Summary of the 1st FOM Meeting

Held on Tuesday 23rd February 2016

Agenda (https://indico.cern.ch/event/496427/)

1. *Next FOM structure*
2. *YETS 2015/16 Linac3 post-mortem*
3. *YETS 2015/16 Linac2 post-mortem*
4. *YETS 2015/16 PSB post-mortem*
5. *PSB HW commissioning status*
6. *Urgent items from machines/facilities*
7. *Schedule and piquet availability*
8. *AOB*

V. Kain chaired the meeting on behalf of **B. Mikulec**.

The list of presence can be found in Annex 0.

1. Next FOM structure

V. Kain presented the new FOM structure (Annex 1).

B. Mikulec will replace **K. Hanke** as chairperson and **V. Kain** will be the Deputy Chairperson.

The weekly report (from Monday to Sunday) of the supervisors should be in form of plot focusing on the machine fault, availability and beam performance (1-2 slides). Each machine/facility should come up with relevant availability observables (table, plot etc.). The ELOG team will provide additional tool to extract automatically the relevant information.

There will be an effort to provide short minutes of the meeting the same day or at latest Wednesday to provide up-to-date information.

D. Küchler commented that, as asked in the past, it would be useful to have the possibility to search in all the minutes of a specific year without opening them one-by-one.

2. YETS 2015/16 Linac3 post-mortem

D. Küchler reported on the activities in Linac3 during the YETS (Annex 2).

The Linac3 YETS was dominated by non-conformities and delays. This produces an overall delay of the February restart of two weeks.

V. Kain and **D. Manglunki** asked about the impact of the delays on the operation. **D. Küchler** explained that at the moment beam is expected to LEIR according to schedule (2nd of May) whilst the delay will directly impact on the Linac3 MD program.

3. YETS 2015/16 Linac2 post-mortem

C. Mastrostefano reported on the activities in Linac2 during the YETS (Annex 3).

Almost all activities of the YETS period were completed as scheduled.

The maintenance of the crane could not be performed but the crane is operational and can be normally used.

Concerning the HW test period, **C. Mastrostefano** reported that due to last-moment-announced electrical cut almost three days were lost.

On Friday at 18h45 a major vacuum leak developed in the Linac2**. J. A. Ferreira Somoza** explained that the pressure of the tanks increased up to 1 mbar. The alarm system reacted as expected and the TE-VSC team intervened promptly. On Friday night it was excluded the possibility of a water leak. Additional pumps were installed since the two turbo-pumps in Tank 1 were found broken. Yesterday (Monday 22nd) the leak was localized in a RF pick-up of the Tank 1.

The broken turbo-pumps cannot be replaced (spare units were ordered last year but are not yet delivered). Operational vacuum condition can be re-establish by using the redundancy of the pumps installed in Tank 2.

V. Kain asked to comment about the expected beam availability. **J. A. Ferreira Somoza** answered that with the present situation the beam is expected in the PSB on the 3rd March (one day of delay with respect to the present schedule).[1]

C. Mastrostefano informed that the transformers of the source are not providing any reading. **D. Küchler** added that most probably the problem is related to a timing issue and **I. Kozsar** has been informed.[2]

D. Küchler acknowledged the BE-RF and TE-VSC teams for their help and support.

4. YETS 2015/16 PSB post-mortem

D. Hay reported on the activities in PSB during the YETS (Annex 4).

Most of the planned activities of the 7 weeks of the YETS could be completed successfully.

The total dosimetry for the PSB at the 10th February was 3.2 man.mSv. The sorting and conditioning of radioactive waste still needs to be improved.

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[1] On the 24th February **J. A. Ferreira Somoza** informed that the good vacuum condition of Linac2 will be re-establish on the 25th February.

[2] At the time of the minutes writing, the timing problem was already fixed but the there is still an issue on the instrument itself or on the signal chain.

The intervention foreseen on the crane could not be carried out (EN-RSO has been informed).

The cleaning activities at the end of the YETS need improvement in the organization, planning and CERN follow-up (SMB-RSO has been informed). **V. Kain** commented this is also the case for the SPS.

D. Hay informed that vacuum leak on the vacuum chamber BR.BHZ151-BE.BSW15L1 was detected. **J. A. Ferreira Somoza** commented that this leak was probably there since 2015. At the moment it has been temporary repaired with the VacSeal. The exchange of the Inconel vacuum pipe is foreseen during EYETS 2016-17 but discussions are still ongoing since the magnet will be anyhow replaced during the LS2. **V. Kain** asked about of the needed intervention time in the case of a leak during the run. **J. A. Ferreira Somoza** explained that if the leak cannot be fixed, the replacement of the chamber is a major intervention (about two weeks stop of the PSB).

5. PSB HW commissioning status

A. Akroh reported about the HW commission status in the PSB (Annex 5).

The PSB DSO test was completed as scheduled on the 3rd February. During the first week of the HW commissioning many accesses were still needed.

It is the first year that BE-OP is responsible in PSB for the HW commissioning period and up to now the activities are progressing smoothly.

The wire scanners and grids dry runs were performed today (24th February).

The HLRF is ready for beam. **M. E. Angoletta** added that the LLRF team will deploy the new version of the firmware during this week. All beams have to be re-commissioned with the new LLRF firmware and any delay on the PSB restart will impact on the already tight schedule.

6. Urgent items from machines/facilities

T. Kramer informed that one thyratron in the PS injector kicker has to be exchanged. **S. Mataguez** commented that tomorrow afternoon (24th March) the PS tunnel can be accessed with a valid IMPACT. **T. Kramer** informed TE-ABT will carry out an intervention also in the SPS (ZS in BA2).

J. A. Ferreira Somoza informed that pressure spikes were observed in the PS 40 MHz cavity in SS78. TE-VSC investigations are ongoing in collaboration with BE-RF team.

7. Schedule and piquet availability

V. Kain presented the Injector Schedule 2016 v1.3 (Annex 7).

The beam in the PSB initially scheduled the 2 March could have some delays due to the Linac2 problem. The beam is expected in the PS on the 8th March.

D. Mcfarlane asked if the April TS is confirmed. **V. Kain** answered positively.

V. Kain informed that the different piquets have been requested starting from the 1st March. TE-ABT, EPC, VSC confirmed it. **S. Montesano** added that EN-STI started the piquets on the 19th February. The TE-MSC and TE-MPE piquets are not yet confirmed.

H. Damerau asked if the 200 MHz piquet will be needed starting from the 1st March. **V. Kain** answered that it has been requested from the 1st March.

8. AOB

V. Kain informed that next FOM will be held on the 1st March 2016.

Next Meeting: Tuesday 1st March 2016.

Minutes reported by G. Sterbini on 24th February

Summary of the 2nd FOM Meeting

Held on Tuesday 1st March 2016

Agenda (https://indico.cern.ch/event/503131/)

1. *Follow-up of the last FOM*
2. *PS YETS report*
3. *PS HW commissioning status*
4. *SPS HW commissioning status*
5. *Update on the Linac2 vacuum issue*
6. *Schedule updates*
7. *AOB*

B. Mikulec chaired the meeting.

The list of presence can be found in Annex 0.

1. Follow-up of the last FOM

The minutes of the last FOM are approved (Annex 1).

2. PS YETS report

S. Mataguez reported on the activities in the PS during the YETS (Annex 2).

A complete list of the activities that took place during the YETS can be found in the PS shutdown eloogbook and a detailed post-mortem summary under Indico. The transport of material longer than 4 m in the PS ring was not possible through the MAD and entailed many alarms from forced PSR doors. A solution has to be found for the next YETS. A first meeting already took place to investigate possible steps to take. The status of the ECRs was also given.

S. Mataguez and **B. Mikulec** acknowledged the different teams involved.

3. PS hardware commissioning status

M. Delrieux reported on the status of the PS hardware commissioning (Annex 3).

Everything is fine so far and on planning. He just noted that 1 DC/DC POPS converter out of 6 was down. POPS can still run like that, but no spare is available until DC1 is repaired. A DVT08 cable was

cut by error; its repair is ongoing. The 24/7 operator shifts started on the 29/02. The PS cold check-out has started and first beam is expected on the 08/03.

R. Wegner asked about the switch-yard beam permit status. **M. Delrieux** answered that it should be signed in the afternoon.

4. SPS hardware commissioning status

J. Ridewood reported on the progress of the SPS hardware commissioning. (Annex 4).

The machine was patrolled and closed on the 19/02. The DSO tests for the LHC extraction channels were moved to the 26/02 to be synchronized with the LHC DSO tests. The main dipoles and quadrupoles are pulsing since the 29/02. There are so far no major concerns or issues and the SPS start-up is on schedule. Beam is expected from the PS on the 14/03.

B. Mikulec asked what beams were needed for the startup. After the meeting, **J. Ridewood** gave the requested information:
For beam based alignment – [SFTPRO (MTE) low intensity – 1e12 - 1e13] & [LHCINDIV – 2e11].
For scrubbing – [LHC25NS up to 48 bunches (1.2e11 per bunch)].

5. Update on the Linac2 vacuum issue

J. Ferreira reported on the vacuum leak that occurred in the Linac2 on 19/02 (Annex 5).

On Friday 19th a leak was detected on the first DTL tank bringing the pressure up to 1 mbar. The big leak rate entailed the failure of fixed pumping groups, so 2 ACP40 pumps were connected to the tank in order to avoid a complete venting keeping the pressure stable at 1 mbar. The leak detection was complicated by the important leak rate (19 mbar.l/s) and the number of positions to test (more than 150). The leak was located on a RF pickup on Monday evening. In order not to vent the tank, it was decided to englobe the pickup in a leak-tight envelope pumped through the tank. This solution was successfully applied on Tuesday evening. Normal vacuum conditions (10e-7 mbar) were restored on Thursday morning.

K. Cornelis asked if the pickup would have to be replaced. **J. Ferreira** answered that it was a spare, so no replacement is foreseen. Moreover, a replacement would mean a complete venting of the tank that is too risky**. M. Lamont** asked about the DTL vacuum pumps status. **J. Ferreira** answered that the pumps seem not to have suffered consequences from the increased load due to the leak.

6. Schedule updates

Given the vacuum issue on the Linac2, **B. Mikulec** said that the first beam to PS might be delayed by 1 or 2 days. **M. Lamont** added that the first beam to the LHC is delayed to Tuesday 29th March.

7. AOB

R. Wegner gave the status of the Linac2. A first 150 mA beam was sent to the Linac dump on Friday 26th February. Interlock and watchdog were successfully tested until the dump. The switchyard beam permit is needed to send the beam to the measurement lines. Alignment tests between source and RFQ will be done on Wednesday 2nd March with the aim to increase the beam current. Beam should be available for the PSB in the afternoon of Thursday 3rd March.

Next Meeting: Tuesday 8st March 2016.

Minutes reported by JB Lallement on 2nd March

Summary of the 3rd FOM Meeting

Held on Tuesday 8th March 2016

Agenda (https://indico.cern.ch/event/505816/)

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

2. YETS 2015/16 SPS post mortem

D. Mcfarlane presented the activities performed in the SPS during the YETS 2015/16. The slides can be found in Annex 1.

All the planned work and ECRs were completed with the exception of the installation of the Cherenkov detector in TT20 (postponed during the 36 h ITS). On top of the scheduled activities, additional ones were carried out (false floor consolidation activities, de-cabling activities, crab-cavities activities, LSS2 ZS2 intervention…).

B. Mikulec asked about the origin of the difference between the number of expected obsolete cables and the cables ready for removal in BA3 and BA5. **D. Mcfarlane** explained that a first estimate of the number of the obsolete cables was done in EN-EL using the available information on their database. During the YETS inspections, it was found that a fraction of the cables was already removed.

D. Mcfarlane mentioned that there is margin for improvement in the activities related to the lighting campaign (replacement of the light tubes) and the cleaning of the tunnel. These issues were common to most of the machines. **B. Mikulec** asked if the lighting campaign was performed by an external company. **D. Mcfarlane** explained that only part of the activities is outsourced.

D. Mcfarlane commented that it is very important that everyone respects the schedule and informs the coordination team about delays as soon as possible.

B. Mikulec acknowledged all people involved in the SPS YETS 2015/16.

3. Status of the machines

Linac 2

R. Wegner presented the Linac2 status (Annex 2). **R. Steerenberg** asked about the gain in current after the realignment of the Linac2 LEBT line. **R. Scrivens** answered that the gain was marginal (0.7 mA).

PSB

B. Mikulec presented the PSB status (Annex 3). The PSB sent the first beam to the PS last night (half-day ahead schedule).

PS

R. Steerenberg reported that the PS HW test and cold check-out period was concluded successfully and acknowledged **M. Delrieux** and **O. Hans** and all other people involved.

Over the weekend the nTOF, LHCINDIV and the MTE cycle were dry run.

PS beam permits and the TT2 beam permit were signed yesterday (7th March) and the SMH16 is still consigned for SPS DSO test until end of today (8th March).

In agreement with RP and BE-RF, last night a low-intensity nTOF and LHCINDIV were injected and accelerated to top energy. The beams were not extracted due to the SMH16 consignation, but the low-intensity beam was dumped on the internal dump. The amount of beam was minimized, but was sufficient to identify issues and debug partly the machine.

At 05h00 this morning all beams were stopped in view of access by the RF team at 08h30. The RF team has to work on two out of the many cavities in the PS that have still issues (13/20 MHZ and the C80-08).

Carlo Rossi gave a brief update and outlook on the RF cavity issues:

- The C13/20 has been pulsing during the night and the repair yesterday was successful. An access is needed today to retune the cavity, which should be completed by tonight.
- The C80-08 cannot reach the full power yet, but this should also be solved by tonight.

V. Kain asked when the first beam would be ready for the SPS injection. **R. Steerenberg** explained that for the moment only low intensities beam was injected due to the unavailability of SMH16. The SPS team requested an MTE with 1e12 ppp (4 turns) and its commissioning will start during the night. Depending on the progress, by Thursday it will possible to know if SPS can have beam before the weekend.

Reports from other machines

K. Cornelis informed that on Thursday 2nd March an important leak developed in TT2 and TT10. **J. Ferreira Lozano** explained that the vacuum leak closed by itself without any intervention. It is a behavior observed often for leaks that are due to material corrosion. Despite prompt and extensive leak detection attempts, the leak disappeared before being localized.

H. Wilkens asked about the problem of the magnet in the East Area. **R. Steerenberg** explained that a magnet in ZT9 developed a water leak. There is not working spare available. The only available spare was not repaired since it is radioactive. To open and close the roof 3-4 working days are expected. The issue will be reported to IEFC on Friday 11th March. RP is investigating a dose plan for the repair and more information will be available next week. **R. Steerenberg** observed that this episode demonstrated the need of the consolidation of the East Area.

IT

Before the meeting, **J. Nielsen** informed by email that there was nothing relevant to mention.

4. Schedule Updates

B. Mikulec presented the Injector Schedule 2016 v1.3 (Annex 4). Today (8th March) the SPS DSO will be performed. LHC official injection will be on Monday 28th March, but LHC beams have to be ready in the Injector Complex by Thursday 24th March.

5. AOB

There were no AOB.

Next Meeting: Tuesday 15th March 2016.

Minutes reported by G. Sterbini on 9th March

Summary of the 4th FOM Meeting

Held on Tuesday 15th March 2016

Agenda (https://indico.cern.ch/event/507925/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Linac2 intervention and source status*
4. *Follow-up of the EA T9 magnet issue*
5. *Schedule updates*
6. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

2. Status of the machines

Linac2

R. Scrivens presented the Linac2 status (Annex 1). The beam current from the proton source suddenly dropped on Thursday afternoon after a source flashover. Investigations are ongoing. More details in §3.

PSB

E. Benedetto presented the PSB status (Annex 2). Beam availability was dominated by the Linac2 source intervention. Low intensity MTE and TOF, LHCINDIV, high intensity TOF and LHCPROBE beams were already sent to the PS and SPS.
Issue to follow-up: From shot to shot, beam is not ejected to the PS. The timing BEX.W10SYNCPS is not generated. Investigations are ongoing.

PS

R. Steerenberg reported on the PS status. The issues with the 13/20 MHz and C80-08 cavities were solved by Thursday morning. Thanks to all parties involved to complete this work, but also for making the arrangements possible to set up beam during nights and have access for the repairs during daytime. However, this also meant that the RF (low level) team that needs to check beam settings, adjust the 200 MHz cavity phasing and commission some new hardware for the LHC control has not seen much beam yet, as it was only available during night time. The LINAC2 source problem reduced further this availability.
Beams presently available:

- LHCINDIV with more or less correct characteristics.
- Low intensity MTE with 4 turns extracted to SPS as requested.
- LHCPROBE being set up.
- TOF with 5.5E12.

The priorities for the coming days are:

1. Setting up of the LHCINDIV and LHCPROBE beams, as these are the first beams requested by the LHC. Monday 21st, the LHC would like to send the LHCPROBE and/or LHCINDIV beam down the TI2 and TI8 lines. They foresee to inject as of Thursday 24/03 or Friday 25/03.
2. Phasing of the 200 MHz system (try to complete by Tuesday afternoon, provided beam available).
3. SFTPRO with MTE at ~2E13 ppb (in steps with the SPS).
4. LHC 25 ns beam, as RF needs to test new HW to allow for very low intensities (in view of the P-Pb run) these changes can have important impact on delays.
5. Set up dedicated nTOF beam up to 8E12 ppb.
6. Start setting up of the LHC 25 ns beam.
7. Start setting up of the AD beam (should be straightforward, as no RF modifications).

D.Manglunki noted the ion stripper in TT2 sent a signal compatible with "neither in nor out", and it did not seem to move in spite of the correct timings being sent. **R. Steerenberg** replied this issue would be addressed.

SPS

D. Manglunki presented the SPS status (Annex 3). The first beam circulated on Saturday evening and the 400 GeV flat top was reached on Sunday morning. Two “sabers” were forgotten in dipoles 40930 and 51330 and generated high losses. They were found and removed on Monday.
D. Manglunki and **V. Kain** insisted on the fact that this should never happen again. **J. Ferreira** answered that he would follow this up and make the changes such that the vacuum line could not be closed with these tools inside.

An action was opened for J. Ferreira.

V. Kain added that the priority for the SPS is now to set up the LHC 25 ns beam for HiRadMat.

LHC Interface with Injectors

M. Lamont said the LHC would ask for LHCPROBE beam during week 12. The LHC 25 ns beam would only be requested a few weeks later.

3. Linac2 intervention and source status

R. Scrivens presented a detailed report on the source intensity issue investigations (Annex 4). The beam intensity from the source clearly declined from the 03/03. This current drop was amplified on the 10/03 after a source flashover. All tests made up to now, including parameter scans, leak detections, verifications of connections, isolation, resistances, exchanges of supplies, cathode, extraction electrodes, PEC and gas line ceramic were inconclusive. A similar problem was never seen in the past. At the time of the meeting, the reason for the source intensity drop by 30% was unknown. More tests would take place in the next days and the source team would prepare for a full source parts exchange. As mitigation, the arc current could be increased to recover more intensity with the risk of shortening the cathode life-time.

After the meeting, it was decided to temporarily increase the arc current to stabilize the beam current delivered to the PSB to around 100 mA.

4. Follow-up of the EA T9 magnet issue (+TCC2 magnet issues)

L. Gatignon presented the status of the ZT9.QDE1 and TCC2 magnet issues (Annex 5).
Details on the ZT9.QDE1 magnet were presented at the IEFC meeting on 11/03. In case the repaired and certified magnet is delivered on the 31/03, installation, alignment and connection could take place on 01/04. The East Area would be ready for beam on the 08/04 and DSO tests, initially planned on the 29/03, could be planned on the 06/04 or 07/04.
On the 10/03, two leaks were found in QNR.061.005 and QNL.061.009 after the cooling circuit was switched on. The repair was planned for the 16/03 with no impact on the schedule. The leak could have been caused by a pressure surge. **V. Kain** asked **S. Deleval** to review the procedure for switching on the cooling circuit. **S. Deleval** said that there could have been air in the circuit and that he would check if everything went according to their restart procedure.

After the meeting, we received the following information from **S. Deleval:**
"We analyzed the start-up phase of the cooling circuit of the BA80 and didn't noticed any non-conformities. The three pumps started one by one and the automatic valve opened normally during the sequence. The pressure and the flow increased slowly. The circuit has started as it always did. There were no pressure surge. As already said at the FOM, we cannot exclude small pockets of air remaining which could produce strong vibrations."

5. Schedule updates

B. Mikulec presented the Injector Schedule 2016 v1.3 (Annex 6).

D. Manglunki asked about the possibility of starting the ions in the PS & SPS 6 weeks earlier, i.e. July 18th and August 1st, respectively. **M. Lamont** replied the request was noted but that the decision had not been taken yet.

6. AOB

F. Pirotte sent by email the planning of the upcoming DSO tests:

Prochains tests DSOs prévus avec coupure de faisceau des zones amont:
22/03, 14h-17h : LEIR -> Impact sur le SW et Linac 3
23/03, 9h-12h: Isolde Target-> Impact sur le BOOSTER
29/03, 14h-17h: East Area- zone primaire + CHARM+IRRAD-> Impact sur le PS-Ring (***will have to be postponed given* §4**)
30/03, 9h-12h: AD target + AD Ring-> Impact sur TT2
31/03, 9h-12h: nTOF -> Impact sur TT2

Next Meeting: Tuesday 22nd March 2016.

Minutes reported by JB. Lallement on 16th March

Summary of the 5th FOM Meeting

Held on Tuesday 22nd March 2016

Agenda (https://indico.cern.ch/event/509887/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *AD YETS report - current status*
4. *Schedule Updates*
5. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

2. Status of the machines

Linac 2

JB. Lallement presented the Linac2 status (Annex 1). Few beam stops took place over the week for source issue investigations. A small vacuum leak was found and fixed on the tombak valve. Since then, the source intensity is constantly increasing. It should be visible in the coming days if the situation still improves and if one could come back to source nominal settings. In case the source performance would degrade again, the source team could be ready for a complete source exchange from the 29/03.

R. Scrivens gave more details on the source vacuum leak findings (Annex 2). Source Arc is still high, but intensity of last year has been reached. A change of the source would not help at the moment.

PSB

G. Di Giovanni presented the PSB weekly report (Annex 3). Thanks to **S. Pasinelli**, it is now possible to access and extract the statistics and pie-charts for each machine directly from the elogbook, http://elogbook.cern.ch/, on the GPN or TN.
The status of the beams is the following:
MTE Low Intensity, LHCINDIV, LHCPROBE are within the specifications. Maximum intensity for TOF is 700E10 ppp. Work is ongoing for LHC25 and NORMGPS. The list of open issues was given.

PS

R. Steerenberg reported on the PS status (Annex 4). The beams available to SPS are LHCPROBE, LHCINDIV and MTE with 1, 4 and 5 turns. The setting up is ongoing for LHC25ns, TOF and high intensity MTE (requires to align SMH16 which was replaced during the YETS). PSB-PS energy matching was done and new reference magnetic fields were found. **S. Hancock** added that some more work would be needed on this subject to adjust the energy of all rings from the PSB correctly.

SPS

H. Bartosik reported on the SPS status (Annex 5). The week was devoted to the setup of the LHCPILOT, SFTPRO2 (with low intensity MTE beam) and AWAKE cycles, as well as the "beam based alignment", i.e. the closed orbit correction at high energy by quadrupole displacements. By displacing 3 focusing and 5 defocusing quadrupoles, sufficient orbit correction at top energy (rms of about 2 mm) could be achieved for the fixed target beams and at the same time for the LHC beams with the Q20 optics. The LHCPILOT beam was successfully extracted to the TT40 and TT60 TEDs on Friday. Beam 1 is lost at the beginning of TI2. Investigations were ongoing. The QF ripple issue is not solved yet.

V. Kain asked EPC if they could continue to follow up the QF ripple issue. **C. Mugnier** answered that they had hoped that the thyristor modifications had solved the problem, but it seems this wasn't the case.

An action was opened for EPC/C. Mugnier.

CTF3

F. Tecker reported on the CTF3 status (Annex 6). The list of solved issues was given. The dogleg run was cancelled over the weekend due to a problem with the 12 GHz klystron modulator.

