Minutes of the 27th FOM meeting held on 20.07.2010

Agenda:

1) Follow-up of the last meeting (K. Cornelis)
2) Status of the machines (Supervisors)
3) Schedule (K. Cornelis)
4) Special Topics: Report about the PSB MPS failure.
5) AOB
6) Next agenda

1. Follow-up of the last meeting

The minutes of the 26th FOM meeting were approved.

Follow-up from the last FOM:

a) Status of the PS B-field fluctuations.
An MD took place after the technical stop on 19 July. S. Gilardoni reported that preliminary results show that the beam radial position on a given user depends on the magnetic field of the precedent user in the supercycle. This effect does not depend on the powering of the pole-face-windings or the figure-of-eight loop on the precedent cycle.
S. Gilardoni wanted to thank O. Michels for the contribution to the tests and the installation of the new sampler acquisition, and the piquet power for the support during the MD.

b) PSB-MPS status. See Special topics.

c) Isolde Watchdog status. The specialist is still investigating the problem.

d) Status of BT.KFA20. After the replacement of some thyratrons, the kicker did not tripped any longer.

e) Status of AD bunch length. B. Dupuy reported that the bunch length is still too long but some reasons for this have been identified and under investigation.

f) Status of beam references in INCA. See PS report.

The beam statistics can be found here.

2. Status of the machines

Linac2 (R. SCRIVENS):
The Linac was running without any particular problems until Friday when the 380V distribution in supply to Hazemeyer failed. The power was switched to the spare one.

PSB (A. FINDLAY):

The PSB week was pretty busy due to the problem with the MPS. Already on Tuesday, due to the frequent trips of the MPS, an audio-visio patrol was done in the tunnel to verify the status of the magnets. At the same time, the MPS was checked for an eventual ground fault. The search was interrupted in the evening, with the goal of restarting the machine to provide beam for the physics and resetting the MPS whenever tripping. Unfortunately, the MPS was tripping every two minutes. The supercycle was then reduced to only a single LHC beam to fill the collider. Even the intervention during the night of the piquet power did not solve the problem. On Wednesday, the Q strips, the Bdl and the trim power converters were disconnected and the MPS could pulse without any problem. During the quadrupole power converter tests, a series of other equipments failed. After their repairing, the ground loop problem was identified in the quadrupole circuit and solved (see Special topics). The machine could not provide immediately the beam due to the polarity inversion of the QD circuit. The problem could be debugged thanks to the Varilog.
The MPS run could run since the repairing without any particular problem.

On Friday BT.KFA20 dropped few time. The specialist could fix the problem.

After the technical stop, the multipoles tripped due to a problem with the cooling water. Then the piquet power had to intervene for a problem with ring3.

ISOLDE (E. PISELLI):
ISOLDE had a pretty good week.

HRS: The beam could not be delivered to the user (MINIBALL experiment using REX) because as in the previous week, the production of the Krypton^{72} was hampered by a high contamination of Germanium^{72}. According to target experts this isotope contamination could not be predicted.

GPS: a target change was done on Thursday and the setting up with stable beam was done on Friday.

ISOLDE USERS (A. HELERT):
The users of HRS were not happy due to the lack of production of the desired isotope. The ISOLDE operation was in any case very good.

PS (S. GILARDONI):
The PS had a pretty good week, without any particular problem, except, with the machine operation depending on the PSB availability.

Three problems should be mentioned: a) on Monday, an access was needed to change a gap relay of a 10 MHz cavity. S. Gilardoni wanted to thank the RF specialist for his patience and availability. The intervention, in fact, was planned and then postponed by few hours to allow the LHC filling; b) the MTE-MD4 user was found corrupted again, on Friday. This time, the Bfield was found set to zero; c) the MPS tripped on Sunday night due to a water fault.

The INCA deployment is progressing. In particular, there were further investigations to solve few problems related to: a) ppm copy. It was found that during a ppm copy some of the settings was not correctly copied; b) coherency between knob colour,

settings and reference value; c) consistency between GFA settings saved in the database and knobs.

