference on BCTs was mitigated with filters and they now read accurately.

The Linac3 week was not so good, as only about 2 days of beam production was possible. Monday and half of Tuesday was dedicated to repairing the RFQ amplifier (short circuited capacitor in the amplifier coupling cavity). During the Wednesday stop the pepper pot was installed and the source spare microwave generator reconnected. Linac3 restarted on Thursday afternoon, and ran without problems the rest of the time.

LEIR

S. Pasinelli reported on the LEIR status (Annex 2).

The week was dominated by the Linac3 RFQ amplifier fault. The recurrent fault on ITE.BHN30 was solved by an EPC expert on Thursday. Since Thursday 3 faults occurred on the ER.QFN2040 & ER.QFT20 power supplies, which should be followed up.

PSB

B. Mikulec presented the status of the PS Booster (Annex 3).

Injection energy matching was done on Monday; last year's injection frequency values were confirmed. The LHCINDIV beam was prepared on all 4 rings for PSB-PS energy matching measurements. During Tuesday night the ejection septum was pulsing with 1000 A more than programmed requiring 2h30m piquet intervention (disruptions for UA9 run). During the ITS1 on Wednesday the R1H and R4V wire scanners were successfully exchanged. ITS1 had quite some disruptions for the PSB: after the restart on Thursday around 2pm BR2.C02 had issues with the HV; as a consequence 3 thyristors broke, but only 2 spares were available. It was decided to immediately set up TOF on R3 and the extraction and recombination for LHC25 for rings 3,4 and 1 (3+3 injection into the PS), and on Friday the RF team managed to put into operation the spare C04 power converter. BR2.C02 is working since, and the RF team will follow up the thyristor order, the setup of the Finemet cavity and the understanding of the HV problem. A few power supplies tripped after the electrical glitch on Saturday.

C. Rossi commented that it was the C04 spare power supply that was installed on the C02.

K. Cornelis said that the C02 issue should be treated as a blocking fault, as not any useful beam could be produced for the LHC with the 3+3 injection because of the very large vertical beam size. He will discuss with **B. Mikulec** about the correct way to handle the fault.

ISOLDE

A. Rodriguez reported the status of ISOLDE (Annex 4).

On HRS side: The separator was set up on Tuesday. Stable beam to the COLLAPS users was sent on Wednesday and Thursday (during the technical stop and intervention on the 400 kV electrical network). Radioactive beam (several Al isotopes) is produced since Friday.

On the GPS side: there was no physics during the week. An MD took place on Monday and Tuesday. There were no major problems with the accelerator itself. Only a few issues with the RF amplifiers of the cooler/buncher, a couple of power converters faults and an issue with the controls of the separator dipoles. However, users have reported target yield lower than expected.

ISOLDE Users

K. Johnston said that, this week, the main experiment was on HRS where laser spectroscopy was done on Al isotopes. It was a difficult week with quite a few small problems on the machine and with the lasers for ionization. In addition the target appeared to be under-performing and the planned program on 26Al wasn't possible. The experiment concentrated on other Al isotopes such as 28-31Al where some systematic measurements were made, but the main physics goals weren't achieved in the end.

PS

F. Tecker reported the status of the PS (Annex 5).

The PS had an eventful week, with the technical stop prolonged until 14:00 due to EDF work on the 400kV line. A POPS issue delayed the restart until 17:40. Since the restart, the beam was degraded for 20.5 hours due to a PSB ring 2 problem. This was mitigated by the common efforts of the PSB and PS teams to set up LHC 25ns 72 bunch beam with 3 + 3 bunch injection from the PSB and NTOF beam from PSB ring 3 reaching the nominal intensity.

The main issues in the PS this week were: a LLRF H8/H16 switch that got stuck (2:45 downtime for LHC, AD), a PFW (WDW+W8L) trip and regulation issues (0:45), a C10-96 circuit breaker (1:30, 0:30 for EAST1, EAST2, LHCIndiv_Awake), a SMH16 vacuum interlock during MTE setup with higher intensity (1:20 except EAST), a KFA21 HV interlock, changing it to its spare (1:15 only MTE) and a fault on ZT8.QDE01 (1:08 only EAST1).

During the technical stop, a vertical vacuum chamber misalignment in section SS01 by 1.5/2mm and SS20 by 3.5/5mm was corrected (partially in SS20).

LHC beam was delivered and 12 and 48 bunch BCMS. The operational high intensity MTE beam is ready for the SPS with 1.8e13. The Xenon ION cycle was prepared with the flat top field adjusted for the correct revolution frequency and the beam sent to the D3 dump. The NTOF integrated intensity follows the planning.

K. Cornelis confirmed that the SPS intensity ramp-up is on-going with 1.7-1.8e13 this week (ultimate goal being 3.5e13).

East Area

B. Rae said that there were several trips and three first line calls for ZT8.QDE1 (3 hours with degraded beam). The low-current regulation problem on ZT9.QDE5 was successfully fixed during the Technical Stop. The ECR for delivering ions to CHARM has been approved by the IEFC on Friday and correspondingly the beam request can be transmitted to the SPSC.

East Area Users

H. Wilkens said there was good progress on the test beam program.

nToF Users

F. Mingrone said that is was a pretty smooth week. There is a small issue with vacuum that should be fixed during the next planned beam stop.

AD

T. Eriksson reported the status of the AD.

The AD availability was 100%. Yesterday, the ALPHA experiment observed beam position fluctuation.