LHC Interface with Injectors

M. Lamont said that the LHC check-out was in progress. The vacuum would be ready on the 24/03 after the CMS closure. The first beam would be taken on Friday/Saturday (25-26/03).

Reports from other machines

D. Manglunki said that the LEIR DSO test would take place in the afternoon (22/03). He also added that whenever the Master General Timing is restarted, it should be checked if Linac3 and LEIR are in stand-alone mode or not, in order not to perturb their operation, as it was the case the previous week.

3. AD YETS report – Current status

T. Eriksson reported on the activities that took place in AD during the YETS (Annex 7). Among many other activities, the LNI (injection line from the AD ring to ELENA) was installed. The BCCC installation

is delayed by 1 week and will impact the start-up schedule. The setting up with beam is now planned to start on the 14/04 (04/04 initially) and the Physics start will probably be delayed by 2 or 3 weeks.

B. Mikulec and **V. Kain** said that possible schedule modifications should be discussed later once some update on the outstanding interventions will be available.

J. Ferreira added that the vacuum leak on C10 cavity was repaired.

4. Schedule Updates

B. Mikulec presented the Injector Schedule 2016 v1.3 (Annex 8).

X. Genillon said that the spare parts for the DC/DC POPS converter which failed few weeks ago were received. More than 8 hours would be needed to proceed to the replacement including tests, and the next technical stop would not be long enough. **M. Lamont** said that the 13/04 technical stop cannot easily be extended. **R. Steerenberg** said that the work could de started during the next TS and be completed during a later stop to be defined.

An action was opened for M. Lamont to define the most suitable time window.

5. AOB

There were no AOB.

Next Meeting: Tuesday 29th March 2016.

Minutes reported by JB.Lallement on 23rd March

Summary of the 6th FOM Meeting

Held on Tuesday 29th March 2016

Agenda (https://indico.cern.ch/event/513146/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *ISOLDE YETS report - current status*
4. *Technical Stop: List of activities*
5. *Schedule Updates*
6. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

There are three open actions (Annex 1).

1. Concerning the presence of the sabers in the SPS, **P. Demarest** informed that new tools are under study to avoid the same problem in the future. The action stays open.
2. Concerning the SPS QF ripple, **C. Mugnier** informed that **K. Kahle** and **O. Michels** are investigating the issue. The action stays open.
3. Concerning the scheduling for the 8 h stop requested for a POPS intervention after the ITS1, **M. Lamont** informed that the request will be considered, but the scheduling needs to stay flexible. The action stays open.

2. Status of the machines

Linac2

M. O'Neil presented the Linac2 status (Annex 3). The availability of the machine was very good with only two faults. The provided current is around 140 mA. **B. Mikulec** asked if interventions that were undone during the source problem investigation were expected to be reverted soon. **M. O'Neil** answered that no intervention was scheduled at the moment. The alignment of the solenoids was undone during the interventions to re-establish the initial conditions. Discussions are ongoing on the possibility to perform the realignment during the ITS1.

PSB

B. Mikulec reported the PSB status (Annex 4) of behalf of **K. Hanke**.

There were no major faults during the week. The main reasons of the downtime were the unavailability of Linac2, the DSO test for ISOLDE and tests on the MPS.

Some problems with the transverse feedback required intervention of the specialist, and will require more work during this week. Further to the beams already prepared and sent to the downstream machines, work focused on setting up the MTE beam at nominal intensity, the EAST beams as well as the AD beam.

LHCPROBE was delivered to the LHC on Friday morning.

S. Hancock asked about the present intensity of the AD beam. **B. Mikulec** answered that AD is available with nominal intensity.

PS

G. Sterbini reported the PS status (Annex 5).

The availability of the machine was 90% with issues on the cavities (C40, C80 and C200 and C10). To repair the C80-89 an access in the ring was needed (3h 30 min downtime). In addition to that, the septum 16 power converter had to be reset several times (~3 times/day) all along the week. Part of the problem was due to communication issues with the control card (EPC piquet was called whenever the fault was not resettable) and due to the poor vacuum level when particles intercept the septum blade (the converter trips when the 1e-6 mbar level is reached). The experts are informed and the issue is going to be monitored in the following days.

The MTE intensity is above 1500 ppp and the septum 16 shadowing (after its replacement during the YETS15/16) was re-established. After the repositioning of the septum 16, the extraction of the LHC beams and of TOF was optimized. TOF is running above 700 ppp. During the weekend AD and EAST commissioning started (EAST+TOF was injected and AD was accelerated at top energy with reduced intensity, ~400 ppp).

M. Hourican commented about the septum 16 observing that PS-OP should minimize the radiation level on the device and informed that a spare is being prepared. Once the spare will be ready and if needed, a replacement of the septum 16 would take about 6 days. **B. Mikulec** asked when the spare would be available. **M. Hourican** answered that it will available at the end of the week.

C. Mugnier informed that the TE-EPC piquet replaced twice the control card of the septum 16 and that **J. M. Cravero** will continue the investigations.

SPS

K. Cornelis reported about the status of the SPS machine (Annex 6). The main downtime was connected to a problem with the cooling water circuit trip, the EPC-related faults, the MKE4 spikes and the PS unavailability.

SPS continued setting up the beams for the LHC and the fixed target. The slow extraction of the fixed target beam was commissioned with a low-intensity beam.

The LHC pilot transfer to the last TED started at the beginning of the week. Issues were encountered to get the beam past the first set of dipoles in TT60 after the TED. The problem turned out to be a wrong calibration (on RBI6104). The DAC calibration, as well as the DCCT and Fast Extraction Interlock DCCT seemed to be equally wrong so that the current error could only be detected in the tunnel with a current measurement clam. Once this calibration error was solved, beam could be sent down to the last TED and the pilot beam was successfully used during the Easter weekend for LHC commissioning.

The 25 ns beam was ready by Thursday and was used during the weekend for scrubbing. Initially there was an intense vacuum activity in the regions where magnets were changed and also on MKE4, even with only 12 bunches. By the end of the weekend, 4 nominal batches could be injected without any interlocks.

K. Cornelis informed that an access is going to be organized for an intervention on LSS2 (aperture checks and re-alignment). The access will take place most probably tomorrow morning (30th March). **B. Mikulec** asked **K. Cornelis** to inform the machines supervisors once the exact time will be defined.

B. Mikulec asked about the follow-up of the DCCT problem. **K. Cornelis** informed that **V. Kain** would call for a meeting with **Q. King**. An action was opened.

S. Deleval commented that the perturbations of the BA3 and BA6 chilled water supply was due to several modifications performed on the station (and a related SW bug) and to a problem of an alarm transmission. A pressure switch has to be changed. **B. Mikulec** suggested scheduling this intervention in the shadow of the LSS2 access (30th March).

CTF3

L. Malina presented the CTF3 weekly report (Annex 7).

LHC

M. Lamont informed that the first LHC beam was injected and captured on Friday morning. During the weekend it was captured, accelerated and squeezed. **S. Hancock** asked about the requested bunch intensity for the coming days. **M. Lamont** answered that for the moment only LHCINDIV with nominal intensity (1.1e11 ppb) will be taken.

TI

J. Nielsen informed that in addition to the already mentioned problem with the water stations in BA3 and BA6, there was an emergency stop in the North Area (problem with a switch). There was no impact for the operation since no beam was sent to the North Area.

3. ISOLDE YETS report - current status

M. L. Lozano presented the ISOLDE YETS report (Annex 8).

The cold checkout was perturbed by several interventions and delays of YETS activities.

B. Mikulec asked why so many interventions still took place during the cold checkout phase. **M. L. Lozano** explained that they were partly unplanned, unexpected or delayed interventions. **B. Mikulec** asked about the improvements that could be envisaged in the future. **M. L. Lozano** suggested that hardware specialists should be more involved in the hardware commissioning. **B. Mikulec** observed that this is indeed crucial and that the re-commissioning team should take the initiative to involve the specialists since the beginning.

M. Gourber-Pace observed that the control system was requested to be available from the 22 February, which is very early with respect to the physics start mid of April. This was quite a challenge for the group. **E. Fadakis** commented that the main services required were the timing and OASIS. During the restart there were problems on those services. **M. Gourber-Pace** commented that the short list of issues, as BE-CO is concerned, could be considered as 'normal' during the commissioning period. **M. Gourber-Pace** strongly supported **B. Mikulec** proposal to have the OP machine re-commissioner driving the commissioning program. A detailed planning with the systems to be validated should be communicated to the equipment group specialists to ensure their readiness. Discussing with the ISOLDE OP team, **M. Gourber-Pace** and **F. Locci** realized that a training on controls would be beneficial and **F. Locci** organized a first training for the ISOLDE operation team on 6th of April. **B. Mikulec** and **M. L. Lozano** acknowledged this initiative. **M. Gourber-Pace** announced that she setup a meeting for the following day (30th of March) with **F. Locci**, **R. Catherall** and **E. Fadakis** to review the situation.

4. Technical Stop: List of activities

D. Mataguez presented the list of the IMPACT requests received so far (Annex 9). For the PSB and PS there are mainly inspections. **D. Mataguez** observed that for the LEIR injection line (PS switchyard) a replacement of a SEM grid and of a BCT is foreseen.

D. McFarlane informed that he received 20 IMPACTs for the SPS, mainly inspections and lift maintenance interventions.

B. Mikulec reminded everybody to submit as soon as possible the IMPACT requests since they have to be validated by the facility coordinators and RP.

5. Schedule Updates

B. Mikulec presented the Injector Schedule 2016 v1.3 (Annex 10). Next Monday the Meyrin Complex users will start to take beam (ISOLDE, NTOF) and NA and EA setup will start. The ITS1 will take place on the 13th April.

B. Lefort informed that the AD restart would be delayed to the 16th April due to the problems and delays for the installation of the cryo-module of the high-sensitive BCT. AD-OP is using each time slot for taking measurements to absorb as much as possible this delay. **B. Lefort** observed that the holiday period is not helping to keep the schedule.

6. AOB

J. Axensalva asked for an installation of Ethernet cables for the LEIR Control Room. An access to the false-floor is needed (Annex 11). After discussion and the approval from the Linac2 supervisor, the FOM endorsed the request.

F. Pirotte informed about the next DSO tests.

- 31.03.16, 9h-12h: nTOF. It will impact on TT2 (~20 min downtime expected)
- 01.04.16: 14h-17h: ADT+ADR. It will impact on TT2 (~20 min downtime expected)
- 05 and 06.04.16: 9h-17h: North Area (EHN1-EHN2-ECN3). It will impact on the SPS.
- 07.04.16: 14h-17h: East Area (primary zone, CHARM and IRRAD). It will impact on the PS.

Next Meeting: Tuesday 5th April 2016.

Minutes reported by G. Sterbini on 30th March

Summary of the 7th FOM Meeting

Held on Tuesday 5th April 2016

Agenda (https://indico.cern.ch/event/515172/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Technical Stop: List of activities*
4. *Schedule Updates*
5. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

There are four open actions (Annex 1).

1. Concerning the presence of the sabers in the SPS. The action stays open.
2. Concerning the SPS QF ripple. Equipment monitoring is ongoing. The action stays open.
3. Concerning the scheduling for the 8 h stop requested for a POPS intervention after the ITS1. The action stays open.
4. Concerning the DCCT issue. **V. Kain** said that a meeting would take place in the afternoon with **Q. King**. The action stays open.

2. Status of the machines

Linac2

D. Kuchler presented the Linac2 status (Annex 2). The source parameters are progressively returned towards nominal operational values in order to preserve the cathode lifetime while the source intensity is still improving. The source and LEBT will be realigned during the next technical stop (should result in a gain of a few mA out of the RFQ).

PSB

B. Mikulec reported the PSB status (Annex 3). Very good week. ISOLDE beam permit was released on Monday.

PS

M. Fraser reported the PS status (Annex 4). Beam setting-up is ongoing for AD (~1000 ppp) and EAST + parasitic TOF (TOF bunch extracted at ~300 ppp, EAST extraction still to be set up). A better behavior of the SMH16 was observed. Its aperture scan during the SPS stop on the 30/3 did not show any problem. Final energy matching is not completed with all booster rings. RF experts are following this up.
D. Macina added that nTOF would be ready to receive beam from the PS, as soon as its cooling station issue is solved and the beam permit signed.

SPS

H. Bartosik reported about the status of the SPS machine (Annex 5). Setting up is ongoing for the LLRF and scrubbing with the 25 ns beams. The 25 ns beam for HiRadMat will be ready in the coming days. The main downtime was due to the repair of the mini scan in LSS2 (26 hours) and a WIC problem in TI2.

AD

B. Lefort presented the AD weekly report (Annex 6). The DSO tests were successfully passed. Bake-out is ongoing in the AD ring until the 13/04, when tests with beam could start.

B. Mikulec asked whether the AD physics could start as scheduled on the 25/04. **B. Lefort** answered that it is always difficult to know what time would be needed to set up the machine. The 25/04 is an optimistic date, and it cannot yet be excluded that the physics start could also be delayed by 1 or 2 weeks.

East Area

L. Gatignon informed that the DSO tests are scheduled on Thursday afternoon. The first beam is expected over the week-end.

TI

J. Nielsen sent an email before the meeting.

For TI, the last week we had:
Sat 02/04 03:37: Trip of the SPS, caused by a low flow on power converter in BA4. High temperatures detected at the same time on the chilled water production. See Major Event
Sun 03/04 22:38: I0 (Short circuit detection) tripped 3,3kV breaker EMD105 and thus the CRYO for ISOLDE. In agreement with EN-EL and ISOLDE the breaker was left like this for Monday morning. See Minor Event.

On Mon 04/04, we did the note de coupure:
https://edms.cern.ch/ui/file/1607385/1/ENNC_EL_2016_099.pdf where EN-EL needed to do an intervention in the substation 16 in Meyrin, powering CTF3 and buildings around. Indeed the breaker had tripped and was getting warm. No problems seen so far.

3. Technical Stop: List of activities

C. Mastrostefano presented the list of the IMPACTs for Linac2 and Linac3 (Annex 7, Annex 8). On Linac2, he noted that the source and the LEBT would be realigned and the hydrogen bottle would be changed.
L. Soby commented that the Linac3 ITH BCT41 would not be re-installed as there is a vacuum leak on the ceramic.

D. Hay presented the list of the IMPACTs for the PSB (Annex 9). He said that in order to replace the 4 damaged cables between BCER rack 370 and BT2.SMV20, the false floor should be removed and the equipment around should be locked out. This has been agreed with OP. He also noted that the EPC group requested to pulse the corrector and quadrupole magnets in the LT, LTB and BI lines during the technical stop from 14:00. **C. Mastrostefano**, **D. Hay** and **S. Mataguez** confirmed that an email would be sent out to the coordination mailing list in order to inform the teams that will work in the area.

S. Mataguez presented the list of the IMPACTs for the PS (Annex 10).

D. Mcfarlane presented the list of the IMPACTs for the SPS (Annex 11).

H. Vincke gave the beam stop and access timing for the technical stop:
Beam extraction to NA will be stopped at 4:00.
All beams shall be stopped at 4:30.
General access in the PS complex from 8:30
Access start in the SPS from 8:30 (except LSS2-LSS1)
Access start in LSS2 and LSS1 from 13:30.

S. Pasinelli asked if the central timing could be restarted during the technical stop. **M. Gourber-Pace** answered that it should be discussed at the LMC, as the technical stop does not concern the LHC. The LHC would be kept running during the technical stop.

4. Schedule Updates

B. Mikulec presented the Injector Schedule 2016 v1.3 (Annex 12).

5. AOB

There were no AOB.

Next Meeting: Tuesday 12th April 2016.

Minutes reported by JB. Lallement on 6th April

Summary of the 8th FOM Meeting

Held on Tuesday 12th April 2016

Agenda (https://indico.cern.ch/event/517480/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

There are four open actions (Annex 1).

1. Concerning the issue with the sabers in the SPS, **J. A. Ferreira Somoza** informed that a mechanical solution has been implemented. In the future will not be possible to accidentally leave the "sabers" inside the vacuum chamber. The action was closed.
2. Concerning the SPS QF ripple, **C. Mugnier** informed that investigations are ongoing. One of the main difficulties is to trigger the acquisition system on the correct event. All relevant signals are being monitored to understand the origin of the problem. The action stays open.
3. Concerning the problem in the RBI6104 DCCT calibration of the SPS-LHC transfer line, **V. Kain** informed that a redundant DCCT would be installed. **C Mugnier** added that future interventions on such Fast Current Interlocks would follow the same procedure of the interventions on EIS devices. **B. Mikulec** asked to present one slide in one of the next meetings summarizing the adopted solution before closing the action. The action stays open.
4. Concerning the scheduling for the POPS intervention after the ITS1, **B. Mikulec** informed that for the moment the TE-EPC team requested only 2 additional hours (initially 8 h were requested in addition to the 8 h of TS1). Tomorrow (13th April) a first intervention will be done during the TS. After the TS, POPS will be re-started in degraded mode. The results of the intervention will be analyzed and eventually an additional 2 h slot will be requested to swap between degraded mode and nominal operational mode. The action was closed.

2. Status of the machines

Linac2

M. O'Neil presented the Linac2 status (Annex 3). The availability of the Linac was almost 100%. The source intensity slightly increased during the last week (up to 150 mA on BCT20). All source parameters are nominal except for the arc current, which is still slightly high.

PSB

G. P. Di Giovanni reported on the PSB status (Annex 4). The availability of the machine was excellent. The major fault was due to problem on the extraction kickers (50 min downtime). The week was mainly devoted to the beam commissioning of the ISOLDE transfer line.

ISOLDE

E. Siesling reported that it was a hectic week for ISOLDE.

As part of the yearly setting up of the BTY line to HRS and GPS the SEM grid tests were performed and completed ahead of time on Wednesday afternoon. The PSB team was acknowledged for the support.

HRS: **J. Schipper** and **T. Gharsa** carried out the tests on the HT of the new High Voltage modulator. The tests needed to be performed inside the ISOLDE HT room. To have people in the ISOLDE HT room, which is part of the ISOLDE safety chain, special safety measures were taken. The tests were very successful. It was demonstrated that the new modulator circuit is capable of re-establishing the HV with improved recovery time and, therefore, more data can be collected for many short-lived isotopes. The HRS proton run will start this week.

GPS: Collections for nTOF of ^{7}Be were foreseen last week and during the weekend, however, the target was not performing as expected (yield factor 50 lower). By using the telescope from RILIS it was observed that the target line is not at its nominal temperature. No obvious reasons were found.

The new ISOLDE control room is now operational. It is a major improvement to the comfort of operating the facility.

ISOLDE Users

K. Johnston reported that the collections of ^{7}Be were not possible over the weekend. A collection was performed last night. Even though it was 50 times less than initially foreseen (20 MBq instead of 1 GBq) the nTOF team was satisfied with the partial result.

PS

A. Guerrero reported that the machine had a very good availability (Annex 5). All PS beam permits are now signed and beam was provided to all experimental areas (TOF, EAST, AD) for setting up.

M. Gourber-Pace asked more details on the PSB extraction synchronization problem. **S. Hancock** reported that a phase jitter of 20 degrees (with respect to the PS bucket frequency) was observed for

the R1 and R4. This can produce transverse losses at injection and/or longitudinal losses along the cycle. Moreover this jitter prevents the possibility to do a precise energy matching between the two machines.

East Area Users

B. Rae informed that the DSO test was performed last week and beam was received on Friday. The EA Physics Program will start on the 25th April.

nToF Users

F. Gunsing reported that nToF data acquisition started on the 5th April (before the official date).

The 20 MBq ^{7}Be sample has been moved to the storage room of EAR2 and will be installed during Wednesday (14 April) morning.

AD

T. Eriksson reported that the AD ring is still in HW test mode. This takes place in parallel with the vacuum bake-out of 2 ring sectors. The BCCC has been installed and a leak on the C10 cavities has been repaired.

For the target area, beam was sent all the way to the end of the dog-leg and basic checks of target/horn functionality have been carried out.

The removal of the bake-out equipment will start tomorrow (13th April).

The ring should be ready for beam on the 15th April and the setting-up time has to be completed in 10 days in parallel with beam commissioning.

AD Users

There was nothing to mention.

SPS

V. Kain reported that the SPS had 92% availability (Annex 6). The downtime was dominated by the TE-EPC investigation on the quadrupole jitter. The HiRadMat test was successful (288 bunches with >1.2e11 ppb).

A vertical aperture restriction in ZS was measured. An intervention is planned during the TS1 and it will imply 24 h vacuum recovery and ZS conditioning from Friday or Saturday. NA setting up can start only from the 18th of April.

There was a failure on the LHC injection interlock system (a nominal beam was accidentally injected into the LHC). For the moment LHC multi-bunch injection tests have been suspended.

M. Giovannozzi asked if the LHC multibunch injection could take place during this afternoon (12th April). **V. Kain** explained that the experts were working to solve the issue with the interlock system and a fix should be available in the afternoon. If successful, the LHC multibunch injection could take place.

North Area

B. Rae informed that there were no major issues to report.

LHC

M. Giovannozzi informed that the beam commissioning is progressing as expected.

CTF3

There was no report.

TI

J. Nielsen informed before the meeting that the main problem of the week was an electric perturbation during the weekend.

3. Schedule Updates

B. Mikulec presented the Injector Schedule 2016 v1.4 (Annex 7). The ITS1 will take place tomorrow 13th April from 8h00 to 16h00. **B. Mikulec** clarified that at 16h00 all interventions should be finished and the machines restarted (except the SPS that will have to recover the vacuum condition).

All beams shall be stopped at 04h30. General access in the PS complex will start from 08h30. Access in the SPS will start from 08h30 (except LSS2-LSS1 access that will start at 13h30).

Following the modification on the LHC TS3 schedule, the Injector TS3 has been moved from Week 35 to Week 37. This also means that the COLDEX run was delayed by the same 2 weeks.

4. AOB

There were no AOBs.

Next Meeting: Tuesday 19th April 2016.

Minutes reported by G. Sterbini on 13th April

Summary of the 9th FOM Meeting

Held on Tuesday 19th April 2016

Agenda (https://indico.cern.ch/event/520803/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

There are two open actions (Annex 1).

1. Concerning the SPS QF ripple, **C. Mugnier** informed that investigations are ongoing. All relevant signals are being monitored to understand the origin of the problem. Few events were observed and the investigation activities are continuing. The action stays open.
2. Concerning the problem in the RBI6104 DCCT of the SPS-LHC transfer line, **C. Mugnier** presented the status and the taken actions (Annex 2). The problem with the RBI6104 DCCT was recalled. During the YETS the two RBI6104 DCCTs were replaced, but the current/voltage conversion factor was not updated in the database. During the LHC injection test, even if the system seemed to work properly, the pilot beam was lost in the line. The detection of the fault was time-consuming. The consequence of the accident could have been much worse. **K. Cornelis** commented that a similar problem could impact directly on the LHC safety and not only the one of the SPS complex. **C. Mugnier** and **V. Kain** explained the actions and procedures put in place to avoid a similar problem in future for this specific case. The action was closed.
   K. Cornelis commented that presently the current diagnostics on the different circuits uses the DCCT of the current regulation loop. This approach is not robust in the case of problems on the regulation itself. It the DCCT is faulty for a quadrupole power supply, beam-based detection of the problem could take a very long time, and so a redundant system should be implemented across all machines. **B. Mikulec** agreed that this issue should be followed up. An action was opened.

2. Status of the machines

Linac2

M. O'Neil presented the Linac2 status (Annex 3). The availability of the machine was very high with only one fault (QRF, 41 min downtime). During the TS1 the first solenoid was realigned and the H bottle refilled. Linac2 is providing 150 mA at LT.BCT20.

PSB

A. Findlay presented the PSB status (Annex 4). The availability of the machine was 98%.

The recovery from the TS1 was slightly longer than expected, but all beams were back by 19h00 on Wednesday.

A MD on the C16 blow-up reproducibly resulted in the confirmation that the C16 phase was not always locked to the C02. A reset was enabled that allowed a fix for the longitudinally shaved beams (LHCINDIV and LHCPROBE). Investigations are ongoing to confirm the improvement of the performance.