The source of the first corruption of the MTE MD4 user of last week has not been understood yet. By further investigations, it was found that also a second user, the MD3, was corrupted, or saved in the INCA database with corrupted settings. The MTE setting-up continues. However, after the user problem of last week, it was not possible yet to restore the situation prior to the user corruption. The spill is still more instable than before the corruption.

On Thursday a problem with the wire scanners was found: depending on the speed of the wire used one can get very different emittances at extraction for the LHC beams. In fact, the emittance measured decreases on the extraction flat bottom up to 15%. The BI expert is working on the problem, but the BI expert suggests that the instruments lost their mechanical calibration. At the same time, the BI expert solved the problem on the BWS64. The huge peak appearing on top of the Gaussian beam profile shape disappeared. The solution was to increase the speed of the cooling fan of the electronics rack.
The same day, the orbit on TOF at injection was found again with a peak-to-peak of about 20 mm, as at the beginning of the year. Investigations are ongoing to understand how it is possible that the orbit degrades without any apparent reason.

On Monday, during the technical stop the video signal of the access system interrupted few times. The access system could not be operated is a safe way and the patrol of the PS ring has to be repeated. In fact, the video signals became un-available while some colleagues were accessing one of the doors.

S. Deghaye reported about the mentioned problem on MD4. The MD4 user was found corrupted but without any trace in the production or the development INCA database. The MD3 user, instead, was saved already corrupted when was archived in the database.
According to this, S. Deghaye, said that the corruption of the MD4 settings could not be produced by INCA but has not been understood.
The problem related to the MD4 Bfield set to zero has been understood. A bad manipulation during the INCA tests on the application setting the Bfield caused the problem.
Concerning the problem of the references, S. Deghaye said that not all the beams have been saved in the references. This was a choice done in agreement with R. Steerenberg. Due to this, the control system is assuming that the current settings in the knobs are the references. In case that a setting is not the correct one, the system cannot recognise it as different than the reference, so the colour of the knob remains green. S. Deghaye said that the beams will be saved once OP will save them again.
S. Hancock asked if the old beam references have been lost for the beams which were not saved. S. Deghaye replied in the affirmative.

S. Deghaye added that, even if saved in the references, a variation of a GFA done using a knob is not compared to the reference, as in the old system, so it is not recognised as different from the reference.

S. Hancock asked about the status of the Varilog. S. Deghaye replied that few tests were done with G. Metral. There is still a problem with the PTIM-V settings which cannot be written yet with the new passerelle via INCA. S. Hancock commented that these are fundamental settings and the problem should be solved as soon as possible.

S. Gilardoni asked if the problem with the ppm-copy was solved. S. Deghaye replied that a partial solution has been implemented. In order to speed-up the ppm-copy, in INCA different settings were copied in parallel, causing some of them not copied correctly due to a problem of concurrency not correctly handled. Now the ppm copy is done setting by setting.

S. Hancock asked when the problem with the DSC of the BLMs will be solved, since the DSC is tripping more and more often. K. Kostro replied that an upgrade of the system will be done as soon as possible. The system seems to get blocked when too many clients subscribe to the DSC. S. Hancock asked how many clients can subscribe before saturating the DSC. K. Kostro replied that 3 or 4 could be already enough. S. Hancock asked how this is possible since the data the DSC has to treat and transmit are limited to the 100 BLM acquisitions. S. Gilardoni asked why this did not happened in the past.
K. Kostro replied that he will report to the FOM as soon as possible about the DSC upgrade.

EAST AREA (L. GATIGNON):
The users were happy whenever they could receive the beam.

EAST AREA USERS (H. BREUKER):
Nothing to report.

TOF (H. BREUKER):
Everything is fine.

AD (B. DUPUY):
The AD had 32 hours without beam due to the PSB-MPS problem.

In the shadow of this problem, all power converters of the ring AD, were tested.
Two power supplies were found faulty: these power supplies are controlled by GFAs and they have the following problem, respectively: a) the trim DR.DVT1608 provided a current of zero A, despite that few mA were programmed for its function; b) for the trim DR.DVT2904 the negative segments programmed on the function were always executed to zero A. Both power supplies have been changed by First-Line.