AD Users

H. Wilkens said that everything went fine.

SPS

V. Kain reported the status of the SPS (Annex 6).

On Monday the SPS delivered 72 bunches to the LHC for the pre-scrubbing and prepared BCMS 48 bunches for the physics fills planned during the COAST and the technical stop. Fixed target beam was stopped at 9:20 on Tuesday morning. The UA9 run started ~ 2 h later due to the filling with the LHC. UA9 had COASTs with Q26 and Q20 optics. The final filling for the LHC before the technical stop was finished at 5:40 on Wednesday morning. Unfortunately the LHC lost the beam shortly afterwards.

One of the main goals of the technical stop in the SPS was to cure the main vertical aperture restrictions in the SPS that had been detected with the aperture measurement at the beginning of the run at locations 133 ad 511. MBB.13350 was exchanged as a non-optimum weld had been detected with an endoscopy at the end of the EYETS. The inspection of the pumping port next to MBB.51130 showed non-conform RF fingers. The non-conformity was repaired.

Beam was expected back at ~12:00 on Thursday. But due to an intervention on the 400 kV network, the restart was only possible from 14:00 on Thursday afternoon. Beam was finally back in the SPS at ~17:35 with lower intensity due to the missing ring 2 from the PSB. AWAKE beam, LHC single bunches, fixed target beam and the low intensity MTE beam for aperture measurements were requested straight away. The aperture measurements revealed that indeed the 511 aperture restriction had been removed, but the 133 bottleneck is unchanged.

LHC also requested 72 bunches, which could not be delivered because of an interlock problem with the "TI 8 BLM up" BIC input that could not be reset. It could be masked for lower intensity. Eventually the problem disappeared, but it is still not understood despite expert investigation on Friday.

The low level RF setting up on the LHC25NS cycle is not finished for 288 bunches. Experts were working on Monday and Friday afternoon when finally PSB ring 2 was back and the beam quality was adequate.

Friday from ~8:30 to ~19:00 another ZS scan was performed. The losses could be improved by moving mainly ZS3. The situation is however still not optimum.

The intensity on fixed target will not be increased before Wednesday due to the request of a North Area user for very stable conditions. AWAKE is running with ~3e+11, various scans transversely and longitudinally with proton beam versus laser are being carried out.

The BCMS emittances on Sunday were ~1.5-1.6 um with bunch intensity 1.1e+11. LHC wire scan measurements confirm the SPS bunch-by-bunch measurements.

The longitudinal set-up of the 288 bunches beam will be checked today.

H. Vincke asked what could be done to reduce the activation at 133, especially in view of the intensity ramping-up**.**
K. Cornelis answered that this hot spot has always been there, but it was less visible last year because of intensity limitation. An endoscopy should be planned during the next TS. In the meantime, one

should steer properly the beam in order to reduce the losses in this area, as it was done in the previous years.

North Area

B. Rae said that the cooling issue is followed up by CV and magnet experts will have a test with the increased pressure this week. The NA62 had several trips of 2 magnets (BEND02 and TRIM05) that induced a 3 hour stop. On several occasions all PC in BA82 went into data bus failure (affecting NA62 and COMPASS). Currents are in principle ok, but each time first line was called.

North Area Users

H. Wilkens said that everything went fine. The NA63 experiment needs a low emittance electron beam.

AWAKE.

E. Gschwendtner said that AWAKE had a very good physics run. They started with the plasma cell and with the self-modulation measurements and got many interesting results from many different scans. They appreciated a lot having two AWAKE cycles in the SPS when needed. They suffered with several downtimes due to the extraction kicker. The Rb in the plasma cell now needs to be refilled. As it might take some days they propose that the bunch rotation MD takes place on Thursday or Friday.

V. Kain commented that the extraction kicker issue might be related to the 2 AWAKE cycles; **E. Gschwendtner** replied that in that case they would prefer to keep the 2 cycles and have some compromise on the beam quality.

LHC.

There was no report.

TI

J. Nielsen reported on three main perturbations (Annex 7).

On Wednesday, a 400 kV perturbation (8.6% voltage dip over 80 ms measured internally at LHC2) was confirmed by EDF-RTE (a breaker opened on a 400 kV line).

On Thursday the EDF-RTE intervention delayed the injectors restart.

On Saturday, a 400 kV perturbation (8.7% voltage dip over 60 ms measured internally at LHC2) was confirmed by EDF-RTE (a breaker opened on a 225 kV).

3. Technical stop report

Linacs

R. Scrivens already reported the main TS linacs interventions in the machine status (Annex 1). .

LEIR

S. Pasinelli reported that all the TS interventions took place expected the one on the BCT10 cabling swap.

PSB

There was no report.

PS

S. Mataguez reported that everything went fine. A water leak from the ceiling was detected. Unfortunately, the water drops on an activated vacuum chamber. In order to avoid corrosion of the beam pipe, it should be fixed during the next TS by adding a cover above the pipe (SMB group is following this up).

SPS

D. McFarlane said that all the interventions were completed on time.

4. Schedule update.

B. Mikulec presented the injector schedule version 1.1 (Annex 8).

H. Bartosik said that there will be a dedicated MD in the SPS. The COLDEX run on week 25 will be postponed.

5. AOB

There was no AOB.

Next Meeting: Tuesday 13th June 2016.

Minutes reported by JB. Lallement on 8th June.