Work continued to understand the source of the slight jitter at synchronization for R1 and R4, but this has not yet been understood.

R1 has lower maximum intensity than the other rings, but after the work of **G. P. Di Giovanni**, its intensity matched the intensity of R3. This setting will be propagated to the high intensity operational users.

ISOLDE

E. Fadakis presented the ISOLDE status (Annex 5). The availability of the machine was very high (>99%).

The delivery of beam was discontinued a few times to optimize the laser settings (only non-scheduled interventions are considered for the availability computation).

GPS was not running during the week. An intervention on the GPS Front-End took place on Monday 18th April.

ISOLDE Users

K. Johnston informed that the users were satisfied with the beam conditions. **B. Mikulec** asked if delays are expected for the GPS run. **E. Fadakis** and **K. Johnston** answered that for the moment the schedule is confirmed.

PS

G. Sterbini reported the PS status (Annex 6). The availability of the machine was 92%. The downtime was dominated by

- An access for a fault in the C80 just before the TS1 (needed to deliver beam to the LHC).
- Patrols needed after the LS1, a problem with the converter of the SMH42 and hiccups with the LLRF during the machine restart
- An RTI problem on the TOF switching magnet (FTN.BHZ403, affecting only nToF)
- An access for a water circuit problem in SMH57, C80 and Dump 48.

The major activities of the TS1 involved the replacement of the faulty DC/DC converter for POPS.

B. Mikulec informed that the problem with the systematic loss of patrols during the TS intervention was also mentioned at the IEFC and that persons who need to transport material of large size in/out of the machine should always contact beforehand the facility coordinator to avoid important loss of beam time due to patrols that could have been avoided.

S. Deleval informed that the access for the water problem was not requested by EN-CV and that the cooling circuits of the PS were working properly. The problems occurred at the interface of the different systems and the EN-CV equipment. **C. Rossi** informed that, concerning the C80, there was a problem with a power supply. **M. Hourican** informed that, concerning the intervention on the SMH57 pump, a new procedure has been prepared to intervene from the surface and avoid the ring access.

East Area Users

B. Rae informed that there were no major problems to report.

nToF Users

M. Barbagallo informed that the physics with the ^{7}Be sample started. He asked details about the stop of the proton flux on the nTof target on Friday 15th April afternoon. **G. Sterbini** explained that the TT2 line switching-magnet for nToF beam was not powered due to a communication error with the power converter. For the same problem, the power converter status read by the control system did not show any error. The nToF beam was produced, but was sent to the PS external dump instead of the nToF target. In this situation no radiation alarm is triggered. After investigations from the PS island, the First Line was called and fixed the problem by changing the electronic communication card of the power converter.

AD

T. Eriksson reported that the work on the vacuum system of the AD ring was completed last week.

On Saturday AD had the first circulating beam. On Monday the deceleration was commissioned.

At the moment the setup of ejection is taking place. There were some hiccups due to problems with a frequency synthesizer. The expert was not at CERN and tried remotely to fix it. The situation improved, but it is not yet operational.

T. Eriksson informed that, if no major problems appear during the week, AD would be ready for the scheduled AD physics start on the 25th of April.

AD Users

There was no report.

SPS

K. Cornelis presented the SPS status (Annex 7). The NA Physics is not yet started due to the aperture restriction problem of the ZS2 and its replacement last Wednesday. The ZS2 needed to be conditioned during over the all weekend and the setting up of the NA started yesterday. **Helmut Vincke** asked if this aperture restriction could explain the high radiation level observed last year. **K. Cornelis** answered negatively explaining that the ZS was replaced during the last YETS.

On Friday an RF feedback cable broke and was repaired in shadow of LHC cryogenic problems.

K. Cornelis informed that most likely an access to re-align the ZS2 is needed. **Helmut Vincke** asked which intensity was extracted during the slow-extraction setup. **K. Cornelis** answered that the extracted intensity is 200e10 ppp. **Helmut Vincke** commented that if the intervention is needed it has to be done as soon as possible to avoid further irradiation of the equipment.

North Area

B. Rae informed that the North Area hardware checks are completed and that the NA is ready for the beam.

LHC

M. Lamont informed that the LHC commissioning is progressing well. Stable beam is expected next Friday. Next week the scrubbing run will take place. **K. Cornelis** asked if there would be a 24 h stop for the cryo-system reconfiguration. **M. Lamont** informed that this intervention is postponed.

Linac3

There was no report.

LEIR

There was no report.

CTF3

D. Gamba reported on the status of CTF3 (Annex 8). **M. Gourber-Pace** informed that the problem with the *dctfgunp* front–end was fixed this morning.

TI

J. Nielsen presented the major events of the last week (Annex 9). On Sunday there was an electric alarm in BA3. During the re-powering test some smoke developed. The RF piquet and the Fire Brigade were on site. **Helmut Vincke** asked if the smoke was in an underground installation. **J. Nielsen** answered negatively.

Several electrical perturbations took place on Sunday, Monday and today probably due to the reconfiguration of the electric distribution network.

3. Schedule Updates

B. Mikulec presented the Injector Schedule 2016 v1.4 (Annex 7). Next week AD physics program is expected to start together with the 2016 MD program. **B. Mikulec** asked if there were special request for dedicated MDs. **H. Bartosik** informed that there was a request for a PS dedicated MD, which could not be scheduled due to the needed MD for the NA extraction and the LHC scrubbing run.

4. AOB

A. Bland informed that, due to a problem with an infected PC in the PS complex island, the operational password of several machines needs to be changed. After discussion **K. Hanke** proposed to change it on Wednesday morning (20th April). **B. Mikulec** will inform the teams involved.

Next Meeting: Tuesday 26th April 2016.

Minutes reported by G. Sterbini on 20th April

Summary of the 10th FOM Meeting

Held on Tuesday 26th April 2016

Agenda (https://indico.cern.ch/event/523246/)

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

There are two open actions (Annex 1).

1. Concerning the SPS QF ripple, **C. Mugnier** said that investigations are still ongoing. The action stays open.
2. Concerning the problem on DCCTs redundancy, **V. Kain** said that a first meeting with EPC would be held on the 27/04. The action stays open.

2. Status of the machines

Linac2

R. Wegner presented the Linac2 status (Annex 2). Only one fault occurred during the week with a 1h40 downtime due to a RF tanks cooling water interlock. The problem was identified at the PLC level and would be fixed during the PS stop scheduled on Wednesday afternoon.

PSB

E. Benedetto presented the PSB status (Annex 3). The injection septa of rings 1, 2 and 4 tripped on Sunday at 5 AM and caused a downtime of 4h50. After an access to the machine, a cooling circuit electrovalve was found broken and replaced. During the week, a lot of work was done on beam fine tuning.

ISOLDE

E. Matli presented the ISOLDE status (Annex 4). It was a pretty good week with 83% availability for GPS and 94% for HRS.

ISOLDE Users

K. Johnston said that the users were satisfied with the beam, especially on HRS, which had a very smooth week.

PS

R. Steerenberg reported the PS status (Annex 5). It was a reasonable week with 83% availability. Many small issues with RF cavities caused 11 hours downtime. An issue with the main magnet interlock system, which triggered a fake over temperature fault, resulted in a stop of the POPS and a 7 hours downtime.

The PS delivered the LHCPROBE, LHCINDIV and the LHC25 ns beam to the SPS for the LHC and scrubbing in the SPS. The MTE beam was delivered in different flavors, but as of Friday the standard operational MTE physics beam was delivered to the SPS, although still at low intensity, as not all users required beam. The AD beam was delivered to the AD for setting up and the nTOF beam was delivered for physics. The East Area North branch physics was started.

The POPS re-commissioning with DC-DC converter 1 is scheduled on Wednesday from 13:00 to 18:00. During that period, there will be no beam and no access to the machine.

B. Mikulec added that during the POPS intervention, the Linac2 and the PSB could be kept running, meaning that beam could be delivered to ISOLDE.

C. Rossi said that for what concerns the issues with RF cavities trips, investigations are ongoing and one of the ideas is to reinstall the previous type of power supply that tended to be less sensitive to radiation.

East Area Users

B. Rae informed that there were no major problems to report. The T9 beam line was started on Monday and T10 would be started during the day.

nToF Users

D. Macina informed about a one day stop, needed to remove one of the detectors, scheduled from Wednesday to Thursday, thus partly in the shadow of the POPS intervention.

AD

T. Eriksson reported the AD status (Annex 6). After the beam setting-up during the last week, physics started as planned on Monday 25/04. The deceleration efficiency and transverse emittances are

excellent. Due to a timing issue, the machine ran with a spare ejection septum since Saturday, which could entail horizontal position fluctuations (swap back planned on Wednesday).

S. Hancock asked why the intensity was ramped down. **T. Eriksson** answered that it was to avoid radiation alarms on a RP monitor. Intensity ramp-up would restart once the RP group would have moved the monitor (if possible).

AD Users

There was nothing to report.

SPS

H. Bartosik presented the SPS status (Annex 7). After the HV conditioning of the newly installed ZS, the setting up of the Fixed Target cycle could be resumed on Monday morning. The setup of the slow extraction and position scans of the ZS anodes revealed an internal alignment problem of the new ZS. During an access on Tuesday, the ZS tank 2 had to be horizontally displaced by almost 2 mm towards the inside of the machine in order to accommodate the optimal position of the anode for minimal losses within the range of the stepping motor. In the meantime EPC and EL experts worked on the power converter for the bending magnet MBB.2505 in the transfer line towards T6. They could trace back the problem to broken cable connectors on the 18 kV side of the transformer. EL had to pull new 18 kV cables and new cable heads had to be installed, which took until Friday afternoon (see AOBs). The power converter for the MBB.2404 bending magnet towards T4 has the same type of transformer and was therefore checked in a preventive measure. No problem was found on this transformer and it was put back online on Wednesday.

The beam was successfully extracted towards the T2 and T4 targets in the night of Wednesday. Setting up of the experimental beam lines started on Friday morning, after the BI expert changed the calibration of the BSI target intensity monitor from ions to protons. The beam was delivered to the experiments on Friday afternoon.

The machine availability for the LHC beam was generally good, with the exception of a few hours on Wednesday morning when a problem on the chilled water in BA3 tripped the main RF system. Otherwise the work on the LHC beams concentrated on the setting up of the 25 ns beam. The new automatic Laslett tune shift correction was successfully deployed. Based on the number of injections requested, the tune shift is corrected for each injection directly on the FGCs for the main quadrupole circuits.

First extractions of trains with 12 bunches could be performed on Wednesday and single batches of 72 bunches with 1.2e11 p/b within 2.6 um were sent to the LHC on Thursday for setting up in the LHC. During the weekend the SPS accelerated up to 4 batches to flat top for the conditioning of the MKE4 kicker and the new ZS. Three batches are ready for extraction to the LHC, however 4 batches still require further conditioning of the MKE as the vacuum interlock level is still reached from time to time.

A water leak on a power converter in TI2 requires an intervention of about 8 hours next week.

A vacuum issue was detected during the last night on the internal beam dump, TIDVG, and consequently no beam was delivered since 6:00 AM. Investigations are ongoing.

J. Ferreira said that given the radiation level in the dump area, a first access would take place at noon with a robot and an attempt of remote leak detection would take place. An intervention in the area has to be planned with RP. It was made clear that this issue would certainly entail a beam stop of 3 to 4 days for the NA (depending on the cool-down time).

D. Manglunki asked if the LHC INDIV beam could be delivered in the meantime. **R. Froeschl** answered positively.

Concerning the issue of the BSI target intensity monitor that was still set for ions, **B. Mikulec** asked to add it on the checklist for the next restart.

North Area Users

H. Wilkens informed that, given the problems on the MBB 2505 transformer, it was decided to delay the start of the COMPASS and NA62 experiments to Tuesday morning, and focus on providing beam to the testbeams over the weekend. The users from the CMS Ecal, GIF, CLIC detector R&D, and UA9 made good use of the available beam, and appreciated the efforts to provide 2 FT cycles per supercycle.

LHC

M. Lamont informed that there had been 4 fills over the week-end. Scrubbing started on Monday and could resume on Friday. In the meantime, they could go back to PILOT physics mode if the LHCINDIV beam can be provided.

K. Cornelis commented that if the dump would need to be vented, high intensity beam would certainly not be available immediately after the intervention.

Linac3

R. Wegner reported that measurements were ongoing and that 30 μA beam current was available at the end of the Linac3.

LEIR

D. Manglunki said that LEIR would take the beam on Monday as scheduled.

CTF3

There was no report.

TI

R. Ledru presented the major events of the last week (Annex 8). Besides the water cooling failure on the Linac2 already discussed, two electrical perturbations took place on Wednesday and Saturday.

On Sunday, an access door in TT2 appeared not to be well closed. Investigations are ongoing.

D. Chapuis said that it would be checked during the next access (probably on Wednesday).

3. Schedule Updates

B. Mikulec presented the Injector Schedule 2016 v1.4 (Annex 9). Given the issue with the SPS internal beam dump and POPS intervention, the MDs would not take place on Wednesday. Only ISOLDE beams would be produced during the POPS intervention.

4. AOB

C. Mugnier reported on the MBB 2505M (TT20) issue (Annex10). An 18 kV cable connector was found broken at the 18 kV / 2*282 V transformer. One bimetallic lug was broken and the two others broke when the cover was removed. The three 18 kV cables were then replaced and tested. MBB 2502 was back in operation on Friday 22/04. There is only one other similar transformer. Its cable lugs were inspected and found to be in good shape.

Next Meeting: Tuesday 3rd May 2016.

Minutes reported by JB Lallement on 28th April

Summary of the 11th FOM Meeting

Held on Tuesday 3rd May 2016

Agenda (https://indico.cern.ch/event/525515/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *AOB (POPS incident, SPS TIDV)*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

There are two open actions (Annex 1).

1. No update concerning the SPS QF ripple. The action stays open.
2. Concerning the problem on DCCTs redundancy, **B. Mikulec** reported on the outcome of an informal meeting with EPC. **JP. Burnet** said that the group has a long-term strategy for all the machines; redundancy is related to the deployment of the new power converters. **V. Kain** will provide him a priority list of power converters for the SPS that are critical and should be replaced ahead of LS2. The action was closed.

2. Status of the machines

Linac2

R. Wegner presented the Linac2 status (Annex 2). The main downtimes were due to external faults. Friday morning, the restart took 4.5 hours after the electric glitch. Saturday morning the Linac2 stopped due to a failure of the cooling station and an electric glitch for about 1h15 min downtime. Monday morning another stop of the cooling water induced a 30 mins downtime (see TI report for what concerns the Linac2 water cooling station).

PSB

B. Mikulec presented the PSB status on behalf of **K. Hanke** (Annex 3). The main issues of the week were due to external reasons (power cut, Linac). There were a number of EPC issues when re-starting

after the glitches. The MPS seems to need systematically the Power piquet to re-start. The time needed to re-start the power supplies exceeds the one caused by the power cut itself. The brightness of the LHC25 beam could be increased in all rings thanks to a change in working point.

ISOLDE

J. Rodriguez presented the ISOLDE status (Annex 4). It was a pretty good week with 86% availability for GPS and 85% for HRS. Main downtimes were due to electrical perturbations and Linac2 and PSB faults.

ISOLDE Users

K. Johnston said it was a reasonable week in spite of the relatively short run for GPS. There were some issues with the target for HRS. They nevertheless managed to collect good data with other isotopes.

PS

D. Cotte reported the PS status (Annex 5). The week was dominated by the POPS incident on Wednesday afternoon. The PS could be restarted on Thursday afternoon after the successful switch on of the rotating machine. On Friday and Saturday morning, electrical perturbations induced downtimes of 7 and 2 hours respectively.

East Area

Nothing special to report.

East Area Users

H. Wilkens reported that a group was working in T9 on CMS upgrade High Granularity Calorimeter and Timing detector and another group was working on the ALICE Inner Tracker System in T10. Both groups will extend their run to the long weekend, at reduced number of spills, so that the IRRAD & CHARM facility can run at high duty cycle.

nToF Users

D. Macina said it was a pretty good week for nToF. They will have a one-day stop next week for an intervention on the collimator. The limit from the DAQ leading to the exclusion of 2 consecutive ToF cycles will be lifted these days.

AD

T. Eriksson reported the AD status. When running, the AD performed well with good deceleration efficiency and dense beams delivered to the experiments. More than 30% downtime over the week due to PS POPS, Friday's power problem and various AD issues. Main AD issues were: False coil

temperature interlock on one ring bending magnet (TE/MSC repair), ejection septum timing problem due to 15MHz clock train transmission (BE/CO repair), target area safety chain "repli" on several occasions due to a faulty relay (**D. Chapuis** confirmed the repair). The cavity 10-25 sparking is under investigation.

AD Users

H. Wilkens reported that the ATRAP collaboration identified the cold leak on their apparatus, which they have been fighting since last year. The fixes are in place and the experiment is being recommissioned; aim at being ready for June. A new user schedule was distributed sharing the ATRAP shift between ASACUSA, ALPHA and AEGIS till week 22.

SPS

D. Manglunki presented the SPS status (Annex 6). No beam was sent to the North Area from Tuesday to Sunday because of the TIDVG failure. Low intensity beams were sent from Monday to T2, T4 and T6. The LHC beam production was also limited to 12 bunches - 25 ns. No beam was sent since Friday due to the P8 transformer failure.

S. Gilardoni added that no high energy MD beam should be sent to the dump.

North Area Users

H. Wilkens informed that the users received the beam on the last night for the first time since a week. In H2 the DREAM experiment performed energy scans till this morning, and was now moving to efficiency measurements. They will greatly profit from the MD time going to physics, allowing them to take some more hours of beam time. There was a problem on the XTDV affecting the TOTEM users in H8. COMPASS was performing the calibration of the E-cal with the low intensity beams. NA62 was receiving its first beam.

LHC

B. Mikulec on behalf of **M. Lamont** informed that the LHC hopes to be ready to take beam on Thursday morning, after the repair of the P8 transformer.

Linac3

R. Wegner reported that the beam was now available to LEIR.

LEIR

S. Jensen reported that it had been a very active week for LEIR. A first beam circulated in the ring last evening.

CTF3

P. Skowronski reported on the CTF3 status (Annex 7). There was a failure of the MKS12 klystron RF window, which was successfully replaced on Monday (there is only one RF window spare left – 3-6 months lead time). On Friday, the power cut caused a 3.5 hours downtime. The electronic gun failed on Saturday due to a problem with one of the communication optical fibers, which was replaced on Monday.

TI

J. Nielsen presented the major events of the last week (Annex 8). There were the major POPS failure on Wednesday afternoon and the 66 kV transformer short circuit at P8 on Friday morning. On Saturday morning, the Linac2 cooling station went down. The reason was found on Monday morning and a CPU was replaced. 3 electrical network perturbations occurred on Saturday, Sunday and Monday mornings. **B. Mikulec** asked if one of these network perturbations was due to the announced tests, but **J. Nielsen** replied that the only test on Friday was in the shadow of the P8 transformer problem.

3. Schedule Updates

B. Mikulec presented the updated Injector Schedule 2016 v1.5 (Annex 9). Awake commissioning will start on week 24. Elena HW commissioning will start on week 27. UA9 will take place on the 19/07. First ion beam will be available to the PS already on the 06/06, meaning 6 weeks earlier than the previous schedule to allow early setting up in the SPS.

4. AOB

POPS incident

F. Boattini reported on the POPS incident (Annex 10). POPS was running in degraded mode since February and the recommissioning of the DC1 converter was planned on the 27/04. All tests showed a good behavior of DC1. At POPS restart, one or two capacitor units were short circuited and the complete capacitor bank (3 MJ) discharged. The technical reason is not found yet, but it could be linked to a weakness in the capacitor design already identified during LS1.

POPS is being prepared to be run in degraded mode without DC1 and should be ready for week 22. The container needs to be completely emptied and new capacitors need to be installed. As these new capacitors need to be purchased, DC1 will not be back in operation before the next EYETS. In the meantime, POPS will continue to run in degraded mode and the PS rotating machine will be kept running as back-up. It is still too early to give a definitive long-term schedule, as the ordering of capacitors could take several months. The strategy for the run in the coming months has to be discussed with CERN management.

Answering a question from **B. Mikulec**, **F. Boattini** said that the spares they received from all qualified suppliers are now under test and the decision of which supplier to retain will be taken in the coming weeks. He added that given the capacitor design, the failure analysis will take some time.

R. Steerenberg acknowledged the different teams involved for their prompt reactions to bring back into operation the rotating machine, which reduced the PS downtime to less than 24 hours.

SPS TIDVG vacuum leak

J. Ferreira reported on the TIDVG vacuum issue (Annex 11). The pressure increased in 3 steps on the 25/04 around the TIDVG. The remote leak detection that took place on the 26/04 was inconclusive and a RGA on 27/04 confirmed the presence of air. The vacuum team accessed the machine on the 28/04 for a manual leak detection and confirmed the leak on the TIDVG (up to $6.6e^{-5}$mbar.l/s).

M. Calviani reported on the TIDVG present status and future plans (Annex 12). It looks like the leak is located inside the dump core. In the present situation, LHC type beams are limited to 72 bunches and beams for physics have an intensity limited to $1e^{13}$ protons. The situation is presently rather stable.

There are 2 other existing dump cores: The first one is damaged and cannot be repaired, the second one was used from 2006 to 2013. It is also damaged, but could be re-used after some cleaning. The present plan is to prepare the second core for beam and to repair the present TIDVG once removed from the machine. Given the time needed to produce a new core (2.5 years), a new simplified core will be designed and built to be used as a spare. It could be available by the end of the year. The second core will be put under vacuum for the week-end, and the bake-out could start on Monday 9/05. An update will be given next week.

B. Mikulec asked how long would last the bake-out. **J. Ferreira** answered that depending on the technique they will use (still under definition), it could take up to 3 weeks in total.

H. Wilkens commented that the COMPASS experiment cannot do physics with the present low intensity.

S. Gilardoni said that while the spare is not ready, the intensity should not be ramped up.

Next Meeting: Tuesday 10th May 2016.

Minutes reported by JB Lallement on 4th May

Summary of the 12th FOM Meeting

Held on Tuesday 10th May 2016

Agenda (https://indico.cern.ch/event/527449/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *AOB (update on the SPS TIDVG)*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

There is one open actions (Annex 1).

1. No update concerning the SPS QF ripple. The action stays open.

2. Status of the machines

Linac2

JB. Lallement presented the Linac2 status (Annex 2). There were two Linac faults last week. On Monday, the RFQ F. James amplifier was replaced (2 hours downtime). On Wednesday, the DTL tank3 ignitron broke and was replaced (2.5 hours downtime). Very smooth operation over the long week-end.

PSB

A. Findlay presented the PSB status (Annex 3). There were 2 hours downtime over the week due to PSB faults: A water leak in the cooling circuit for the injection and extraction line supplies and the MPS that had to be reset locally.

Work continued on trying to reduce the vertical emittance on R4 for LHC25ns. There were a number of MDs to investigate the losses on R3 around 4L1. The scaling factor to calculate the PS stray field was corrected and it resulted in a significant improvement in the injection trajectory.

ISOLDE

M. Lozano Benito presented the ISOLDE status (Annex 4). It was a very good week for both HRS and GPS with 100% and 99% availability respectively.

ISOLDE Users

K. Johnston said it was a reasonably good week for the users. On Sunday, the main laser used for the ionization scheme failed. As a back-up, they are now using a new scheme.

PS

M. Fraser reported the PS status (Annex 5). Except for Monday morning's electrical network problem (SIG), the PS had a relatively calm week. The intensity for MTE sent to SPS was interlocked with the internal dump in the PS at 550 ppp on request of EN-STI (TIDVG issue). Experts worked on LHC50 to make it operational before the long weekend (1.3e11 p/b). Over the weekend EAST North stopped taking beam and all spills were instead delivered to EAST IRRAD. LHCPROBE and LHCINDIV were provided for LHC towards the end of the week as it re-started. Over the weekend LHC25 12 and 72 bunches were provided for injection tests and finally physics. The RP monitor next to the TOF target occasionally tripped the beam. In agreement with the RP group the radiation detector will be re-positioned, re-calibrated and the beam steering adjusted on the target.