In total, six failures have affected the beam:
a) the ring Power supplies DR.QUAD powered off and the problem was solved by the First-Line (downtime of 2 hours);
b) the power supplies in the injection line, after the target AD, DI.BHZ6035 and DI.BHZ6044 acquired currents at zero A, the status was ON and without error. These power supplies are pulsed every 1.2 seconds. Several big capacitors have been changed by Fist-Line. (downtime 3+3 hours);
c) the power supply in the injection line, before the target AD, FTA.DHZ9028 had intermittent fault. This fault had been detected the day before. A bad electronic card

in the power supply was sending a "red button is pushed on magnet" (downtime 1 hour);
d) the security status "Experimental Secure Area" of the chain TARGET-AD. This condition has disappeared from the safety chain in the TARGET-AD.
Therefore, no beam could be injected in the ring AD. This problem was solved by specialist “secure” by a reboot of a PLC (2 hours of downtime);
e) target Station Cooling Fault. The station stopped because of a temperature fault. In Building 195, the interlock of the target temperature was reset, and the pump for cooling the target had to be restarted (downtime 1 hour);
f) one failure of instrumentation did not affect the beam users. All transformers, before the target, in the ring, and in extraction line, have been out of order. A power-supply of a 'NIM' rack equipment was changed by specialist F. Lenardon.

The beam ejected has always been higher than 3.2E7 anti-protons.

AD USERS (H. BREUKER):
ALPHA is running fine.

ATRAP is running fine.

For ASACUSA, the Tokyo group is starting the third run. They received a new positron source that should increase their efficiency.

SPS (K. CORNELIS):
The SPS had a busy week.
The setting up of the cycle LHC2 with the four LHCINV injections has been finished. The longitudinal and transverse blow up could be finalised and the beam was sent to the TED of the TIs. The beam is ready for a faster filling of the LHC.

The LHCINDIV at ultimate intensity has been also used. 2.4E11 p/pulse could be injected on a 26 GeV/c flat cycle. The transverse emittances provided by the PS were however too small. Once the beam was blown-up by inserting a screen in TT10, up to 3E11 p/pulse could be injected.

During the PSB-MPS problem, few interventions of the technical stop were advanced: the RF was repaired, the maintenance of the MPS was done, active filters on QF were changed.

On Thursday afternoon, a vacuum leak appeared in sextant 4. The vacuum was degrading following the machine pulsing. On Friday morning it was decided to stop the CNGS to reduce the number of magnetic cycles, and preserve the machine vacuum until the technical stop. The LHC cycle was used only when needed by the LHC, while the SFTPRO continued to run.
The vacuum leak was found in correspondence of a main magnet that was later exchanged during the technical stop. The technical stop was prolonged to allow the exchange of a second magnet plus.

T. Bohl reported that during the week the electricity in the Faraday cage was suddenly lost due to some not announced interlock tests. This could have caused serious damages to the RF equipments. A procedure should have been put in place for these

tests that, in any case, should take place during the shut-down. S. Deleval reported that the power interruption was caused by a bad manipulation.

H. Vincke asked when the SPS will restart. K. Cornelis replied that this would strongly depend on the vacuum.

North Area (L. GATIGNON):
Whenever the beam was available, the experiments could run without any particular problem.

The only issue to mention is related to the access system of the H2 line. The system will be checked by the expert. A renovation is foreseen for next year.

North Area Users (H. BREUKER):
The users could conclude their data taking even with the reduced time available due to the PSB-MPS problem.

The CMS calorimeter data taking was also perturbed by the mentioned access system problem.

The AMS run will be extended.

CNGS (K. CORNELIS):
The CNGS was stopped on Friday due to the vacuum leak problem in the SPS. There was in any case an access necessary to fix a 48V power supply.