East Area

L. Gatignon reported that CHARM and IRRAD had a smooth run with maximum number of cycles. The North branch was running fine when used. T10 is running smoothly with 1 spill per super-cycle.

East Area Users

H. Wilkens reported that ALICE/ITS is taking the beam in T10 since Sunday. The remaining protons are sent to the irradiations facilities to allow for high dose accumulation on the installed samples.

nToF Users

D. Macina reported that the request of 2.4 s between bunches can be removed, as the DAQ can now stand 1.2 s consecutive bunches, but that it is however preferable to space the bunches by 2.4 s whenever possible. There was a stop on Monday to change the collimator and data taking with beam restarted in the evening. Many accesses would take place until Wednesday to allow a few tests and the installation of a new experiment.

AD

B. Dupuy reported the AD status (Annex 6). It was a pretty good week with 97% availability. Instabilities were observed with the stochastic cooling. They were solved by adjusting the phase at injection, which now makes the bunch rotating correctly.

AD Users

H. Wilkens reported that the users were satisfied with the AD performance.

SPS

K. Cornelis presented the SPS status (Annex 7). As consequence of the issue with the TIDGV, fixed target beams are limited to 1e13 p per cycle and one cycle per super-cycle. LHC beams are limited to 72 bunches with 1.1e11 ppb. The frequency of the QF ripple increased in the night from Wednesday to Thursday and was especially seen during slow extraction. Vacuum conditions at and close to the TIDGV were stable over the entire week.

Answering a question from **B. Mikulec**, **C. Mugnier** confirmed there was not update on the QF ripple investigations.

H. Vincke asked when an intensity ramp up was foreseen. **K. Cornelis** answered that the present intensity limitation will be kept until the spare dump is ready.

North Area

L. Gatignon informed that all beam lines are now running. COMPASS is suffering from the low intensity in T6. The NA62 beam setting-up took place over the week-end and is now completed. On Monday, beam was accidentally sent to the detector while the spectrometer power converter was being repaired; fortunately with no consequences. It was found that the BSM 26 m upstream of T4 (used for tuning the angle at T4) had to be moved 6 mm away from its previous position (8 mm from theoretical position) to go properly through the P42 TAX hole. This changes very slightly the production angle for H6, H8 (but should not be noticeable).

K. Cornelis said that he had no explanation for the 6 mm difference, answering to the question from **L. Gatignon**.

North Area Users

H. Wilkens insisted on the serious impact of the intensity limitation on the COMPASS experiment, which would not allow them to fulfill the planned physics program. The present intensity represents 1/10 to 1/6 of the nominal beam.

LHC

M. Lamont informed that the LHC recovered from the P8 converter fault and beam was restarted on Thursday morning. 300 bunches are now circulating in the machine. The van der Meer beam will be requested on Wednesday or Thursday.

Remark: According to updated information from the LMC on 11/05, the van der Meer beam will be requested on Tuesday and Wednesday next week.

Linac3

JB. Lallement reported that the source ovens were refilled on Monday, but that a water leak was found on a source waveguide. A first repair failed on Monday and another repair was ongoing.

LEIR

J. Axensalva reported that LEIR was ready to take beam and was just waiting for the Linac3 source to be restarted.

CTF3

There was no report.

TI

J. Nielsen presented the major events of the last week (Annex 8). A water leak was found on the Booster cooling on Tuesday and was fixed after a 40 min stop. On Friday the BE91 secure network tripped and caused the SPS ventilation to stop. No apparent reason was found and it will be followed up. On Sunday, a leak was found in the BA6 cooling towers and its repair should be scheduled for TS2. An electrical perturbation was observed on Monday on the 400 kV network with no impact on the complex.

3. Schedule Updates

B. Mikulec presented the updated Injector Schedule 2016 v1.5 (Annex 9).

4. AOB

SPS TIDVG vacuum leak

M. Calviani gave an update on the TIDVG status (Annex 10). The TIDVG vacuum level was very stable over the last week and the present intensity limitations should be kept until the spare dump is ready. Concerning the core 2 ('spare' dump under preparation), the aperture was cleaned and the graphite seems to be intact. It is now vacuum-tight and the interconnections of the water circuit were done. The bake-out was about to start and the spare should be ready for week 22 or 23. Once it will be ready, the LHC beam intensity could be ramped up adiabatically while monitoring the vacuum. The decision to replace to dump with the spare will then be taken depending on vacuum stability. The intervention could take a week. In parallel, the production of the 'simplified design' spare dump, whose design is being finalized, will be launched to be ready for the EYETS.

H. Vincke asked if the intensity ramp-up could be kept as short as possible. **S. Gilardoni** answered that the ramp-up should be done in sufficiently small steps to be able to monitor the vacuum evolution and not to induce too important mechanical stress that could break the dump too quickly. The first step would be to go from 72 to 144 bunches. **M. Calviani** added that there is also a risk installing a spare, and one should consider preserving the present dump.

M. Lamont commented that limiting the SPS intensity to 144 bunches for the rest of the year would not have an important impact on the 2016 LHC run performances.

S. Gilardoni said that they should get a better idea of how long the bake out would last by the end of the week and eventually be ready for an intervention during the next technical stop on 6th June.

Answering a question from **B. Mikulec**, **S. Gilardoni** said that the option of postponing the TS2 by a week had been discarded at the LMC.

Next Meeting: Tuesday 17th May 2016.

Minutes reported by JB Lallement on 11th May

Summary of the 13th FOM Meeting

Held on Tuesday 17th May 2016

Agenda (https://indico.cern.ch/event/531827/)

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The minutes of the last FOM were approved.

The list of presence can be found in Annex 0.

There was one open action (Annex 1).

1. Concerning the SPS QF ripple, **C. Mugnier** explained that no events were observed during the last week. The past events cannot be exploited for the analysis since the logging of the relevant signals was not in place. The action stays open.

2. Status of the machines

Linac2

D. Küchler reported on the Linac2 weekly statistics (Annex 2). The availability of the machine was 99.96%. Over the last days an increase in the number of the missing shots was observed. Preliminary investigations show that the source is behaving as expected, so the problem seems related to the tail clipper.

D. Küchler mentioned that some data were not correctly logged. **M. Gourber-Pace** asked if the beam was delivered during this period. **D. Küchler** answered positively mentioning that in the downstream BCTs the beam intensity was correctly measured and logged.

PSB

J.-F. Comblin reported on the PSB weekly statistics (Annex 3). The total availability of the machine was 95% with about 8 h and 30 min of downtime (mainly dominated by the injection septa and extraction kicker faults).

Wednesday (11th May) during the night, the injection septum went in fault for a problem with an electro-valve. Power piquet, RP piquet and the specialist were called and finally an intervention in the ring was needed to replace it (5h 9min downtime).

Saturday (14th May at 02h00) the 4 ejection kickers tripped due to a detected leak of the hydraulic system. The specialist solved the problem with a remote reset (1h 53min downtime).

The Van der Meer (VdM) beam is ready for the LHC.

Concerning the problem with larger vertical emittance of the Ring 4, it seems that it is a measurement problem. Comparative measurements with SEM grids on BCMS and VdM beams seem to confirm it. The issue will be followed up with the specialists in the next weeks. Related to this problem **J.-F. Comblin** asked the BI team to provide a list of settings to use for different beam intensities. **B. Mikulec** added that this is also valid for the PS. An action was opened for BE-**BI**.

ISOLDE

E. Fadakis reported on the ISOLDE weekly statistics (Annex 4). It was a good week for both HRS and GPS with 98.4% and 94.2% availability, respectively.

On Wednesday there was a water interlock on the separator magnets solved by rebooting several times the crate.

ISOLDE Users

E. Fadakis reported on behalf of **K. Johnston** that the users were satisfied of the beam quality.

PS

A. Guerrero reported on the PS weekly statistics (Annex 5). The beam availability was 90%.

The MPS tripped several times with a total downtime of 1h50m due to a water flow issue. The SMH16 was down for a total of 1 h due to a power supply issue. An intervention on the injection bumper BSW43 to change an auxiliary power supply was needed (30 min downtime). Two 10 MHz cavities were in fault causing 30 min beam downtime.

There were several RF issues affecting different beams. The h8 beams suffered on several occasions of a phase loop offset deregulation. The delivery of the LHC50ns beam on Wednesday was affected by an unexplained return delay misconfiguration in a 20 MHz cavity. An issue on double splitting delayed the LHC filling due to the beam quality on Sunday night. Finally it turned out that the issue was related to the 20 MHz problem. The 200 MHz cavity piquet was called during the week-end.

All operational beams have been delivered including the Van der Meer LHCINDIV with horizontal and vertical emittances of 3 and 3.6 mm mrad, respectively.

M. Hourican commented that several faults were attributed to the TE-ABT group, but were related to TE-EPC equipment. **R. Steerenberg** informed that the entries would be corrected and these faults attributed to the TE-EPC group.

East Area

L. Gatignon informed during last week that all spills were dedicated to IRRAD.

East Area Users

H. Wilkens informed that during last week there was no physics user for the East Area. All the available East cycles were delivered to IRRAD. Two groups of testbeam users will install their equipment tomorrow (18th May) in T9 and T10.

nToF Users

No nToF representatives could attend the meeting.

AD

J. C. Oliveira reported on the AD weekly statistics (Annex 6). It was a calm week**.** For about 15 times the PS did not deliver beam without clear reason. Investigations are ongoing. The AD efficiency is higher than last year.

AD Users

H. Wilkens informed that the AEgIS collaboration canceled its shifts for this week, in order to switch from the test experiment to the main device. As only ASACUSA and ALPHA can take beam, a number of AEgIS shifts will be devoted to the AD machine development.

SPS

K. Cornelis reported on the SPS weekly statistics (Annex 7). The availability of the machine was almost 78.8% by considering as fault period also the time spent for the LHC filling (Fixed Target beam cannot be delivered during LHC filling).

SPS is still working in degraded mode due to the problem with the internal dump. This limits the intensity of the Fixed Target beams to 1000e10 ppp and to 72 bunches for LHC beams.

Dedicated MDs were performed last Wednesday on the 50 ns beam at 26 GeV. During the same day a problem with a ventilation door in TAG42 delayed the LHC fill.

On Friday a power glitch perturbed the operation, but the SPS could recover rapidly.

Longitudinal problems in the PS caused difficulties for the LHC filling since Sunday evening.

North Area

L. Gatignon informed that, apart from a problem with one of the NA62 power converters on Thursday (now solved), the operation was smooth.

North Area Users

H. Wilkens informed that the users were satisfied of the beam quality despite the periods without beam during LHC filling. COMPASS is still running with low intensity, following the limitations imposed by the TIDVG vacuum leak.

LHC

M. Lamont informed that the intensity ramp-up was progressing. A total of 900 bunches were injected into the LHC. Presently and for two days the run will be dedicated to VdM scans.

Linac3

D. Küchler reported that during the first part of the week Linac3 could not deliver beam due to a water leak. The first repair attempt was not successful. Beam was available again on Wednesday afternoon and since then the beam intensity is stable.

LEIR

M. E. Angoletta reported on the LEIR weekly statistics (Annex 8).

It was a short week due to the Linac3 leak problem. Progress was made at LSAfying the LEIR transfer lines. Debugging is still ongoing. The machine intensity is good (2E10 for EARLY). The beam was captured, accelerated and synchronized on EARLY + NOMINAL.

CTF3

There was no report.

TI

J. Nielsen commented that there was nothing in particular to report apart from the Friday glitch on the electrical network. The glitch was confirmed by EDF.

3. Schedule Updates

B. Mikulec presented the updated Injector schedule 2016 v1.5 (Annex 9).

Next week the UA9 run is scheduled. The week after, the first LHC MD block will take place. **B. Mikulec** informed that the LHC MD beam requests would be discussed in the next FOM. **H. Bartosik** informed that, in addition to the standard beams, the 25 ns BCMS beam will be requested.

In three weeks time the Second Injector Technical Stop will take place. **B. Mikulec** commented that it is important to collect the different IMPACTs as input for the RP team to evaluate the needed cool-down time. After the TS the COLDEX run will take place.

Concerning the dedicated MD tomorrow (18th May), **H. Bartosik** informed that the SPS would not deliver beam to the NA. In the PS two dedicated MDs have been scheduled: on the new transverse damper and on the new PFW power converter.

4. AOB

B. Mikulec informed that **M. Calviani** could not join the meeting. A complete update on the SPS internal dump situation was given during the last IEFC. **J. Ferreira Somoza** commented that for the moment the degassing of the spare dump is proceeding according to plan.

Next Meeting: Tuesday 24th May 2016.

Minutes reported by G. Sterbini on 18th May

Summary of the 14th FOM Meeting

Held on Tuesday 24th May 2016

Agenda (https://indico.cern.ch/event/533262/)

1. *Follow-up of the last FOM*
2. *Beam requests for LHC MDs*
3. *Status of the machines*
4. *An update on the MPS incident*
5. *Schedule Updates*
6. *Dedicated MD Updates*
7. *AOB (activities in the ITS2)*

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 last FOM were approved.

B. Mikulec informed that due to the PS MPS incident the agenda of the meeting was modified. **C. Mugnier** will present an update of the MPS incident and the report from the Facility coordinators will be postponed to the next FOM.

There were two open actions (Annex 1).

1. Concerning the SPS QF ripple, **C. Mugnier** explained that, mainly due to the complex downtime, no events were observed during the last week. The action stays open.
2. Concerning the official wire scanner setting for the measurement of the transverse emittances in the injections, no BI representative joined the meeting. The action stays open.

2. Beam requests for LHC MDs

G. Papotti presented the beam requests for the LHC MDs (Annex 2).

The next LHC MD block will take place from Wednesday 1st June to Monday 6th June (early morning).

In most cases, standard beams will be requested.

Special LHCINDIV with specific longitudinal emittances will be requested for the longitudinal impedance studies. As in the past, it will be set up by the SPS RF team.

For studying the beam dynamics (emittance preservation) of high brightness beams, 25 ns BCMS will be requested as already announced in the last FOM.

K. Cornelis commented that due to the internal dump limitation only trains up to 72 bunches could be delivered to the LHC. **G. Papotti** explained that it is compatible with the present LHC MD plan.

D. Manglunki asked if during the LHC MDs frequent fills are expected. **G. Papotti** answered that most of the MDs need high-energy beam, therefore reduced injection duty cycle.

H. Wilkens asked if the SPS UA9 experiment could be combined with the crystal collimation LHC MD. **G. Papotti** answered that the same team is participating to the two MDs thus putting constraints on the schedule. Anyhow an optimization in this direction can be explored.

K. Cornelis added that before the next Injector Technical Stop (ITS2) the SPS needs to take some reference measurements with coasting beam. This element should also be considered for rescheduling the UA9 experiment. **B. Mikulec** commented that a new schedule for COLDEX and UA9, taking into account the different needs, would be finalized before the next FOM.

3. Status of the machines

Linac2

R. Wegner reported the Linac2 status (Annex 3). Linac2 is running well. An increasing number of missing pulses was observed on Friday, which was solved by increasing the H_2 gas flow. On Sunday morning there was no beam for about 3.5 h. The PLC responsible for controlling the majority of beam stoppers on the Meyrin site was down due to the opening of circuit breakers. Once reconnected, Linac2 could be restarted.

An MD was performed together with the PSB to optimize the phase setting of the Linac2 de-buncher in order to reduce the power demand from the driving amplifier.

The Linac2 intensity delivered (BCT60) is typically 145 mA.

PSB

G.-P. Di Giovanni reported the status of the PSB (Annex 4).

It was a good week for the PSB. The Van der Meer (VdM) beams were delivered, together with STAGISO and NORMHRS beam to ISOLDE, on top of the standard operational beams.

On Thursday the extraction septum (BE.SMH15L1) had to be reset several times due to an external fault (downtime of 15 min). The problem reoccurred later and an access was organized. **M. Hourican** informed that, after the access, the problem was understood and solved**.**

In the night between Saturday and Sunday the BI.DIS0 tripped and a thyratron had to be replaced. Beam from Ring 1 could not be provided for about 2 h and 35 min. This did not cause any beam time loss, because at the time the only client was STAGISO, which is supplied by Ring 2, 3 and 4.

On Sunday morning the PLC of the beam stoppers in Linac2 and the BI line was out of order. The PSB operator helped the EN-STI piquet to track back the faulty PLC and restart it by closing the circuit

breaker. The total downtime amounted to about 3 h and 25 min, impacting on the NORMHRS data taking.

A. Findlay worked on the BCMS beam by improving the settings of the longitudinal plane to meet the required specifications. The BCMS beam is ready, but some more work is needed to stabilize its intensity fluctuations.

Last week **M.-E. Angoletta** commissioned a new version of the LLRF firmware to allow an adiabatic transition from the fixed frequency to the B-Train, considerably improving the process. This new feature is now operational.

Several MD investigations for both the Linac2 and the PSB were carried out over the week, in particular studying the asymmetric profiles obtained by the wire scanner measurement in Ring 4, which needs follow-up by the BI group.

ISOLDE

E. Siesling reported the status of ISOLDE (Annex 5).

It has been a busy but good week for ISOLDE. The two separators ran in parallel: HRS with full intensity (2 μA, NORMHRS proton beam) and GPS with modest intensity (max 8E12ppp, STAGISO proton beam).

GPS: Change to the Sn target (#514) was performed last Tuesday after which stable setting-up started. Proton scan with STAGISO and yield checks was done on Wednesday after which collections on Cd at the GLM line started and lasted, as scheduled, until Saturday evening. Target change was done on Monday (23rd May). The target heating went down on Friday afternoon without clear reasons. It could be reheated and the run continued.

HRS: Change to the ZrO (#551) target was done last Tuesday. Stable molecular beam SeCO setting-up was done the same day through the separator magnets and RFQ and used by the TAS users to their setup in the RC3 line overnight. Proton scan was done Thursday afternoon followed by yield checks. Radioactive run started on Thursday evening. Users finally went for GeS. The run continued successfully over the weekend and will be possibly extended until Wednesday.

ISOLDE Users

K. Johnston informed that the users are satisfied with the present beam conditions.

The HRS run was finally performed with Germanium (as requested) instead of Selenium (as initially planned since Germanium was expected not to be available).

PS

D. Cotte reported about the status of the PS (Annex 6).

The BCMS setting-up started and the MTE beam intensity was increased to 800e10 ppp, but the average beam availability was only 50% and the week was dominated by the incident with the rotating machine.

D. Cotte explained the dynamics of the incident with the MPS (arc produced in the electric network downstream of the rotating machine). More details are available in 'An update on the MPS incident'.

D. Manglunki reported that an access was organized in the Switchyard this morning (24th May) and the LEIR chain tripped. He reminded that in case of access in the Switchyard, the LEIR team should be informed in advance.

East Area

L. Gatignon reported that the running of IRRAD and CHARM was smooth till Wednesday morning. On Wednesday evening all beams were stopped again till Thursday late morning due to a water leak diagnosed under a 4 m thick shielding wall on the South side of the hall, being repaired now. In T9 and T10 new users were installing. T10 was ready to start on Thursday early afternoon, T9 only on Friday afternoon. On Thursday First Line had to be called twice for ZT10.QFO4. The first time (afternoon) it could be fixed quickly, but in the evening/night the First Line team had to give up after some 6 hours. It was then fixed by the expert by noon, but by then the MPS had failed.

East Area Users

H. Wilkens informed that due to the problem of the last week, the User schedule is going to be reorganized.

nToF Users

D. Macina informed that, while waiting for beam, nToF is performing an extensive calibration campaign and accesses for hardware maintenance.

AD

L. Joergensen informed about the status of AD (Annex 7).

The machine ran very well with no downtime on its side. AEGIS gave up their beam time as they have problems getting their apparatus ready; the two other experiments (ASACUSA and ALPHA) struggled to use the extra beam time, so the planned AD MD on Monday, was moved from Tuesday to Thursday.

AD had a few problems re-starting the machine again after an access on Wednesday, but with the help of the specialist they were fixed.

Thursdays MD was mainly dedicated to the BBQ system for the AD.

The AD delivered beam to the two experiments during the evening and night without problems. From Friday morning onwards no beam could be delivered due to the MPS problem.

AD Users

H. Wilkens informed that last week ASACUSA and ALPHA were the only users ready to take data. **H. Wilkens** informed that the BASE experiment observed a noise pattern with a period of 25.6 min (200 mHz) and asked to contact him to suggest possible sources of this noise.

SPS

V. Kain reported the status of the SPS (Annex 8).

The SPS is still running in degraded mode due to the TIDVG vacuum issue. With the reduced intensity and duty cycles, the vacuum level at the TIDVG situation is however stable.

At the beginning of the week the LHC 25 ns beams caused high losses at SPS extraction as well as in the LHC injection region due to re-capturing initially uncaptured beam. The increased amount of uncaptured beam originated from a PS RF problem. That was solved in the course of the day on Tuesday. Tuesday night the LHC was again struggling with losses at injection. Losses were relatively high in the transfer line TI2 due to non-optimum scraper settings. The real problems were however longitudinal losses for LHC beam 1. The origin of these losses is not yet understood (possible candidates are the LHC RF beam 1 or the injection slot cleaning). During tests with and without improved scraping the issue could not be re-produced. **V. Kain** mentioned that it is very important to have the adequate instrumentation in the SPS to rapidly detect this kind of problem (e.g. diamond detectors). **B. Mikulec** asked if actions in this direction are taken. **V. Kain** answered that discussions are ongoing. **R. Steerenberg** commented that, on Tuesday, losses were observed only in beam 1 and not in beam 2. From that one could conclude that they were not caused by the low energy injectors.

SPS prepared also the beams for the LHC VdM scans this week with the required characteristics.

An interlocking issue was discovered on Tuesday when one of the bumper magnet circuits was off causing a large orbit oscillation around the ring on an LHC cycle. The bumper magnet circuits for the LHC extractions are not surveyed in the ring interlock system, only in the extraction interlock system. An SIS interlock has now been implemented.

The normalized losses on the ZS had increased by 10 % over the last weeks. The TE-ABT team re-aligned the anodes with low intensity of 1.5e+12 ppp and only one injection and managed to re-establish the original situation. The reference positions had to be modified by 100 to 200 μm.

The COAST on the new cycle for UA9 was briefly tested on Wednesday.

On Thursday the intensity of the fixed target cycle was increased to 1.5e+13 protons without any major issues (except initially more ZS sparks). The TIDVG vacuum does not seem to be affected.

Since Friday morning the SPS is off as a consequence of the incident in the building of the PS MPS.

As part of the impedance reduction campaign, HW modification (soft clamp installation) will be performed during the ITS2. Reference measurements with coast beam need to be performed before the intervention. For that reason, UA9 could be schedule on Sunday 5th June (before the ITS2 moved on the 6th June). In this case UA9 could contribute also to the machine cool down.

V. Kain proposed to reschedule COLDEX on Wednesday 8th June (after the ITS2 and using the dedicated MD slot in the SPS). **B. Mikulec** commented that a new schedule for COLDEX and UA9, taking into account the different needs, should be finalized before the next FOM.

North Area

L. Gatignon informed that the running was smooth until Friday morning. On Wednesday during the MD, it was tried without success to reproduce the condition that sent beam into the NA62 detectors the week before. After the Wednesday MD the intensity was increased to 1.5 10^{13} ppp in the SPS, gaining a factor 2 for COMPASS. Since Friday morning no beams were delivered.

North Area Users

H. Wilkens mentioned that users are waiting for the beam.

HiRadMat

L. Gatignon informed that HiRadMat is planning to perform AWAKE BTV tests as soon as the beam permit for low intensities will be signed.

AWAKE

C. Bracco informed that the hardware commissioning of AWAKE started. The high voltage tests of the main dipoles and correctors are going to be performed.

The commissioning will continue for the next three weeks.

B. Mikulec asked what kind of beam would be requested. **C. Bracco** explained that only LHC pilot beam would be used for the moment.

LHC

R. Steerenberg informed that the LHC is profiting from the forced stop to make interventions and accesses. As soon as the beam will again be available the goal is to recover rapidly the high intensity (1200 bunches). Before the intensity ramp-up, VdM scans will need to be performed again for CMS. **B. Mikulec** asked about the parameters (intensity and emittance) of the VdM beams. **R. Steerenberg** said that the parameters have to be verified with the LHC team.

Linac3

R. Wegner reported the status of Linac3 (Annex 9). It was running well with the exception of few resets. The oven was refilled yesterday (Monday 23rd May). The intensity at the end of Linac3 (BCT41) is typically 30 µA.

LEIR

S. Pasinelli reported the status of LEIR (Annex 10[1]).

[1] The presentation was uploaded on the FOM site after the meeting.

The LEIR week was dedicated to the setting-up and mainly devoted to

• Cycle generation studies

• The re-organisation of LSA DB (k-driven instead of I-driven)

• Creation of the injection and ejection processes

• Injection correction with YASP.

S. Pasinelli informed operation was hampered by recurrent sampler errors.

S. Pasinelli reported that the Linac3 performance was excellent (30 μA).

CTF3

There was no report.

TI

J. Nielsen reported the main TI issues of the week (Annex 11).

On Wednesday the PSB lift went into fault (an intervention of 4 h has to be planned to repair it) and the H4 line in the North Area could not be served due to a fault in an access door.

The main event of the week was the MPS fault on Friday. More details are available in 'An update on the MPS incident'.

On Sunday perturbations with the beam stoppers hampered the operation of Linac2 and PSB. Finally it was related to an electric power problem on the PLC controlling the beam stoppers. **J. Nielsen** commented that the intervention was long due to the difficulties to find the location of the crate. The information exists, but the integration between the EDMS and GIS Portal database is not yet optimized. Discussions are ongoing with IT to improve it.

4. An update on the MPS incident

C. Mugnier reported on behalf of **J.-P. Burnet** the PS powering status (Annex 12).

The sequence of the different faults to the PS POPS was recalled (first fault of the IGBT, second fault of the IGBT, incident with the capacitor bank and incident with the MPS).

The MPS can be repaired in two weeks if no damage occurred to the mechanics of the rotating machine.

The plan is to perform all the necessary tests to POPS and to put it back into service on Wednesday (25th May). It will be operated in degraded mode (only 5 over 6 capacitor banks available). Even if in degraded mode all operational cycles can be delivered.

5. Schedule Updates

B. Mikulec presented the updated Injector schedule 2016 v1.5 (Annex 13).

Due to the MPS incident, the UA9 run, foreseen today (24th May), had to be cancelled.

Tomorrow (25th May) the PS is expected to restart using POPS. **M. Bernardini** organized on Monday (23rd May) a meeting to advance as much as possible the activities foreseen in the ITS2 in the shadow of the MPS downtime. The ITS2 will be moved to Monday 6th June and will be of 8 h (access time). The access will start at 08h30, to be confirmed by RP when the full intervention list will be available. **H. Wilkens** asked why it was decided to anticipate it on Monday and not maintain it on Tuesday or Wednesday as originally planned. **B. Mikulec** and **D. Mcfarlane** explained that this was driven by the LHC. Some activities to be carried in the ITS2 will impact on the LHC cryogenics. In order to restart the LHC by Friday the ITS2 has to be anticipated to Monday.

B. Mikulec informed that the Facility Coordinator would report the ITS2 activities list during the next FOM.

All IMPACTs already created will be automatically transferred to the 6th of June.

The re-scheduling of COLDEX and UA9 will be discussed during the next days.

6. AOB

C. Mastrostefano presented the interventions list for the Linac3 during the ITS2 (Annex 14). One intervention request consists in replacing of the BCT41. This would imply venting the transfer line (ITH) in the Switchyard zone.

J.-A. Ferreira Somoza commented that in principle the intervention can be performed in 8 h, but in case of unexpected problems the ITS2 time window will be exceeded. **R. Scrivens** and **D. Manglunki** informed that the present BCT41 transformer is working correctly. The new one will have better performance in terms of noise. This is not critical for the machine operation. After discussion it was decided to move the BCT41 installation to the next EYETS.

A. Bland informed that the SPS logging server would be restarted today (24th May) at noon. This is a legacy non-ORACLE database mainly used for MD data. The server will be unreachable for 20 min.

B. Mikulec asked about the plan to increase the MTE beam intensity. **K. Cornelis** informed that the next step in the intensity ramp up would be 1e13 ppp per SPS injection (the present SPS intensity limitation is 2e13 ppp).

Next Meeting: Tuesday 31st May 2016.

Minutes reported by G. Sterbini on 27th May

Summary of the 15th FOM Meeting

Held on Tuesday 31st May 2016

Agenda (https://indico.cern.ch/event/536441/)

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 last FOM were approved.

There were two open actions (Annex 1).

1. Concerning the SPS QF ripple, **C. Mugnier** said that investigations are still on-going. A recorder was installed in order to monitor the events. The action stays open.
2. Concerning the official wire scanner settings for the measurement of the transverse emittances in the injections, a working group meeting will take place on Wednesday 01/06 to further discuss this issue. The action stays open.

2. Status of the machines

Linac2

M. O'Neil reported the status of the Linac2 (Annex 2). It was a very good week for the Linac2. The source flashover rate increased over the week-end. It will be monitored in the coming days.

PSB

B. Mikulec presented the status of the PS Booster (Annex 3). The machine ran smoothly during the last week. On Wednesday, the PS still being down, two dedicated MDs were performed and were both quite successful despite the short preparation time. The higher intensity version of the MTE was revived and has now to be checked with the SPS.

ISOLDE

E. Matli reported the status of ISOLDE (Annex 4). It was a very good week for both HRS and GPS.

ISOLDE Users

K. Johnston said it was also a very good week for the users with minor issues with the Laser. They switched to HRS last night.

PS

G. Sterbini reported about the status of the PS (Annex 5). The week was dominated by the fault of the PS main power supply. Thanks to the effort of TE-EPC the machine could be pulsed again on Thursday afternoon. On Monday it was decided to anticipate as many activities as possible scheduled for the next June Technical Stop. The access in the PS Ring started on Monday afternoon. In the shadow of the stop, a repair of a water leak on MU41 and an intervention on the figure-of-eight circuit took place. The main magnets started to pulse again on Thursday afternoon around 16h00. At 16h30 most of the beams were back. During Thursday night oscillations were observed on the MTE beam (poor splitting efficiency and jitter in the TT10 trajectories). Investigations were ongoing. On Friday morning, POPS was in fault for 20 min due to a trip on an IGBT. Following this episode, EPC specialists asked to reduce by 30% the number of cycles and suspend all the MD cycles in order to monitor the situation with a reduced cycling load (these limitations were removed on Monday). During the night First Line intervened on a quadrupole in the T10 line (ZT10.QF004). On Sunday morning the EPC piquet was called for a problem with the Septum 16 (1h40 downtime). On Monday, a problem on the PS TFB room entailed 40 mins perturbation. Despite of all the recent issues, the integrated intensity delivered to TOF is still on a good track.

East Area

B. Rae reported that the run was smooth for CHARM+IRRAD, T9 and T10 after the POPS restart despite the reduced number of cycles over the weekend.

East Area Users

H. Wilkens said that the users scheduled last week during the PS downtime extended their stay and are running parasitically to the users of this week.

nToF Users

D. Macina informed that nTOF will change experiment in EAR2 (end of the Be7 campaign). The change implies a stop of physics of about one week in EAR2. nTOF will try to resume beams during nights for EAR1 as soon as possible (most probably starting from Tuesday night) to minimize the impact on the EAR1 physics.

AD

L. Bojtar reported that the AD ran pretty well during the few days they got protons. There was only one issue with the access system Thursday night, when the beam stopper went in during the night in the DE0 zone apparently without any reason. Had to search the zone to open it, despite the fact that there was no indication of any fault or alarm on the zone. This might be related to the security tests which took place in the afternoon.

H. Vincke asked if the access system problem was solved, **L. Bojtar** answered positively.

AD Users

H. Wilkens informed that 3 users are scheduled for beam time this week: ATRAP, ALPHA and AEgIS. This is the first week of beam time for ATRAP as they fixed the heat leak into their apparatus, and needed the last week to re-assemble and recommission their detector.

SPS

H. Bartosik reported the status of the SPS (Annex 6). Due to the fault on the MPS the PS was not able to deliver beam for the first half of the week. This time could be used for performing most of the interventions originally planned for the injector technical stop in week 23. The PS came back on Thursday afternoon and the restart with beam was rather smooth. However the SPS still needs to be run in degraded mode due to the TIDVG vacuum issue. The fixed target cycle is presently operated at a maximum intensity of 2e13 ppp and at reduced duty cycle. Furthermore, the fixed target beam is not played during LHC filling. The nominal 25 ns beam delivered to the LHC is presently limited to single batches of 72 bunches. In these conditions the vacuum level at the TIDVG is stable at around 1.7e-7 mbar. A few hours downtime for the fixed target beam were accumulated due to a trip of the RF power caused by a thunderstorm, a problem with the PS extraction septum and due to the LHC filling periods. Otherwise no major issues were encountered.

S. Gilardoni said that the FT beam intensity limitation is 1.5e13 ppp and not 2e13. **B. Mikulec** said that this should be clarified after the meeting (in fact, right before the meeting, CERN management decided to increase the limitation to 2e13).

M. Lamont informed that a meeting will be held in the afternoon, concerning the decision on the next week's LHC technical stop which will be at least 2 days and might influence the date of the injector technical stop. After the meeting, he sent the following technical stop planning:

LHC TS1
06:00 Tuesday 7th June - stop beams.
12:00 Thursday 12:00 - end TS.
(Water leak repair in BA6 and cryo recovery)

Injectors TS2
03:00 Tuesday 7th June - stop high intensity beams
06:00 Tuesday 7th June - stop low intensity beams
08:30 Tuesday 7th June - start technical stop
17:00 Tuesday 7th June - stop technical stop
In the SPS the TS will be proceeded by UA9 and followed by COLDEX.

North Area

B. Rae reported that the restart went smoothly when PS and SPS came back. In the night from Saturday till Sunday First Line was called for QUAD.022.167 in the H4 beam (3 hours lost). The XTDV installation in H4 will take place next week. A small DSO tests of the XTDV is scheduled on Thursday 09/06 in the afternoon (in agreement with SPS/OP and LHC filling, a handful primary chain interlocks are expected).

F. Pirotte added that the beam would be stopped in the entire NA during the DSO test (intrusion tests).

North Area Users

H. Wilkens reported that NA61 tested the two Vertex superconducting magnets during the downtime last week. They operated stably for a week at nominal field. NA61 is confident on the good working state of the magnet and will use the highest energy (150AGeV) during the upcoming Pb ion run. The restrictions imposed on the FT cycles are still impacting severely the COMPASS running.

HiRadMat

B. Rae said that it was planned to send beam to the BTV2 experiment in week23 (subject to prior approval due to SPS dump limitations).

AWAKE

E. Gschwendtner sent an email with the following information: "We are continuing HW commissioning of the proton beam line of AWAKE. Depending on the length of the LHC TS1 we might be able to do only part of the tests of the switch magnets PC (between TI8 and AWAKE)."

LHC

M. Lamont said the LHC is now filled with more than 1800 bunches. Performances are very good despite of a quite long injection time.

Linac3

M. O'Neil reported the status of the Linac3 (Annex 2). The source ovens were refilled on Monday 23/05. Since then, the linac is running smoothly and delivering 30 uA beam to LEIR.

LEIR

D. Manglunki reported the progress of LEIR (Annex 7). YASP was successfully implemented for the injection line for trajectory corrections. A wrong frequency was being sent by the LLRF to BI, which explained the tune measurement errors. MDEARLY beam was generated in the LSA database and optimized. Few issues were found on some diagnostics: ETL.MSFV10 & ETL.MSFV30 inverted,

EI.BTV20 mirrored in H and ER.UEH43 pick-up is still to be checked. The beam will be back to LEIR in the afternoon after the Linac3 MD.

L. Soby commented that the pick-up ER.UEH43 had been checked in the morning and that its calibration looked fine.

CTF3

There was no report.

TI

J. Nielsen reported the few events which took place this week. There were 3 electrical perturbations on Saturday, Sunday and Monday.

3. Next technical stop activities

C. Mastrostefano presented the list of planned activities in the Linac2 and Linac3 (Annex 8 & Annex 9). Apart from usual inspections and visits, the Linac2 RFQ amplifier tube will be exchanged and the proton source high voltage column will be cleaned.

D. Hay presented the list of planned activities in the PS Booster (Annex 10). They are mainly usual inspections and visits. The longest intervention is estimated to 3 hours (replacement of Mu metal shielding on vacuum chamber in 4L1). **B. Mikulec** added that some equipment will be pulsed for testing at the end of the technical stop, so any intervention should be completed if possible by 3:00 PM.

S. Mataguez presented the list of planned activities in the PS (Annex 11). Many activities were performed last week. Except for an intervention to fix a water leak in the switchyard (MU41), all other activities could be reported. **B. Dehning** said they would be ready to install the PS BGI beginning of next week. **J. Ferreira** said that such an intervention would require more than 12 hours (up to 2 days if no night shift). **S. Deleval** added that this would also require cooling water connection. **B. Mikulec** said that this intervention could not take place in the next technical stop and will be postponed to the next occasion.

D. Mcfarlane presented the list of planned activities in the SPS (Annex 12). 40 impacts were transferred to last week during the PS stop. There are 35 requests remaining, which are mainly inspection and visits and no intervention will last more than 8 hours. He added that the repair of the water leak in BA6 will influence the SM18 cryogenics.

4. Schedule Updates

B. Mikulec presented the injector schedule V1.5 (Annex 13) and said the COLDEX run will depend on the decision on the injector technical stop day.

03:00 - Stop high-loss beams (SFTPRO, AD, nTOF, EastHall beams)

06:00 - Stop all remaining beams

08:30 – Start RP survey

09:30 – Access start

17:00 - Technical stop end

In the SPS the TS will be preceded by a 24h UA9 run and followed by a 24h COLDEX run. COLDEX will be moved IN during the SPS TS and moved OUT again in time to allow SPS restart at 17:00 on Wednesday 8th of June (this has been confirmed after the meeting).

5. AOB

There was no AOB.

Next Meeting: Tuesday 7th June 2016.

Minutes reported by JB. Lallement on 1st June

Summary of the 16th FOM Meeting

Held on Tuesday 7th June 2016

Agenda (https://indico.cern.ch/event/539351/)

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 last FOM were approved.

There were two open actions (Annex 1).

1. Concerning the SPS QF ripple, **X. Genillon** said that investigations were still on-going. A new sensor was installed on the voltage measurement to monitor the events. The action stays open.
2. Concerning the official wire scanner settings for the measurement of the transverse emittances in the injectors, **A. Guerrero** and **E. Piselli** are following this up. The action stays open.

2. Status of the machines

Linac2

JB. Lallement reported the status of the Linac2 (Annex 2). It was an excellent week without any fault.

PSB

E. Benedetto presented the status of the PS Booster (Annex 3). Very smooth operation and no major issues to report, until Sunday morning when the Wire Scanner in Ring4 vertical plane broke. The repair would require a stop of approximately 24h (including vacuum recovery). Many MDs took place and the OP beams (mainly MTE, BCMS and Isolde) were fine-tuned. The injection with new Linac2 RF settings (to reduce the power demand from the debuncher) has been checked for the key users and then the settings have been propagated to all the beams.

ISOLDE

J. Alberto Rodriguez reported the status of ISOLDE (Annex 4). A vacuum leak developed on the HRS target on Wednesday. It was then decided to switch IDS from HRS to GPS. Another leak was detected over the weekend on the GPS target. Answering to a question of **B. Mikulec**, there is no clear explanation why both targets developed a vacuum leak at almost the same time. It was noted that they both received a lot of integrated intensity.

ISOLDE Users

K. Johnston said that it went pretty well with HRS until the target leak. The IDS program is now completed. The GPS physics program will have to be completed next year.

PS

R. Steerenberg reported about the status of the PS (Annex 5). It was a very good week with 95% availability. The LHC 25ns - 48 bunch BCMS beam is ready from the PS with transverse emittances of around 1.4 mm.mrad. The intensity on MTE was increased to 1e13 ppp. The integrated intensity delivered to nTOF is currently 9% above the planned value despite the MPS/POPS failures.

East Area

L. Gatignon reported that the week was very smooth.

East Area Users

H. Wilkens reported that there was no user on the north branch over the last week. PANDA will take the beam until Friday. Next week the line will be set up for 'beam for school'.

nToF Users

D. Macina informed that due to accesses to EAR2, there will be no beam during daytime and beam over nights. Work on EAR2 could trigger alarms at the TI console due to pressure changes (during the whole week).

AD

C. Oliveira reported on the AD status (Annex 6)**.** Last week there were several minor issues with power supplies (DI.BHZ6045 at injection and DE0.QN10 at ejection). Saturday night, a team from CO came to replace a "white rabbit" switch and a timing delay module (8 hours downtime).

Commenting on the important downtime, **M. Gourber-Pace** said that a CO expert diagnosed the problem from home and then came to CERN. Two other experts joined him later to solve the problem, which proved to be very complex. She added that although there is no more CO piquet, the CO team was very reactive. **B. Mikulec** asked if the CO group could provide the correct link person for white

rabbit issues on the CO call-out list if such a problem would reoccur in the future. **M. Gourber-Pace** answered positively.

AD Users

H. Wilkens informed of the delayed restart of the BASE experiment, as they still have 10 anti-protons left from last year.

SPS

D. Manglunki reported the status of the SPS (Annex 6). The week was pretty smooth. For what concerns the NA, the intensity limitation was increased to 2e13 ppp on Tuesday and the beam is now also delivered during LHC fillings since the IEFC approval on Friday morning. The QF spikes resurfaced on Thursday. On Monday, from 3:00, a problem on the DC BCT acquisition caused all SFTPRO beams to be dumped at 400 GeV. No expert was available to solve the problem before 6:00, when the SFTPRO beam was stopped to start the 24h UA9 run. For UA9, the first half day was spent on finding the correct user and setting-up. Still running at low duty cycle (1 cycle per 48s). On Thursday morning at 6:30, an FEI interlock on MSE4183 prevented sending the beam to the LHC, although the power supply seemed to pulse normally. It turned out the fault was due to a wrong configuration of the new power supply in TT41 that was added the day before (~3h beam downtime).

North Area

L. Gatignon said that the DSO test initially scheduled on Thursday are cancel and postponed to a later date to be defined.

North Area Users

H. Wilkens reported that all test beams went fine. COMPASS has now completed its calibration and started the experiment.

HiRadMat

There was no report.

AWAKE

There was no report.

LHC

M. Lamont said it was a very good week for the LHC with 75% in stable beam and record luminosity until the quench on Monday.

Linac3

JB. Lallement reported that the Linac3 ran pretty well over the last week. The intensity dropped over the weekend. The ovens refill was ongoing.

LEIR

M-E. Angoletta reported on the LEIR status (Annex 7). A very good week with 100% availability. Beam was extracted to PS (as-is for the moment). YASP was used to measure the kick response in the ring. The chromaticity measurement system is back into operation and first chromaticity was measured. The settings were corrected for the LEIR extraction transformers (now beam can be seen in EE and ETP).

CTF3

P. Skowronski reported on the CTF3 status (Annex 8). It was a good week in CTF3. The Delay Loop optics tuning took place from Monday to Wednesday. A 14.5 A beam was delivered for TBM from Wednesday to Friday and beam was sent for the dogleg experiment at the middle of the DB linac over the weekend. The orbit jitter in horizontal, originating in DL, investigations are still on-going. An access in CLEX was needed on Wednesday to fix the MTV screen in CALIFES that got stuck after the power cut. A fault on the klystron MKS12 stopped the beam for approximately 6h last Monday. **P. Skowronski** also acknowledged Valentine Fedosseev for the gun laser support during the absence of the laser operations team.

TI

J. Nielsen reported that it was a pretty quiet week.

3. Schedule updates

B. Mikulec presented the latest version of the injector schedule v1.6 (Annex 9). The non-urgent interventions longer than 8 hours would have to take place during the September technical stop or the EYETS. Given the time it usually takes for COLDEX insertion/extraction (Annex 10), **B. Mikulec** proposed to reduce the duration planned for the extraction before 17:00 from 2 to 1.5 hours, which was accepted. **S. Deleval** said despite the special arrangements put in place to provide cooling for COLDEX during the BA6 water leak repair, the cryogenics of COLDEX tripped. They were investigating a blockage in the cooling circuit, but if the problem could not be solved rapidly, the COLDEX run might need to be postponed.

V. Kain said HiRaMat could already take the beam this week. Conditions have to be discussed with the SPS operation and EN/STI for the beam dump considerations.

4. AOB

There was no AOB.

Next Meeting: Tuesday 14th June 2016.

Minutes reported by JB. Lallement on 8th June

Summary of the 17th FOM Meeting

Held on Tuesday 14th June 2016

Agenda (https://indico.cern.ch/event/541787/)

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 last FOM were approved.

There were two open actions (Annex 1).

1. **Concerning the SPS QF ripple:**
   C. Mugnier said that he gave a presentation during the last IEFC on the topic. Possibly the problem is related to a cable that was in use in the past and was disconnected only on the power supply side. It should be disconnected also in the tunnel.
   Q. K. Cornelis asked about a time estimate for this intervention.
   A. It needs access to the machine, therefore 2-3 hours will be needed.
   Eventually extra measurements in both tunnel halves should be performed.
   The action stays open
2. **Concerning the official wire scanner settings for the measurement of the transverse emittances in the injectors:**
   A. Guerrero Ollacarizqueta commented that it was still ongoing.
   The action stays open
3. White rabbit timing switches: **M. Gourber-Pace** reported that new procedures were introduced within BE-CO after the problem with AD reported last week, including the names of the specialists to contact in case of an issue. The white rabbit front-ends were also added to DIAMON, again with the names of responsible persons attached.
   Q. R. Steerenberg asked if it was done also for the PS B-train.
   A. Yes.

2. Status of the machines

Linac2

J.-B. Lallement reported the status of the Linac2 (Annex 2).

There were 2 main faults:

- Glitch on Wednesday provoked 30 minutes downtime. Few RFQ trips during the following night. Couple of stops during the week, weekend very calm.
- The source is conditioning and intensity slowly recovering after the technical stop (now 150 mA at the end of the linac).
- After the cleaning of the HV column during the TS, the source flash-over rate returned to normal.

PSB

K. Hanke presented the status of the PS Booster (Annex 3).

Eventful restart after the technical stop: Issues with septa, cavities, injection kickers; only at 10pm restarted the beam. Many teams involved.

Throughout Wednesday perturbations from Linac 2.

Thursday: Scheduled stop instead of 1 minute took 40 minutes. The specialist did not call back the control room to confirm that the intervention was completed. LL RF firmware upgrade, that should in principle happen in the shadow, was not transparent. As a consequence, tuning of longitudinal beam parameters had to be redone one by one.

Otherwise relatively OK.

ISOLDE

M. Lozano Benito reported the status of ISOLDE (Annex 4).

Friday afternoon 5h of stop. First a vacuum glitch was reported, all seemed OK, but the users claimed that there was no beam out of the target. All controls looked fine. The target was verified to be cold, and the controls kept reporting it hot. It turned out that the HV platform was completely off. No elements were present on the alarm list. Restarted the FEC without problem. The responsible piquet was called to diagnose the issue with the controls. It was not possible to connect remotely and the specialist did not know where to find the firmware software to be loaded into the PLC hardware. Finally OP managed to restart it after 1h of attempts. TIMBER was reporting the values correctly.

M. Gourber Pace commented that this hardware was under EPC supervision, and most probably it was the EPC-CO piquet who was contacted and is the responsible, not the BE-CO one.

Q. B. Mikulec: Is it really the case that the source of the firmware software is unknown?

A. C. Mugnier answered that this has to be verified. There were many persons involved in the intervention, and it should be followed up in a dedicated meeting with all the involved people present. Still, the Working Sets should show the status correctly.