CTF3 (S. BETTONI):
The set-up of the longitudinal space was finished using the segmented dumps in girder 4 and 10 to minimize both the energy spread and the energy variation along the train. The set-up of the RF pulse compression of the klystrons from 11 to 15 to minimize the phase sagitta has been also completed. A quadrupole scan in girder 10 was done and the linac was re-matched as the rest of the machine based on it. A first check of the possible optics error identified from the analysis of the measurements in the delay loop taken last year has been done on Monday. Not a lot of time has been spent in the optimization, because there was the intention to test as quick as possible the new BPM system in the lines downstream the combiner ring. Up to the end of TL2 the system seems to work well; some possible improvements in the software developed by CO has been identified and already discussed. A new system to improve the stability of the klystrons has been put into operation for the first part of the linac and it is working very well.
Concerning CALIFES, a re-alignment of the laser has been necessary after the installation of the protection covers in the laser room. The conditioning of the phase shifter has been completed successfully. From Monday, the beam is going easily up to the end of the line. The charge is presently very small with respect to the nominal one probably due to a problem with the laser. The emittance is also slightly below the nominal one and the energy is about 170 MeV at the end of Califes using also the first cavity on crest.

All the complex was stopped by a problem with the water station on Friday afternoon. The CCC operators are supervising the klystrons during the nights and the week-ends.

LINAC3:
No report.

LEIR (M. CHANEL):
LEIR is starting-up, with a period of cold-check out.
After the repairing of some water leaks, the concerned circuits will be re-opened. This operation will be done pretty slowly to avoid any impact on the other machine operations.

TI (E. LIENARD):
On Sunday night there was a exchange of the SIG water circuit. This caused a momentary reduction of the water pressure in the Meyrin site.

LHC interface with injectors (R. BAILEY):
R. Bailey wanted to thanks the injectors for providing the beam to the LHC even during this difficult week.
The LHC will be in "physics mode" until the end of august. Nominal bunches, in intensity and transverse emittance, are currently colliding. The program foresees the increase of the number of bunches. 12x12 are injected to have 8x8 colliding at each IP. The luminosity is up to 1.5-1.6 10^{30} 1/(cm^2*s).
Currently, the effects of the beam-beam are under study. Every bunch, in fact, has a different tune and orbit due to the beam-beam. The beam stabilisation could be reached thanks to the octupoles, the adjustment of the chromaticity and the use of the transverse damper.

After the technical stop, the restart of the LHC will be done first with a single bunch beam, then with 12x12 bunches. Then the multi-bunch single injection from the SPS will be done.

3. Schedule / Supercycle / MD planning

The current version of the 2010 official schedule (V1.7) is available at:
https://espace.cern.ch/be-dep/BEDepartmentalDocuments/BE/2010-injector-schedule_v1.7.pdf

During the week, the SPS will be in MD until Saturday morning. On Thursday, the UA9 will run for the first time of the year.
On Friday, the SPS will be again in MD but with some interruption due to the LHC filling. The NA will start again on Saturday morning.

K. Cornelis added that a new setting up of the SPS extractions could be necessary after the two magnets exchanged.

All planned interventions for the injector complex are available via the on-line agenda:
https://espace.cern.ch/be-dep/FOM/Lists/Agenda/calendar.aspx.

4. Special topics: Report about the PSB MPS failure.

K. Kahle presented a report about the MPS PSB failure of last week.
The slides can be found here.
The failure of the MPS was due to an earth fault in quadrupole QFO power converter.

Following to this failure: a) a repair of damaged QFO power converter should be done as soon as possible; b) a preliminary verification of electrical insulation to ground was done and several weak points were found. More investigations should be done as a reinforcement of insulation to ground at critical locations.

The switch of the QFO circuit from the spare to the operational should be done by the end of the week. This would cause the stop of the PSB for one hour.

5. AOB

6. Next meeting

The next meeting will be held on Tuesday, 27 July at 10:00 in 874-1-011.

Preliminary Agenda:

1) Follow-up of the last meeting
2) Status of the machines
3) Schedule
4) AOB
5) Next agenda

Minutes edited by S. Gilardoni