M. Gourber-Pace added that the FESA class is also under the EPC responsibility.

M. Dudek being the expert of these systems needs to be contacted for more details and to clarify the situation.

ISOLDE Users

K. Johnston reported that when the conditions were stable, the beam quality was good and good measurements could be performed even though there were some hick-ups because the target didn't produce the desired 135In isotope.

PS

A. Guerrero Ollacarizqueta reported the status of the PS (Annex 5).

Recovery from the technical stop was not without problems. The injection kicker KFA45 had to go through the night with one module out of service since the specialist could not be reached. To avoid frequent trips the supercycle was lightened (1EAST and 1 TOF removed). Beam was finally back around midnight.

No beam during ½ hour Wednesday morning due to a cooling issue on C46 and 1h was lost due to a power glitch during the night. The SFTPRO beam was down for 40 minutes on Thursday due to a power supply issue on KFA21. Another 40 minutes were lost on Sunday, as TT2 went into fall-back mode due to radiation. The most likely reason being beam lost in the AD ring.

During the TS works and upgrades were done as expected. In particular, new BLM monitors were installed in periods 15 and 16 in preparation of the RP MD to commission the efficiency of the shadowing for the MTE beam. Later in the week the high intensity MTE beam was prepared.

LHC25 5BP cycle setup continued and the cycle was played in the supercycle as ZERO. During the week work on the EARLY ion beam resumed. The coarse longitudinal setup was done.

Kicks for satellite cleaning were tuned and upon request of the LHC the 2nd kick was introduced in the cycle.

Answering to a question of **V. Kain**, **R. Steerenberg** explained that the kick was introduced after triple splitting to remove the satellites. They were off for some reason and the LHC requested tuning because it was found that at injection BLM signals are at 40% of the dump threshold.

East Area

Bastian Rae: The East Area was running fine throughout the week.

East Area Users

H. Wilkens reported that there was no user on the North branch during the last week. All cycles went to the irradiation facility.

nToF

E. Chiaveri said that there were changes being implemented for the vertical beam setup. A new detector is under construction, so the beam is delivered only during nights. There will be a request for some beam during daytime tomorrow to test the new detector.

AD

B. Dupuy reported on the AD status (Annex 6)**.**

The extraction intensity was around 3.2E7 antiprotons, and the bunch length is nominal at 130 ns.

Tuesday during the technical stop, there were lots of accesses into the ring for:

- Refilling cryogenic cooler on MCC transformer.
- Intervention by BE-BI on future Q measurement on ramps.
- Vacuum survey on equipment by specialists.
- Noise detection on injection transformer FTA.BCT9053.

Since Saturday night the cavity C02 trips at the highest frequency flattop and restarts few cycles later (automatically). Despite the intervention of the RF specialist (M. Haase) during the weekend, this problem continued to appear randomly. Finally, this issue was related to a faulty HF relay board, but as there is no spare it is not completely resolved yet. Since the actions on Sunday afternoon, the cuts are less frequent.

The beam stopper was down due to installations in the ELENA area.

Q. F. Pirotte asked what type of ELENA work provoked this issue.

A. Due to a bad manipulation with the access system, the target zone tripped, for which the regular restart takes 40 min.

AD Users

H. Wilkens informed that only ATRAP and ASACUSA were taking beam, as BASE still needs to be refilled.

SPS

K. Cornelis reported the status of the SPS (Annex 6). The availability returned to normal since there is no more downtime for the North Area during LHC fillings.

Busy week.

- The COLDEX could not take place because their cryogenics could not recover in time, so fixed target physics was tried to be resumed. Due to problems in the PSB and the PS the beam could only be delivered around midnight.
- Wednesday: BCT problematic after the Technical Stop. Luckily LHC didn't have to be filled because it would have been a show stopper.
- On Thursday and Friday setting up LHC4 cycle (short flat bottom), but it was not well injected due to problems with the BQM once locked to the LHC frequency. It will be retried after the weekend when specialists are present.
- The bunch to bucket transfer was optimized by the PS and SPS RF specialists, reducing the losses on the LHC25nsec cycle from 12% to 7%.
- Thursday evening there was an issue in the North Area cooling tower (NA62). As a leftover from the technical stop in the North Area there were many power converters off.
- No beam to NA62 during the whole weekend due to a problem on the NR22_039 power converter. It could not be solved during the weekend, and on Monday it was exchanged.

North Area

B. Rae said that 2 hours of beam time was lost due to the bad configuration of a quad. Otherwise he had nothing to add to the SPS report.

North Area Users

H. Wilkens reported that it was a good week for the NA users. COMPASS completed commissioning and started the data taking. NA62 is still not running.

HiRadMat

There was no report.

AWAKE

The report from **C. Bracco** report was received by email. 'The hardware commissioning of the proton beam line was completed last week with the exception of the heat run of the main dipoles. For this test we need the LHC in access mode and we would have needed 24 more hours ==> postponed to next TS. Still, since the new software for the control of the main switches was released and fully validated by OP, we are allowed to power the line for ~2 hours. We will try to extract the beam to the end of the line this week (either Thursday or Friday) to make a preliminary check of the optics and diagnostics (in particular new BPM electronics) and to discard/identify issues which could further delay the proton beam commissioning. From next week onwards we will move back to an installation period.'

LHC

R. Steerenberg: Smooth, good week and restart from the Technical Stop. Rocky Sunday night. 2 very good fills with 0.4 fb^{-1}. Achieved 95% of instant luminosity even with smaller than nominal number of bunches.

Comment from **K. Cornelis**: It is a pity trying to optimize too much the luminosity, as several fills were dumped during this process.

Linac3

Report from **JB. Lallement** (Annex 2) Pretty good week. Ovens were refilled on Tuesday during the technical stop. Good intensity until Sunday (30 uA at the end of the Linac). Ovens to be refilled next Friday or Monday, to be agreed with LEIR.

LEIR

D Manglunki reported for **J. Axensalva** (Annex 7):

It was a short week (technical stop & Linac3 MD) for LEIR, but nevertheless active:

- Linac3 source refill & technical stop: Some upgrades were performed during the technical stop: FESA3 class now managing the RF power, hardware maintenance on power converters (MCB, emergency switch, WIC), etc.
- The EARLY beam was sent to the PS where it was circulating.
- Fixed the ejection pickups reading trouble in YASP.
- Together with BI, prepared the specifications for a new Schottky measurement system, which should replace the Windows-based Keysight spectrum analyzers.
- Suffered from a noisy signal on the BCT ring since Wednesday and the repair was done by Friday noon.
- The old electronics to the SMH11 injection septum is giving some troubles, but it was possible to keep the beam injected (the electronics does not work in remote, to be fixed next week).
- Also a Quad (ITE.QFN01) gave some troubles Friday (3 interventions of PIPO who finally exchanged the electronics power supply)
- Successfully created new cycles and more and more confident with LSA now (re)fitted on LEIR.
- Some measurements and preparations were done on the MD multiple injections beam.
- Many time slots were dedicated to the Transverse Feedback recommissioning & tests of the upgraded system, but unfortunately some works have still to be done beginning of this week. This is now on the critical path to be able to set up the multiple injections NOMINAL-type beams.
- As planned, there was no support for LEIR & Linac3 during this weekend and the LINAC3 degraded during Saturday night, thus no beam in LEIR this Sunday.

The next high priority tasks are: Transverse Feedback completion and the continuation of the installation of the new RF low level.
Q. B. Mikulec: Are there any actions needed for the Transverse FB?

A. No, the expert is working on this.

There were also some diagnostic issues when some tanks were off, and the control system showed that all was OK.

Comment from **M. Gourber-Pace**: Again these classes are not provided by BE-CO; there should be some follow-up from the concerned equipment specialist.

Q. L. Soby: What was the problem with the injection pickups?

A. V. Kain: It was problem after the intervention during the technical stop. The names in MADX did not correspond to the equipment names and also some positions were off.

CTF3

P. Skowronski for **F. Tecker:** There were several issues encountered during the week.

- Wed 21:00 power glitch => lost night run + few hours
- CALIFES laser problem: Low output power => beam intensity 5x below nominal. The laser company expert is only available on 22.6., and repair would lead to more than 2 months total downtime. To provide an alternative laser system setup will take around 1 week, therefore this is the preferred solution.
- AWAKE BPM tests on 20.-24.6. Beam intensity cannot be guaranteed due to the above mentioned laser problem.
- DL septa power supply: pk-pk 4x10^-4 stability is on the limit of what can be tolerated; still investigating with experts if it could be improved.

Drive beam was used for beam studies in the Delay Loop.

Successful Dogleg run on the week-end.

TI

J. Nielsen: (Annex 8) Quite busy, 400 calls, including the creation of 8 major events.

- Tuesday 07/06 @ 5:40 electrical perturbation, CERN-wide. No big impact since most of the machines were in preparation for the technical stop.
- Wednesday beam loss due to electrical perturbation causing a fault on Linac 2. PS and Booster tripped. Cooling station of NA62 restarted by TI. Confirmed by RTE as a short circuit on the 400kV line FRASNE GENISSIAT.
- Issues with the North Area cooling circuits on Thursday and Friday.

S. Deleval commented that the the problem with the NA cooling circuit was due to a faulty sensor, but that the sensor was not changed because it would mean emptying the tank, what is very time-consuming. Therefore, a parallel cable was pulled and another device used in place.
He also added that the cause for the COMPASS cooling failure is not yet understood.

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule.

4. AOB

1. Linac 2 access system intervention in Linac2: **D. Chapuis** said that a 2 h intervention is needed due to a problem with the access PC. **H. Vincke** confirmed that it can be done during operation, but the time spent close to the access door area should be minimised. The intervention was approved.
2. LEIR doors: **D. Chapuis** said that intervention was scheduled from Wednesday until Thursday. Answering to a question, **B. Mikulec** answered that this intervention will not perturb operation. The only consequence is that it would take longer to access the machines in case it would be needed during the intervention period. The intervention was approved.
3. **X. Genillon** explained that POPS checks every 3 weeks are needed because in the degraded mode there is more load on the output filter capacitors. Therefore these capacitors need to be checked regularly, and eventually be exchanged. The eventual exchanges will be done within the 2h of the intervention.
   B. Mikulec commented that for the scheduling LHC filling periods have to be avoided. The next preventive intervention is needed for week 26. Tentatively Thursday morning is agreed and it will be confirmed during the FOM of week 26.

Next Meeting: Tuesday 21st June 2016.

Minutes reported by P.K. Skowronski on 15th June

Summary of the 18th FOM Meeting

Held on Tuesday 21st June 2016

Agenda (https://indico.cern.ch/event/544227/)

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 last FOM were approved.

There were two open actions (Annex 1).

1. Concerning the SPS QF ripple, **C. Mugnier** said that investigations were still on-going and that they recorded an event during the last week. They are now investigating together with TE-MSC. The action stays open.
2. There was no update concerning the official wire scanner settings for the measurement of the transverse emittances in the injectors. The action stays open.

2. Status of the machines

Linac2

G. Bellodi reported the status of the Linac2 (Annex 2). The week was dominated by RF issues and the major downtime was due to the replacement of the RF reference line amplifier on the night from Friday to Saturday. The RF team put a temporary solution in place that would be replaced with a definitive one today. The source current was slowly recovering from a vacuum flashover that occurred on Friday.

PSB

E. Benedetto presented the status of the PS Booster (Annex 3). Very quiet operation for the PSB this week. In the second part of the week the current from the source decreased, which is normal since ISOLDE has not been taking beam for a few days. During the weekend however, after the Linac2 RF

issue, the source current decreased even more, especially for Rings 2,1 (in the tail of the pulse), requiring readjustment of the LHC beams (injection of ~3 turns instead of ~2) and entailed slightly larger emittances compared to what is normally delivered. All measures were put in place to train the source, and the situation is slowly improving. There was significant progress in the validation/debugging of the new Turn-by-Turn pick-up electronics, presently available on only 3 BPMs on Ring2.

Concerning the issue related to the BT2.KFA20 kicker, **M. Hourican** said that they would put in place a voltage regulation and that this would require a 1 hour stop (possibly in the afternoon in case of a Linac2 stop for the reference line amplifier).

ISOLDE

E. Siesling reported the status of ISOLDE (Annex 4). Concerning HRS, a leak on the target prevented the users to run over a long period with full proton intensity. Despite this the run was still successful. The run stopped on Thursday for the change to GPS for negative ions. The next HRS target change is foreseen tomorrow. On the GPS side, the week was devoted to the preparations of the negative ion run. The negative ion target was mounted on the GPS front-end on Thursday morning and stable Iodine beam was sent to the users later on that day. Users obtained successful results over the weekend. The run will last until Wednesday when polarities will be swapped back to normal. The target change is foreseen next week.

ISOLDE Users

K. Johnston said that on the HRS side, since Tuesday last week the target developed a leak and the physics users had to give up after about 16 hours of beam. Till then the yields had been promising, but the physics program could not be finished in the end due to the leak. On the GPS side, the switchover to negative beams was mostly for beam development of halogen beams (Cl, I, Br) and a letter of intent (LOI) to explore the chemistry of At, in particular to determine the electron affinity. These beams are never easy, but after a lot of re-tuning over the weekend, the LOI was able to get the first signal following photo detachment of I and At beams. This is promising for an already accepted experiment which will use these beams for a longer period next year.

PS

M. Fraser reported about the status of the PS (Annex 5). It was a steady week for the PS with most of the downtime caused by injector problems. Minor issues in the PS included a few kicker and cavity trips, and an RP monitor tripping TT2, which was probably caused by bad MTE spills. A variety of LHC beams were provided for tests and commissioning: probe bunches were provided for AWAKE commissioning and 80 bunch and 48 bunch LHC25 (nominal, i.e. not BCMS) beams were delivered to the SPS for injection tests with trains of up to 2 batches. A first RF setup of the LHC ion cycle (EARLY) was carried out and work continued on the LHC25 BCMS beam. The calibration of the RP monitor at the target will take place today at 2:00 PM.

M. Hourican commented that any change to the kicker settings should be communicated to the kicker specialists to speed up potential interventions.

East Area

B. Rae said there was nothing special to report. **L. Gatignon** will not be at CERN until 12th of July.

East Area Users

There was no report.

nToF Users

D. Macina said that everything went well and they were now back to nominal operation (data taking during the day time). The detector change is postponed.

AD

L, Joergensen reported on the AD status (Annex 6). It was a very good and stable week. Only ATRAP and ASACUSA took the beam. During the night between Saturday and Sunday one of the modules in the injection kicker went in fault. This seemed to be resettable, but the AD was behaving strangely. After a long intervention on Sunday, it turned out that the thyratron switch was broken. The other modules should have been able to compensate for the loss of one module, but it also turned out that there was a bug in the software for the automatic re-balancing of the load. The bug was fixed by the intervention of **A. Antoine**. The switch will have to be replaced in the coming days. Otherwise the AD delivered about 3.2E7 anti-protons per shot this week.

AD Users

There was no report.

SPS

V. Kain reported the status of the SPS (Annex 7). It was a pretty good week especially for the fixed target beams as they are now run in parallel to LHC fills. Main downtime was due to injectors. First beam was sent to AWAKE. The LHC is now filled with the LHC4 cycle with the shorter flat bottom with only two injections. Apart from being shorter and the potential reduction of the filling time, it also has beneficial effects on beam quality. Transmission is better and the uncaptured beam populates less of the SPS circumference. The LHC beams seem to occasionally suffer from fast debunching, the origin of which is not understood yet. Before the weekend the SPS took two times 48 bunches, standard beam, with 250 ns spacing. The beam looks good (~ 2.5 um emittance along the entire bunch train). It was not accelerated yet because of the beam dump limitations. The 40th birthday of the SPS was celebrated in the night from Friday to Saturday.

B. Mikulec asked what the next steps for the intensity ramp-up were. **V. Kain** answered that the next step is to try 2 x 48 bunches with 25 standard beams and then eventually BCMS beam with the same number of bunches but with blown-up emittance. **M. Lamont** added that it all depends on the TIDVG vacuum evolution. A decision will be taken tomorrow or on Thursday.

North Area

B. Rae said it was a good week. Dynamic Economy will be applied to all magnet power circuits tomorrow, during the MDs.

North Area Users

There was no report.

HiRadMat

B. Rae said that the next beam time is scheduled in August, with low intensity (1 bunch).

AWAKE

There was no report.

LHC

M. Lamont said the week was very good also for the LHC. The last fill was kept in stable beam for more than 29 hours and an integrated luminosity of 560 pb^{-1}.

Linac3

G. Bellodi reported the status of the Linac3 (Annex 2). It was a good week with 30-32 uA ion beam at the end of the Linac during daytime, but during the nights the current usually dropped, and the source had to be retuned the next morning. A short circuit was found and fixed on the source oven1 during the refill yesterday. The beam is expected to be available to LEIR before noon.

LEIR

S. Pasinelli reported on the LEIR status (Annex 8). Up to 3 turns were injected in the machine. After several electronic faults, the SMH11 power supply was changed yesterday. The tests on the new LLRF were postponed.

CTF3

There was no report.

TI

R. Ledru reported that the week was very quiet. Only small electric perturbations occurred on Saturday and Sunday.

3. Schedule updates

B. Mikulec presented the latest version of the injector schedule v1.6 (Annex 9). The 3 hours stop for the POPS regular checks has to be scheduled next week.

H. Bartosik said that there will be a dedicated MD in the SPS but it should be compatible with the NA beam production.

4. AOB

There was no AOB.

Next Meeting: Tuesday 28th June 2016.

Minutes reported by JB. Lallement on 22nd June

Summary of the 19th FOM Meeting

Held on Tuesday 28th June 2016

Agenda (https://indico.cern.ch/event/546092/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *AOB*

B. Mikulec chaired the meeting.

The list of presence can be found in Annex 0.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.

There were 2 open actions (Annex 1),

1. Concerning the SPS QF ripple there was no additional news. The action stays open.
2. There was no update concerning the official wire scanner settings for the measurement of the transverse emittances in the injectors. The action stays open.

2. Status of the machines

Linac2

D. Kuechler for J.-B. Lallement reported the status of the Linac2 (Annex 2).

Tuesday afternoon the replacement of the RF reference line amplifier took 50 minutes.

Linac2 was back 1h20min after the 400kV trip on Friday afternoon.

D. Kuechler also reported that investigations were ongoing on the pulse shape of the source.

Comment from B.Mikulec: The Linac2 pulse shape change resulted in higher beam emittance in the LHC for bunches coming from PSB ring 1 during the last days.

PSB

J.-F. Comblin presented the status of the PS Booster (Annex 3).

PSB suffered from 2 problems:

- Friday at 4 AM, the distributor of ring 2 tripped. The specialist changed a thyratron, but at 11AM it tripped again. The specialist did not find the problem when the LHC was about to be filled, so it had to be reset every 2 minutes. Then the 400 kV problem occurred, and the specialist found bad contacts in connectors. To be followed-up as it tripped again on Sunday. Total downtime of 3h20, plus 3h20 of degraded beams.
- During the whole week, there is an occasional dip in the pulse coming from Linac2. This reduces the intensity for ring 1. To solve this issue more intensity is injected in that ring, meaning the transverse emittance is increased. Source specialists need to investigate.

For the PSB, the total downtime for the 400 kV problem was 6 hours. The machine restarted 25 minutes after the green light of TI.

Managed to increase the intensity of ISOLDE beam up to 3.6E13. Some fine-tuning of the extraction trajectories were needed to reduce a bit the losses.

Comment from E. Matli: ISOLDE had to redo the steering on target after the changes resulting in an intensity increase in the PSB. Every time the target is replaced a proton scan needs to be redone, so it would be the most convenient to introduce any beam changes at these occasions. However, it was not a very lengthy procedure, but it should be communicated to the ISOLDE supervisor in charge.

B. Mikulec: Already reminded the PSB team to inform ISOLDE about any steering changes so they can re-steer on their side on the spot.

ISOLDE

E. Matli reported the status of ISOLDE (Annex 4).

Bumpy week with lots of changes to the planning.

Tuesday end of the negative ions run extended through the night.

Wednesday morning stop protons on GPS and switch back to positive charges, completed in the early afternoon. In parallel it was planned to replace the target on HRS, but it was postponed due to a problem with a motor of the robot. A plug target was installed on GPS to reduce the ambient dose during the planned intervention to fix the robots, but the solution seemed more complicated than initially foreseen.

Thursday an old target was installed on GPS to allow some physics during the w/e.

Setting up was complete on Friday when operation was interrupted by the 400kV problem. The target was most probably destroyed by fast cool-down.

At the same time the robot was fixed and a new target was installed on HRS.

The target was heated up overnight and setup was performed on Saturday.

Short intervention was needed on Sunday to correct the steering on target due to adjustments on the BTY line to reduce losses.

The issue with unreliable temperature controls of the target system appeared again. Apparently a PLC badly reported to FESA. After the power glitch the PLC was not restarted correctly, as the date on the front display indicated year 2014.

C. Mugnier commented that there will be a meeting concerning this subject tomorrow (June 29). M. Dudek is preparing a software update that should be implemented within the next months (tbc).

ISOLDE Users

K. Johnston (report received by email)

'From the users side it hasn't been a straightforward week, which Emanuele will tell during his presentation. The problem with the HRS robot and then the 400kV cut on Friday meant that the physics run only started properly on Sunday instead of Friday evening. Nonetheless, since then the beam has been very good and the users are collecting good data on Bi isotopes from the HRS.

A very special thanks go to Emanuele for all his efforts on Friday evening and into the weekend to bring the machine back into shape – stable setup and proton scan etc – once the problems had been sorted out. There was the problem with the proton steering on Sunday afternoon, which I believe was due to some "tweaking" of the proton line to ISOLDE. If this could be communicated to the ISOLDE engineer in charge before it takes place it would be helpful. A couple of hours were lost correcting this.

For this week we will take STAGISO on GPS (in parallel to running with NORMHRS). The timing of the bunches should be with a 16us distance and the intensity will start at 6e12 protons per pulse. This may increase to 8e12 (the maximum) but we will start with 6e12 to preserve the target that bit longer.'

PS

D. Cotte reported the status of the PS (Annex 5).

PS was affected by the electrical glitch on Friday afternoon. Multiple piquets had to intervene; the beam was re-established only around 2.30AM on Saturday.

TT2 trips due to radiation alarm (PAXPT113) being investigated. It seems to be related to C91 (10 MHz) not pulsing leading to bad MTE extraction.

n-TOF RP monitor calibration (PMIBL02) done on Tuesday.

Mitigated the emittance blow-up at injection of high intensity LHCINDIV bunches.

Made available transversely blown-up BCMS beams, so the final emittance can be increased if needed.

East Area

G. Manglunki: Nothing to mention.

East Area Users

H. Wilkens: All fine.

nToF

D. Macina: All good.

AD

L. Bojtar reported on the AD status (Annex 6)**.**

Tuesday and Wednesday there was a problem with the injection kicker causing radiation alarms in the hall. The problem has been fixed, it is stable now.

Wednesday evening there was an intervention due to the C02 cavity, which didn't deliver any voltage, but on the control system no fault was indicated. After a while the voltage appeared again. The specialists are aware of the problem.

Friday many systems tripped due to the general power cut.

AD Users

H. Wilkens: All was fine. This week 3 experiments will run: ASACUSA, AEGiS and ALPHA.

SPS

H. Bartosik reported the status of the SPS (Annex 6).

Week 25 was devoted to North Area physics production, LHC beam delivery and a series of machine studies on the high bandwidth feedback system with colleagues from the LARP collaboration.

Since the end of last week the cycle with the sort flat bottom is used for LHC filling. The fast de-bunching of the LHC beam observed occasionally in the last weeks could be resolved by the RF expert by replacing the 500 MHz frequency reference card.

The LHC also observed ghost bunches after the second batch, caused by re-captured beam at SPS acceleration. Some improvement was made by reducing the longitudinal emittance at SPS injection. Using the tune kicker for cleaning these ghosts at low energy in the SPS was not yet successful.

The BCMS beam was tested in the SPS. It has transverse emittances of about 1.6 um for 1.15e11 p/b at extraction. As confirmed in the SPS, the PS can reliably perform controlled transverse emittance blow-up using the transverse feedback system, in case requested by the LHC.

Progress was also made on the fixed target beam. The occasional beam dumps triggered by losses in T20 during the slow extraction due to an increased horizontal beam size could be traced back to a horizontal instability during the ramp. Beam stability was improved by increasing the octupole strength.

Since Wednesday evening the supercycle duration is reduced from 34 to 28 basic periods to improve the duty cycle for the North Area. However, the LHC cycle and its ramp to 450 GeV seems to have a larger impact on the spill quality. Sometimes the fixed target had to be switched off during LHC filling and LHC beam preparation, which is reflected in the beam availability.

The 65 Hz hump in the spill is still present.

During the dedicated MD on Wednesday a vertical coupled bunch instability of a single batch of the 25 ns beam could be stabilised with the prototype high bandwidth feedback system in multi bunch mode.

Q: H.Vincke What is the intensity delivered to the North Area?

A: The intensity is still limited to 2e13 p.

North Area

D. Manglunki, who reported for B. Rae, said that they are changing the wobbling and that everyone was busy with this activity.

North Area Users

H. Wilkens reported that the increase of the duty cycle is very much appreciated by the users. COMPASS can now hope to receive 1/3 of the expected amount of protons on target while it was just above 1/4 previous to the change.

COMPASS suffered from a water leak, fire brigade intervened.

Q from **H. Vincke:** Is the internal dump happy?

A: H.Barosik Yes, pressure is at 1.7e-7, constant.

HiRadMat

There was no report.

AWAKE

No report .

LHC

M. Lamont: Not bad, lower emittances. Yesterday a 27h fill delivered very good luminosity (design luminosity!).

Q: B.Mikulec When are you going to switch to BCMS?

A: At least one more week with the current setting.

Linac3

D. Kuchler for **J.-B. Lallement** (Annex 2).

A short circuit was found on one oven filament during the oven refill on Monday. Beam was available to LEIR on Tuesday morning.

LEIR

M.E. Angoletta: (Annex 7)

B. Mikulec congratulated the LEIR team for the record beam intensity.

Q: Is this the beam that will be used for physics?

A: D. Manglunki Yes

Q: B. Mikulec For the PS was there any heads-up message concerning the ion beam commissioning.

A: D. Manglunki Yes, yesterday we started sending the NOMINAL beam to PS to be able to start with the RF gymnastics.

PS Ions

D. Manglunki: TE/VSC would like to decrease the frequency of (otherwise daily) sublimations in certain regions of the PS to save titanium. We will need one special low energy cycle for lifetime measurements to validate this.

D. Cotte: There is currently an issue with YASP, but they will prepare a new cycle as soon as possible.

CTF3

P. Skowronski for **T.Persson** (Annex 8)

TI

M. Lamont for J. Nielsen:

Main issue was the 400kV glitch on Friday afternoon.

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule. There were no modifications since the previous meeting.

4. AOB

1. Booster door intervention from tomorrow until Friday, in case any access is needed, it will take longer than usual. **Approved.**
2. PS 3h stop for checks of output filter capacitors of the POPS. **Approved Thursday, June 30, from 8h to 11h.** Starting time could be delayed depending on the LHC filling.
   Q: L. Soby Will there be a possibility for other accesses at this time to PSB?
   A: D. Cotte No, because ISOLDE is running, but accesses might be granted for the PS ring (except for the Switchyard).

Next Meeting: Tuesday 5th July 2016.

Minutes reported by P.K. Skowronski on 30th June

Summary of the 19th FOM Meeting

Held on Tuesday 5th July 2016

Agenda (https://indico.cern.ch/event/547129/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *AOB*

B. Mikulec chaired the meeting.

The list of presence can be found in Annex 0.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.

There were 2 open actions (Annex 1),

1. Concerning the SPS QF ripple there is no conclusion yet.

   C. Mugnier said that more and more information becomes available from different sources and measurements. The presence of the ripple is clearly visible, but its source is still not determined. For example, there are some time patterns: many events occur between 2 AM and 3 AM, other times nothing happens. Still the effect is quite small, 2A out of 2000A of the current at flat-top.
   The action stays open.

2. There was no update from BI concerning the official wire scanner settings for the measurement of the transverse emittances in the injectors.

   B. Mikulec mentioned that **A. Guerrero** had circulated a first document, but it is for one beam intensity only for the PS.
   The action stays open.

2. Status of the machines

Linac2

D. Kuechler reported the status of the Linac2 (Annex 2).

99% uptime. The beam quality is OK since the removal of the current boost module in the arc supply last Monday. 75 min downtime in the night to Thursday due to the power glitch.

PSB

A. Findlay presented the status of the PS Booster (Annex 3).

A good, quiet week for the PSB. There was the electrical glitch early Thursday morning that took down the complex, but the PSB team had the machine back up after 3 hours. Otherwise, there have been multiple MDs, and beam preparations have been ongoing all week, notably for the 1.5eVs BCMS.

Observed occasional orbit drifts for ISOLDE beams that after a few cycles return to the nominal.

ISOLDE

E. Fadakis for ISOLDE (Annex 4).

Very good week both for GPS and HRS with 97% availability.

ISOLDE Users

K. Johnston for ISOLDE users (report received by email)

'From the users side, there was a very successful run on Bi isotopes on HRS which just finished yesterday. This used many different setups at ISOLDE (ISOLTRAP, RILIS and the visiting windmill station) and worked very well over a quite long run. On the GPS side, it wasn't so successful, although the beam was good, the users had a problem with their chamber which developed some leaks just after starting. This compromised the programme to quite a degree, although they were able to make some experiments with 199Hg over the weekend.

This week there will be some test runs of B beams for REX operation and a laser spectroscopy run will start on Thursday for neutron-rich Sn isotopes on the HRS.'

PS

R. Steerenberg reported the status of the PS (Annex 5).

The electric glitch was the main issue of the past week.

Since the reduction of the duty cycle from 34 to 28 with 5 EAST cycles inside, the magnetic septum is at 97% of allowed RMS current, what makes it unstable sometimes, leading to frequent trips. Tried to shorten the pulse length of the septum to reduce heating.

A special cycle for measuring the ion beam lifetime was implemented.

Next priority is 4 bunch operation for LEIR beams.

nTOF accumulated 47% of target integrated intensity.

The intervention on POPS capacitor maintenance was done and all were tested OK except for one that might be replaced during the next TS. Next check can be in more than 3 weeks.

Q. B. Mikulec: Do you know when approximately the next intervention should be done?

A: No. Capacitors are planned to be exchanged to a different type later this year, after which checks will be less frequent. EPC or PS will try to obtain the information for the next FOM when the next maintenance period should take place.

Comment from S. Deleval: Concerning the cooling plant issue, the motor of the ventilator at the top of the cooling tower was exchanged. The motor of the second ventilator should also be exchanged as soon as possible. If done on a cooler day operation of the PS should be possible without interruption. He will contact the PS once he will identify a good moment.

Comment from **C. Mugnier**: The rotating machine is again available to be put back in service, if needed.

East Area

B. Rae: Quite good week, nothing special to mention.

East Area Users

H. Wilkens: Happy users.

nToF

D. Macina: More or less fine.
They were many accesses due little problems with the detector and the ongoing EAR1 calibration campaign. Because of this the integrated intensity did not grow as fast as usual.

AD

B. Dupuy reported on the AD status (Annex 6)**.**

No serious issue to mention.

The extraction intensity was around 3.0E7 antiprotons, and the bunch length is nominal at 130 ns.

Monday ADE-MD 7H-15H.

Refilling cryogenic cooler on CCC transformers. The refill of the CCC didn't go well, they could not cool it down afterwards. It is heating up now and can't measure the beam current.

There was a problem with the variation of the extracted bunch intensity and bad longitudinal position. It was fixed by a discerning adjustment on the RF offset on FT4B, RMP9 & FTSP3.

A new steering of the ALPHA line was done on Wednesday. Since the ATRAP magnetic background was changed the orbit was not stable.

Thursday electric glitch at 3H39. Many devices were affected, notably the Electron Cooler filament was off. After 6h00 of filament formation by the specialists, the beam was back at 13H30.

AD Users

H. Wilkens: No special concern from the users.

SPS

D. Manglunki reported the status of the SPS (Annex 6).

Considering it is still running in degraded mode because of the vacuum leak on TIDVG, this was a pretty good week for the SPS, with 88.5% availability for SFTPRO and 90.4% for the LHC, and most down time due to the injectors or external causes (EDF glitch). The LHC is currently filled with trains of 2x48 bunches (25ns spacing). On SFTPRO, the spikes on QF are still a concern. On Monday 27/6, it was confirmed that the amplitude of the satellite bunches observed by the LHC is of the order of 1e-3 of the nominal ones, i.e. very low with respect to previously observed beams used for LHC filling.

During the night from Tuesday 28/6 to Wednesday 29/6, the LHC filling was delayed by 1h due to a front-end problem on BCT4.

On Wednesday 29/6 the fixed target beam was stopped at 8:00 for the dedicated MD. The beam was back at 18:30.

On Thursday 30/6 at 3:36 a glitch on the mains affected the whole accelerator complex. The SPS recovered quickly and was ready at 5:00, but the PS was still down at 8:00 when an intervention had been planned on POPS. During the POPS intervention, several interventions took place on the SPS: Modification of the QF regulation (swap DCCT1 and 2), tests of MST & MSE in DC, reconditioning of ZS, and RF power (cavity3). This latter intervention took a bit longer than anticipated so the SFTPRO beam was only back at 12:00.

On Thursday 30/6 afternoon, 30' of beam down time were due to a cooling water fault in BA6. Also 2h20' of beam time was lost due to two breakdowns on the PS (POPS and extraction kicker).

On Saturday 2/7 it was decided to inhibit the fixed target beam during the LHC filling as there were too many dumps.

On Sunday 3/7 beam was stopped at 19:45 due to a problem on POPS, fortunately just after filling the LHC. The beam was back at 21:00. There was another POPS interruption during the night, only affecting SFTPRO for 1h10'.

Q L. Soby: What was the problem with BCT?

A: It was a front-end problem.

Q: L. Soby: Was it BCT5 or BCT4? BCT4 is the high sensitivity monitor for ions only.

A K. Cornelis: It is also used for protons to check the quality (safe beam flag) of the beam for LHC.

North Area

B. Rae: It was a good week. On Wednesday the NA returned to the old wobbling configuration.

From 18th to 21st July the installation of a XTV table for the mobile dump is scheduled; DSO tests will follow on July 24.

North Area Users

H. Wilkens: Commissioning run for NA64 is scheduled during the following weeks. It will take some intensity away from COMPASS. The NA users would like to ask for more intensity from the SPS, if possible.

K. Cornelis: We'll try to prepare a 10% higher intensity beam. A dedicated MD is scheduled for this purpose.

Q R. Steerenberg: Shouldn't the intensity be increased in steps?

A K. Cornelis: No need for this, there is no danger so we can make it in one go, once the MD is successful.

Q B.Mikulec: Any formal approval is needed for the TIDVG?

A K. Cornelis: This has been discussed during the last IEFC. If the beam losses would be too big for whatever reason the change will not be implemented.

HiRadMat

There was no report.

AWAKE

No report.

LHC

R. Steerenberg: The LHC had a productive week with 2.4 fb^{-1} integrated and 59% in stable beam. The peak luminosity for each fill was at or just below the design luminosity. Main problems occurred on Thursday morning when due to the power glitch all experiments and all RBs went down. Since the recovery of the CMS cold box would take some time, a high beta (2.5 km) commissioning session was inserted to bridge the repair. Presently integrated luminosity is at 9.5 fb^{-1}, meaning that 10 fb^{-1} target should be reached sometime this week.

Linac3

D. Kuechler reported (Annex 2).

In average good beam intensity and stability (30+ μA in BCT25). Affected by the power glitch on Thursday.

Since Friday the intensity is dropping because the oven empties. Tomorrow the oven will be refilled.

On Friday the Dressler amplifier of the de-buncher had to be replaced due to overheating. No more spares are available!

Q B. Mikulec: Was there already an action opened on the spare situation?

A: The RF group has been made aware and is trying to provide some spares.

Q B. Mikulec: Anyone from the RF team who could comment next FOM?

A R. Steerenberg: I talked to E. Jensen and he said that he would follow it up.

Comment from R. Scrivens: I am supervising this week and I will follow it up. I will report next week.

Answer from S. Ramberger (received by email on the question of R. Scrivens)

'We have 3 or 4 working spares for the 202MHz Dressler amplifiers in Linac2 and Linac3 at the moment and we have 1 spare for the 2 101MHz Dressler amplifiers in Linac3. This one spare had been repaired by Giampaolo in the last days and it is currently being run successfully for test purposes in the lab.

As always when you have 1 spare, at the moment that you replace a broken amplifier, you have no working spare. As said, this situation has been corrected.

In the framework of the consolidation programme, we are currently working on the purchase of new amplifiers that will help reduce issues with the lately frequently failing 101MHz Dressler amplifiers. Also Giampaolo is doing additional maintenance beyond the actual repair, whenever there is a broken amplifier in the lab.

The item which looks more critical to us on the medium term is the replacement of the two 101MHz final Bertronix amplifiers. We have frequent failures and it could happen that we need the company to help us out in case of a major problem. The request for consolidation in LS2 has been refused in the last consolidation programme exercise. We will present it again in November.'

LEIR

S. Jensen:

- Tuesday, 28 June
  - 8h00, 7h – LN3 MD, beam back ~15h00
  - 15h35, 1h – LLRF bad connector in RF train distribution
  - 16h52 – OASIS multiple triggers missing. Configuration problem
- Wednesday, 29 June
  - 4h54 – RF cavity 43 down. A blown fuse.
- Thursday, 30 June
  - New LLRF operational, integration with CO goes well.
  - 3h30, 15h – Power glitch caused many elements to fail and require reset. A connector for the e-cooler filament came loose, diagnostics/repair done efficiently by A. Frassier.
  - 20h37 – EARLY-type beam accelerated with the new LLRF
- Friday, 01 July

- 10h26, 1h – change of overheating amplifier for LN3 debuncher
- 17h54 – Further progress on the new LLRF (MDRF synchronized)

Comment from D. Manglunki: Following a request of **A. Blas**, the damper will be not available on Wednesday and Thursday so we would like to ask LINAC3 to refill the oven at the same time. Today LEIR still delivers the nominal beam to PS.

Comment from R. Scrivens: I would like to remind about the MD block on Thursday afternoon for ion beam measurements in the LBS line.

Q R. Steerenberg: Since the delivered current is higher is the refill needed more often?

A D. Kuechler: No, all the intensity increase is due to reduced losses.

Q B. Mikulec: What was the most important change?

A D. Kuechler: An increased bore on the source from 60 to 140 mm reduced the losses.

PS Ions

Comment from D. Manglunki: He proposed that there should be constant monitoring of the lifetime.

CTF3

P. Skowronski for **D. Gamba** (Annex 8)

CTF3 recently suffers from high temperatures what makes the RF power supplies and measurements drifting.

The acquisition rate of the MTV screens was inversely proportional to the number of monitored MTVs (1 MTV connected: all OK, 2 MTVs: every 2nd pulse acquired, 3 MTVs: every 3rd pulse). Bug in MTV Fesa class found and corrected by BI.

TI

No report

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule. There were no modifications since the previous meeting.

4. AOB

1. Maintenance Access Point TT2 YEA01.TT2=269 (from July 6 until July 8 12:00). OK for RP. **Approved.**
2. Dedicated MD announcement in PSB (Wednesday). No PSB beam for all downstream machines/experimental areas from 11h to max. 18h, including the LHC. Tomorrow it will be decided if the bus bar intervention in the SPS (QF ripple) will be performed in parallel.
3. Swissgrid 380 kV intervention on 7/8 July. There might be some unexpected electrical disturbances.

Next Meeting: Tuesday 12th July 2016.

Minutes reported by P.K. Skowronski on 5th June

Summary of the 21st FOM Meeting

Held on Tuesday 12th July 2016

Agenda (https://indico.cern.ch/event/549654/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *LHC MD1 block beam requests - 26-30 July*
5. *AOB*

1. Follow-up of the last FOM

K. Hanke chaired the meeting.

The list of presence can be found in Annex 0.

The minutes of the last FOM were approved.

There were two open actions (Annex 1).

1. Concerning the SPS QF ripple, **K. Cornelis** said that investigations were still on-going. The disconnection of the Qsplit cable from the QF bus busbar did not solve the problem. The action stays open.
2. There was no update concerning the official wire scanner settings for the measurement of the transverse emittances in the injectors. The action stays open.

2. Status of the machines

Linac2

R. Scrivens reported the status of the Linac2 (Annex 2). The main down time (1 hour) was due to the change of a RF amplifier (Dressler). On Sunday evening, the PS Booster observed frequent missing pulses from the source. This was cured by increasing the source gas flow. As the flashover rate increased significantly at the end of the week, the source team would like to have a look in the Faraday cage the next time a beam stop is scheduled in the PS complex. **K. Hanke** confirmed that the Linac2 team will be warned next time the Linac2 beam could be stop for 1 hour.

PSB

K. Hanke presented the status of the PS Booster for **B. Mikulec** (Annex 3). It was a very good week and the major downtime was due to the Linac2 RF intervention. The ring 1 horizontal wire scanner shows strange signals since a while and this is possibly a sign that the wire is reaching the end of its lifetime. It is now used only when absolutely necessary. BI was asked to prepare for the replacement during the next technical stop (as well as for the R4 vertical wire scanner already broken). **K. Hanke** noted the successful dedicated MD that took place on Wednesday during which 80% of a 60e10 p beam was dumped at 160 MeV (in preparation of the commissioning phase with the Linac4 beam).

ISOLDE

J. Alberto Rodriguez reported the status of ISOLDE (Annex 4). It was a pretty good week for HRS and the only downtime came from a fault on the RF amplifier in the RFQ cooler. GPS MD and setting-up were perturbed by high voltage trips.

ISOLDE Users

K. Johnston said that the main physics aim of the week was to perform collinear laser spectroscopy on neutron-rich Sn isotopes, up to 136Sn. In spite of a difficult start-up the users were able to measure quite nicely up to 134Sn, but beyond this the yields were too low to be useable. Therefore the full physics aims weren't achieved, but the first detailed hyperfine scans on 133 and 134Sn were taken, with good statistics. The users will come back with an addendum for the more exotic Sn isotopes.

PS

M. Fraser reported about the status of the PS (Annex 5). Apart from temperature related POPS trips it was a good week for the PS. Priority for LHC ion set-up was decided and the 4-bunch variant took precedence. A solution for the noise on the ion lifetime measurement in the PS was found and is now being made every shift, as requested. Throughout the week the LHC BCMS blow-up variant was worked on and delivered on Friday. On Tuesday evening POPS tripped due to a temperature interlock on its transformers that connect it to the external grid. The super-cycle load was pulling a reasonable 5.2 MW, which is above the physics baseline load of 4 MW (when not filling LHC) because of MDs and LHC ion set-up. POPS was up and running after 100 minutes of downtime. POPS suffered from another couple of minor trips during the week and again tripped on Friday evening due to the temperature interlock at a load of 5.3 MW. In view of the temperatures forecast over the week it was decided to limit the load to 4.5 MW, which will limit beam availability for MD's and setting-up. LHC filling was not affected. Still, POPS tripped again on Sunday evening with the load at 3.9 MW for most of the day, except for LHC filling after mid-day (4.3 MW) and was down for about 1 hour. T9 reported the vertical beam position as unstable throughout the week. A First Line intervention on ZT9.BVT.01 improved situation for a short while but the problem persists (to be followed-up).
K. Hanke asked if the POPS cooling issue could be related to the degraded mode. He also asked TE/EPC to provide a solution and give some temporary consigns to the PS operation when outside temperature exceeds 30°C. **C. Mugnier** said he will check with **F. Boattini**. An action was opened (TE/EPC).

East Area

B. Rae said it was a pretty good week expected for the T9 line where the users were slightly affected by the vertical beam position instabilities. They might be related to an issue with the ZT9.BVT.01 power converter. The expert comes back tomorrow and will solve the problem.

East Area Users

H. Wilkens said it was a good week for the EAST Area users. He added that the current user in T9 isn't affected too much by the vertical fluctuation of the beam position.

nToF Users

D. Macina said it went very well over the week. The experiment will be changed in EAR2 next week from Monday to Wednesday (accesses during days and beam during nights).

AD

B. Lefort said there was no issue to report.

AD Users

H. Wilkens said that the ATRAP experiment were not using the beam last week and this week. They were running with two shifts a day (11 to 11) with ALPHA and AEGiS last week and ASACUSA and ALPHA this week.

SPS

K. Cornelis reported the status of the SPS (Annex 6). It was a pretty good week for the SPS with efficient LHC filling in between long coasts and 90% availability for fixed target. During the dedicated booster MD, the Qsplit cable was disconnected from the QF bus bar in the hope to cure the QF glitches. Unfortunately, the QF glitch continued to manifest it selves this weekend. Thursday morning there were some problems with the damper due to some unfortunate software changes. On Friday the FT duty cycle was increased and they are now running with on FT-cycle every 18 seconds. The beam dump vacuum and temperature are still stable. LHC fills with the blown up BCMS started on Friday (already 4 fills). The beam is not as clean as the nominal one (a bit more satellites and tails) but acceptable for LHC fillings over the weekend.

North Area

B. Rae said it very good week.

North Area Users

H. Wilkens said that the increased duty cycle (1/18s) is very much appreciated by both the test-beam users as the fixed target experiments. COMPASS can now hope to accumulate over 50% of the expected statistics, while it was just over 30% with the previous duty cycle (1/33.6s).

HiRadMat

B. Rae said there was nothing to report.

AWAKE

K. Cornelis said there was no issue. **F. Pirotte** added that the Laser DSO test was done and its commissioning was starting today.

LHC

K. Cornelis said it was a very good week with 80% up time and 3 fb^{-1} accumulated. The present beam size will be kept at least until the 15/07.

Linac3

R. Scrivens reported the status of the Linac3 (Annex 2). The operation was very stable. The ovens refill took place on Wednesday.

LEIR

D. Manglunki reported on the LEIR status (Annex 7). It was a short week but very productive. The EARLY beam was delivered to the PS for lifetime measurements, and the NOMINAL to continue setting up the 4 bunch beam which will be used for the p-Pb run in the LHC. All through the week including the week-end, on user MDRF, the commissioning of the new low-level RF system went on. The spare cavity, ER.CRF41, is now permanently controlled by the new low-Level RF system. It looks possible to switch to the new system as early as next Thursday, July 14th. However some OP software such as Tomoscope and Chromaticity measurement would need to be adapted to the new FESA classes and properties, provided the authors can be available during this holiday period.

M.E. Angoletta added that, due to man power constraints during the holyday period, the switch to the new LLRF system could only take place on Thursday or be postponed to the end of August.

D. Manglunki also reminded that the measurements of the life time at PS injection energy should be performed at every shift (3 times a day).

CTF3

F. Tecker reported the status of CTF3 (Annex 8). The main issue came from a water leak on MKS12 on Wednesday. The klystron was replaced and beam was back on Friday. The week-end dogleg run was very short (9 hours) due to a fake interlock and a XBOX filament heater power supply trip.

TI

In the absence of a TI representative, **K. Hanke** reported that the week was very quiet, except for a mirco-glitch during the night form Monday to Tuesday.

3. Schedule updates

K. Hanke presented the latest version of the injector schedule v1.6 (Annex 9). **D Cotte** said there will be a dedicated MD in the PS tomorrow from 8:00 to 13:00.

4. LHC MD1 block beam requests – 26-30 July

K. Hanke reminded that the LHC MD1 block is re-scheduled from the 26th to the 30th July (Annex 10). The only two non-standard beams requested from the injectors are 25 ns BCMS and special INDIVs tweaked by the SPS RF team.

5. AOB

Following the request from **D. Chapuis**, the maintenance of the AD target access point YEA01.ADT=853, scheduled from Wednesday 13/07, 8:30 to Friday 15/07, 12:00 is approved.

Next Meeting: Tuesday 19th July 2016.

Minutes reported by JB. Lallement on 13th July.

Summary of the 22nd FOM Meeting

Held on Tuesday 19th July 2016

Agenda (https://indico.cern.ch/event/556860/)

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 last FOM were approved.

There were three open actions (Annex 1).

1. Concerning the SPS QF ripple, **K. Cornelis** and **X. Genillon** said that investigations were still on-going. The replacement of the QF by the QS on Thursday did not solve the problem. The action stays open.
2. Concerning the official wire scanner settings for the measurement of the transverse emittances in the injectors, **B. Mikulec** said that **A. Guerrero** wrote a document that she circulated. The document covering the full beam intensity range should be extended and will be released by the end of the summer. The action stays open.
3. Concerning the issue with the POPS TR2 over-temperature trips, X. Genillon said that the maximum temperature threshold was set too low and was increased last week (Annex 2). It was increased to 110°C for the trip and 100°C for the alarm. He confirmed that the issue was now solved. The action is closed.

2. Status of the machines

Linac2

G. Bellodi reported the status of the Linac2 (Annex 3). The only downtime (40 mins) was due to the replacement of the primary scroll pump (LP.VGP02) on Friday morning. The source intensity started to slowly decrease on Thursday 14/07, which might be explained by a vacuum leak. The Linac2 team

requested to have a vacuum leak detection as soon as possible on the source (would require 1.5 hour beam stop). The intervention scheduling was discussed in § 3 (Schedule Updates).

PSB

GP. Di Giovanni, presented the status of the PS Booster (Annex 4). He said it was a pretty good week with only one issue related to the BT2.DHZ10, which frequently tripped during a LHC fill. The issue was tracked back to different PPM values between users in the supercycle (but which are well within operational limits). TE-EPC performed a few interventions, but could not solve the problem or replace the power converter with the spare. He also added that a slow drift of BT4.SMV10 current over time was observed. Concerning this last point, **X. Genillon** said that **J. Parra-Lopez** will call the CCC to define a good moment to intervene.

ISOLDE

M. Lozano Benito reported the status of ISOLDE (Annex 5). There was no problem on GPS. A problem occurred on HRS on Saturday night when four power supplies tripped at the same time. The First Line piquet replaced the power converters with spares, but this did not solve the problem. The experiment had therefore to stop until Monday morning, when **J. Parra-Lopez** found that the spares were not well connected.

ISOLDE Users

K. Johnston said that GPS users had an excellent week and were very happy. The newly installed neutron detector worked extremely well and smoothly. The users on HRS will have an extra beam time tonight to recover a part of the time lost last week-end.

PS

D. Cotte reported the status of the PS (Annex 6). It was a very good week with 95% availability. After the POPS cooling temperature alarm issue was fixed, the only remaining restriction on operation is not to go above 3 kA RMS current (situation that never happened this year). Different version of BCMS beam were sent to the LHC. Strong variations of the emittance (from 1.6 to 2 mm.mrad) were observed in correlation with the Linac2 source current.
A dedicated MD will take place in the PS tomorrow from 7:45 to 17:45 with an access to the switchyard scheduled at 10:15 for 15 minutes. There will be no beam for the PS users. The PS will take MTE beams and provide beam to the SPS for their MD. LHCINDIV will be added to the supercycle if needed for an LHC fill.
B. Mikulec said that the maintenance of the switchyard access point (AOB) should be postponed to allow for the PS access during the MD.

East Area

L. Gatignon said that the T9 bending and quadrupole magnet fluctuations were fixed on Wednesday and Thursday, respectively.

East Area Users

H. Wilkens said the week was fine for the users. The T9 users having a very small diamond detector, it was very important that the issue of the magnets fluctuations was solved.

nToF Users

F. Mingrone reported by email that they were finishing the dismounting of STEFF and that the data taking would continue as usual from Wednesday afternoon.

AD

J Carlos reported the status of the AD (Annex 7). A kicker tripped on Friday evening and there is no piquet for this device. The fault could be reset with the specialist helping on the phone. ATRAP could not take beam on Sunday. Their vacuum valve had to be replaced by the vacuum piquet, and a temperature default occurred on a magnet (had been solved only on Monday morning).

AD Users

H. Wilkens said that there was nothing more to report for the users.

SPS

K. Cornelis reported the status of the SPS (Annex 8). It was once again a very good week for the SPS with an availability for fixed target of over 92%. The SPS downtime was mainly due to power convertor problems on Wednesday evening (MDHI1021 in TT10 and the splitter in TT20). The MDHI1021 could not be repaired and was finally replaced by a spare. The splitter PC could be temporarily fixed, but an intervention was needed on Thursday morning in order to do a permanent repair. The QF was replaced by the spare QS on Thursday. First observations indicated that the 65 Hz on the spill disappeared, but was unfortunately replaced by a 10 Hz noise. The LHC side continued to be filled with the blown-up BCMS. The bunch to bucket transfer from PS to SPS was optimized by the experts in order to reduce satellites. As from Saturday the emittance of the BCMS was reduced for LHC filling, resulting in an increased initial luminosity**. V. Kain** commented that they now observe 25 to 30 Hz on the spill.

Answering a question from **H. Vincke, K. Cornelis** confirmed that the beam availability was calculated over the periods the SPS is supposed to deliver beam.

North Area

L. Gatignon said that the restart was difficult after the SPS MD. Two rectifier repairs took place in the shadow of the machine problems. Otherwise very smooth operation. Users are extremely happy with the two spills per super-cycle. During this week two new XTDV mobile dumps will be installed downstream of the GIF facilities. A DSO test will be done on Friday or next Monday.

North Area Users

H. Wilkens said that the users were very happy with the beam quality.

F. Tarita said that the 48 Vcc network is ageing and had to be replaced. The aim is to have most of the work done during the run in order to have only 15% left to be done during the YETS. The preparatory work will have no impact on the operation. **B. Mikulec** said that there was no objection from the FOM, but this intervention should be discussed and approved at the **IEFC**.

HiRadMat

L. Gatignon said there was nothing special to report. The next run is scheduled for mid-August.

AWAKE

K. Cornelis said there was nothing to report.

LHC

K. Cornelis said it was a good week with a new record in luminosity reached on Saturday thanks to the smaller emittance from the injectors.

Linac3

Giulia reported the status of the Linac3 (Annex 3). The operation was very stable. The ovens refill took place on Wednesday.

LEIR

S. Pasinelli reported on the LEIR status (Annex 9). It was a very productive week. Hard work was done on the LLRF. The experts managed the migration to the new LLRF. The new LEIR LLRF has captured, accelerated, synchronized and sent to the PS both EARLY-type and NOMINAL-type beams. The Stray Field Compensation on the ETL.BHN10 GFA was tested and deployed with success. An MD took place on injection at 10 Hz and electron cooler optimization. Concerning the recurrent fault on the main quad ER.QFN2344/ER.QFT23, the problem was found, after a fire alarm in building 150, on the ETP.BHN10 power supply.

CTF3

D. Gamba reported the status of CTF3 (Annex 10). The Drive Beam operation recovered after some issues with klystron 12 that affected the previous week operations. Thanks to the PS operators who supervised the beam, they could have a Dogleg run during the week-end. The stability of many RF equipment is affected by the hot temperatures and there are still some issues with 1.5 GHz TWTs.

TI

There was no report.

3. Schedule updates

B. Mikulec presented the new version of the schedule v 1.7 (Annex 11). The main change is the repositioning of the LHC MD blocks.
The PS dedicated MD will take place tomorrow from 7:45 to 17:45 with an access around 10:00. As the Linac2 source team would like to have a leak detection on the source, it is proposed to plan this intervention in parallel with the PS access (soon after the FOM, it was decided to delay this access by few hours)**. D. Cotte** added that the super-cycle would be composed of 22 basic periods with up to 14 MTE cycles with beams available for the SPS MD and for LHC filling.

The LHC MD block originally planned for June is scheduled next week. In general there are no injector MDs during weeks of LHC MDs.

4. AOB

The maintenance of the access point YEA.SWY=151 initially scheduled to start tomorrow at 8:00 has to be postponed to allow for the PS access during the dedicated MD. **B. Mikulec** will inform **B. Morand**.

Next Meeting: Tuesday 26th July 2016.

Minutes reported by JB. Lallement on 21st July.

Summary of the 23rd FOM Meeting

Held on Tuesday 26th July 2016

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

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in Annex 0 .

1. Follow-up of the last FOM

The minutes of the last FOM were approved.
There were 2 open actions (Annex 1),

1. Concerning the SPS QF ripple there were no additional news. The action stays open.
2. There was no update concerning the document of procedures for WS settings for the injectors. The action stays open.

2. Status of the machines

Linac2

M. O'Neil reported the status of the Linac2 (Annex 2).
Availability was very good (98.45%), but since 2 weeks the source has 10% lower intensity. It started dropping after a series of flash-overs on July 7 and past week stabilized at 250 mA. During the past week the vacuum was checked and a vacuum leak outside the source repaired. Also tuning of different source parameters was attempted, but no improvement was achieved. Requesting 2h of beam stop for additional checks (see Schedule).

PSB

A. Findlay presented the status of the PS Booster (Annex 3).
96% availability during the past week. Only one single real issue - after the Linac2 source intervention on Wednesday afternoon, the beam was no longer kicked out of the machine for the PS or PSB MD beams, but was still extracted correctly for ISOLDE. After checking the BIS, it was found that the status for BT.BHZ10 was not correct; a reset of the power supply returned the situation to normal. About 1H15 was lost.

Q. from A. Findlay: I understood that there are no more spare units of electrovalve solenoids for the pulsed septa of the PS complex.
A. by M. Hourican: We have just received a number of spares, so we should be OK. We plan to make several changes of the system during the EYETS and hopefully will not encounter this problem after this.

ISOLDE

J.A. Rodriguez reported the status of ISOLDE (Annex 4)
Isolde GPS: Several Hg isotopes to IDS and GLM/Biophysics experimental stations (Wed-Tue: 148 hours). Downtime:

- Trip of the Target and Lines heating power supplies (3.7h)
- Accidental venting of experimental station (1.5h)
- Intervention in the Linac2/PS Booster (2.75h)
- Several hours during set-up because of problems with the cfv-197-bisoinst FEC (wire scanners)

Isolde HRS: several Ra isotopes to CRIS (continuation from previous week Tue-Wed: 24 hours)
Downtime:

- Several power supplies for the electrostatic quadrupoles tripped

Set-up Cs to ISOLTRAP Tue-Wed: 11 hours.

ISOLDE Users

K. Johnston: Smooth operation without any major hitches. Since the middle of the week mercury isotopes for graphene studies.

PS

G. Sterbini reported the status of the PS (Annex 5).
It was a good week for the PS with only minor hardware problems that could be solved with the help and the fast intervention of the piquet teams.
On Monday afternoon POPS tripped. The system went down for 1 h due to a too conservative setting of one alert threshold. The specialist reset and re-adjusted it to avoid similar hiccups in the future.
Wednesday was dominated by the activities related to the RP MD. The goal was to assess the machine radiation level in presence of a high proton flux on the extraction region (1000e10 p/s). Unfortunately, the MD was hampered by several faults and interventions and could not be completed (change of the thyratrons on BFA9 and KFA21, intervention on Linac2, problem with the h8 beam control, problem with the BIS of the PSB, fire brigade intervention in B151 due to a smoke detection). Operational beams were back at 20h30.
The rest of the week was very calm with no major downtime.
As requested, last week the BCMS beam was sent to the LHC without emittance blow-up.
All other operational beams are regularly delivered.

A 1h access to the PS-RING is needed for the C20-80 and the C80-08 cavities, and also to the Switchyard for replacement of the PU25 electronics.

Q. from B. Mikulec: How long will the total beam stop for the cavities be?
A. by C. Rossi : 30 minutes for C20-80 to exchange a low voltage power supply, so it should be easy. Concerning C80-08 it is not clear what the problem is, so it cannot be determined now.
Q. from B. Mikulec: Cool down times?
A. R. Froeschl: 0.5 - 1h are needed. This has to be confirmed.
Q. from D. Manglunki: Would you be ready for the intervention already from this morning?
A. by C.Rossi: Yes.
Comment from B. Mikulec: It may be problematic for the LHC.
M. Giovanozzi: Until 12h the LHC is stopped anyway.

East Area

B. Rae: A good week without special issues.

East Area Users

H. Wilkens: All fine, happy users.

nToF

F.Mingrone: Nothing special, 2 accesses last week.
Q. from B. Mikulec: Are more access planned for this week?
A: Yes, tomorrow and in 2 days.
Q. from B. Mikulec: There is the maintenance request of access door YEA01.TFP=801, so it could be an issue.
A. R. Froeschl: It should not affect the accesses, as the access is in a different area.
B. Mikulec: As there are no objections, the intervention on the access door is approved.

AD

L. Bojtar reported on the AD status (Annex 5)**.**
Wednesday night an intervention was needed due to unstable beam. This originated from a power supply, which was cycling between standby an on.
Thursday morning AEGIS ramped up their 5T solenoid, which affected the beam in all extraction lines. Re-steering ALPHA, ASACUSA, ATRAP and AEGIS.
Two times during the week the extracted beam became unstable. It turned out that the ejection kicker timing drifted, probably due to outside temperature changes.
Sunday morning an intervention took place due to frequent beam losses after the injection flattop. The beam got stable again before the culprit could be determined, but it is likely that the C02 cavity had a problem. It didn't drop out, but for some cycles it provided no voltage. This problem was observed already before.
Q. from B. Mikulec: Was a specialist already contacted for follow-up of the ejection kicker timing drift?

A. by M. Houricane: I will pass the message on during the meeting tomorrow.

AD Users

H. Wilkens reported. The experiments are running fine. Last week AEGiS turned on the 5T magnet and is running with field from there on.

SPS

V. Kain reported the status of the SPS (Annex 6).
The BA3 transformer tripped because of high temperatures outside. It took 8h to recover the beam.
The issue of the TIDVG dumped intensity spurious SIS triggers is understood now and is linked to the multiple publication of the time of beam dump during a cycle. A fix has been prepared by ABT as well as by OP within SIS. ABT will only be able to deploy the fix during a 45 min beam stop.
Since Wednesday after the dedicated MD the batch spacing is 250 ns. The re-validation of the 225 ns started on Friday, but needs another session together with the PS, as the PS extraction kicker does not seem to be perfectly adjusted and the analysis of the effect of the SPS injection kicker is then not straightforward. The switches have however been adjusted again in BA1. Switch 7 (MKP4) had to be moved by 20 ns.
Bunch intensity for the LHC B2 was reduced to mitigate the LHC MKI vacuum pressure rise due to the electron cloud, which in turn was provoked by the reduced batch spacing.
With the QS instead of the QF converter the noise spectrum of the slow extracted spill changed. Now the frequency peak is at 30 Hz. Users have a right to complain, as it is visible even on the AQN.
Q by B. Mikulec: Can you talk to the equipment specialist to check the PS kicker issue?
A.: Yes.
Q. by L. Soby: Which transformer gave the problem?
A: It was not a beam instrumentation beam current transformer.
Comment from C. Grenaud: The air temperature needs to be stable in the galleries and it is not the first time this problem happens in the SPS. There were ventilators that were off or one air-conditioning unit in heating mode instead of cooling. The power supplies are air-cooled and need cool air in order to work correctly.
A. by S. Deleval: The PLC controller is problematic. After the power cut it switched the units. A consolidation plan of this system was approved past year and it is in preparation to change to a reliable system. Each year multiple units are upgraded.
Q. from B. Mikulec: When will the consolidation be finished?
A.: We will have to live still many years with PLCs from the old system.
Q. from B. Mikulec: Alarms are emitted correctly?
A.: No, we are blind in case of a PLC fault.
Q. from B.Mikulec: Can you check in more detail and investigate what happened this time?
A.: Yes, of course.

Follow-up received by email from S. Deleval:

Here is the follow-up of the last meeting and the answer to RF's comments.

- 21/07: very warm temperature inside BA3 after the power cut. The problem is known and consolidation program is ongoing. As it will last until 2022, compensatory measures is taken to reduce the effect of this problem. This event is detailed here: https://op-webtools.web.cern.ch/group_reporter/faults/20145?type=major

- 21/07: draining valve was opened on the SPS primary circuit in the false floor of the BA3. The question has been raised to CV staffs and contractors. We organised meeting onsite with contractors. Nobody from CV opened this valve. We are the first concerned by this kind of event and we were called at the same time than the fire brigade.

- BA2: modification in flow setting during last technical stop. During an intervention to replace safety relief valve, the valve to regulate the flow has been touched and the flow was modified. We are still investigating that event with our contractor but indeed it looks they manipulated those valves instead of the sectioning valves which are more difficult to access. As the area is really radioactive it's probable that they used the easiest solution. We'll have a dedicated procedure for this intervention

North Area

B. Rae:

- Intensity increase on T4 still subject to approval by CERN management.
- T4 wobbling was changed yesterday to give higher intensity to H8. Back to normal this morning.
- XTDV on H4 is operational.

North Area Users

H. Wilkens: NA62 was running well. NA62 will request a rise in intensity early August; we will then increase the intensity on T4 from 15 to 30 units (1E12). This will go at the cost of the intensity delivered to COMPASS. However, it was previously estimated that NA62 would need 40 units on T4, the 10 units are gained by using the shorter target in T4. The updated calculation of the projected integrated amount of protons which will be delivered to COMPASS in 2016 now yields 60% of what was expected, to be compared to 50% reported 2 weeks ago.
Q. from B. Mikulec: Does the 60% allow COMPASS to complete their physics program?
A: The experiment will have to continue their run also into the following year.

HiRadMat

B. Rae: All fine. The next users will install their experiment next week and some accesses will be needed.

AWAKE

No report.

LHC

M. Giovanozzi: Good week. Since the past week started using BCMS beams and delivered 3 fb^{-1}. Suffering from vacuum issues on injection kickers due to electron cloud. Therefore, the intensity, especially for Beam 2, was slightly reduced to keep the vacuum within the permitted limits. At the moment LHC should be already in MD mode, however cryogenics had some problems. The beam should be back only around 1PM.
Following the MD week, the filling scheme will be changed to reduce the gap spacing and to achieve a higher total number of bunches. 12-bunch beam should be looked at to reduce the satellites content.

Linac3

M. O'Neil
Good week, ovens were refilled and reached 25 μA beam. Hoping to reach 30 μA.

LEIR

Steen Jensen: (Annex 7)
2 stops on Tuesday, each half an hour

- Trip of ER.QFN2344 and ER.QFT23. C. Mutin changed auxiliary contacts.
- Problem with function generators for the transverse feedback, no connection to the FEC. Solved by J. Betz (CGAFG expert).

Last Friday there was a jitter problem in the OASIS multi-trigger system. It was solved by A. Radeva (OASIS expert) by changing a signal from being TTL_BAR to TTL. On the same day, an electron cooler problem occurred with gun cathode filament heating; short access by G. Tranquille to increase the limit. G. Tranquille will investigate further on Monday during the Linac3 oven refill. Both RF cavities (CRF41 & CRF43) tripped, and subsequently were unable to restart. This was solved by M. Haase, who changed the medium power supply for CRF41, and verified also CRF43.
On Monday the Linac3 oven was refilled.

Q A. Findlay: Yesterday an intervention was scheduled for the transverse feedback to change some power supplies (2nd attempt, the past intervention was not successful). Did it happen?
A. by D. Manglunki: The team asked to postpone it.

PS IONS

G. Sterbini reported the PS status.
The ion lifetime is measured during each shift as agreed. 3-4 sec ion lifetime were deduced from beam measurement. No degradation is visible at the moment.
Sill need to commission the extraction for ions, and for this the cavity recheck is needed.
Comment from V. Kain: We would like to start next week in the SPS with the EARLY beam.
A. by D. Manglunki: Single bunch should be no problem.
Q. from D. Manglunki: The lifetime was above 5 sec, do you know what happened that it decreased?
A.: We do 3 measurements each time and there is quite big difference between them, around 50% of the mean value.
Q. from D. Manglunki: Did you change anything in the sublimation?
A. by J. Somosa: No, no change in the settings. One week ago we started doing sublimations every day. We do not see any relation between sublimation and beam lifetime.

CTF3

L. Malina (Annex 8)
There were 2 issues. First, one Travelling Wave Tube amplifier for the Sub-harmonic Bunching System is out of order. Contacted the manufacturer for assistance, but no answer yet. The RF team will attempt to get a spare out of 2 old broken ones, but it will happen only in 3 weeks when the specialists are back from vacation.
Another problem that occurred past week was a broken vacuum controller that prevented valves to be opened. It was promptly fixed.

TI

No report:

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule. There were no modifications since the previous meeting.
Next week ions should be sent to the SPS and an access is needed to fix the cavities in the PS.
J. Uythoven (the LHC MD coordinator) said that Wednesday early morning would be preferred, assuming the LHC is already filled. Another option would be Friday afternoon. The latter one is naturally not a good option.
No more objections were raised. **Approved injectors intervention on Wednesday 27th of July starting at 8:30.**

4. AOB

1. Maintenance access point YEA01.TFP=801 - Wed 27/07 - Fri 29/07. **Approved.**

V. Kain will chair the following meetings.

Next Meeting: 2nd of August.

Minutes reported by P.K. Skowronski on July 27.

Summary of the 24th FOM Meeting

Held on Tuesday 2nd August 2016

Agenda (https://indico.cern.ch/event/560336/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *AOB*

1. Follow-up of the last FOM

V. Kain chaired the meeting.

The list of presence can be found in Annex 0.

The minutes of the last FOM were approved. Comments from **S. Deleval** were added to the 23rd FOM minutes.

There were two open actions (Annex 1).

1. Concerning the SPS QF ripple, **X. Genillon** said that investigations were still on-going. Simulations showed that the problem could come from the charge. The action stays open.
2. No update concerning the official wire scanner settings for the measurement of the transverse emittances in the injectors. The action stays open.

2. Status of the machines

Linac2

JB. Lallement reported the status of the Linac2 (Annex 2). There are still some concerns with the proton source. Although the situation is now rather stable, the intensity level is maintained by keeping the cathode and arc currents at pretty high values, which might shorten the cathode lifetime. As last week's checks were inconclusive, another 2 hour beam stop was requested to further investigate what might be wrong inside the source (for leak detection and RGA). Scheduling of the stop was discussed in § 3. Apart from that, everything went very well last week.

PSB

JF. Comblin presented the status of the PS Booster (Annex 3). It was a very good week for the booster with 96% availability and only two major faults for a total downtime of about 5 hours. For the first

time Isolde asked staggered beams to both targets at the same time. Only one timing user is available and the surveillance of settings for some systems with Isolde applications was insufficient. In order to avoid similar troubles in the future, applications should be made compatible with INCA allowing an "online check" before cloning a beam that is already mapped.

ISOLDE

M. Lozano Benito reported the status of ISOLDE (Annex 4). It was a very good week for GPS (beam was taken only for one day). It did not go so well on the HRS side with many problems on target heating. In order to overcome these problems, it was decided, on Wednesday, to go for STAGISO beam configuration, quickly provided by the PSB thanks to their very good reactivity. An issue was then found on the HRS vistar which did not display correct information about the ppp. The proton beam position interlocks was also not working due to an application (HRS vistar configuration) not correctly INCAfied. Together with the PSB operators they investigated the problem and discovered that the beam was ending up on the target instead of in the neutron converter. This problem only appears when taking STAGISO beam on HRS and a fix will be put in place when the control expert is back from holidays. **Action**: A thorough investigation is required and this interlocking loop hole due to corrupted acquisition and inadequate settings management needs to be addressed.

An action was opened.

ISOLDE Users

K. Johnston said that GPS went very well. As already mentioned, HRS had quite a few problems with the target. The last minute change to STAGISO beam improved the situation but results were not so good on the physic side.

PS

G. Sterbini reported the status of the PS (Annex 5). It was a pretty good week with 94% availability. On Thursday night there was a 3 h downtime for the EAST beams due to the SMH57 problem that required a TE-ABT specialist intervention (adjustment of the temperature interlock). On Monday night there were 3h45min downtime due to the unavailability of the PSB injection septa. ToF beam production was stopped for 1.5 hour due to a problem with the BHZ403 magnet. 5 POPS trips were recorded over the week (reason understood in most of the cases). The problem with the C80-08 cavity was solved during the Wednesday morning access. Investigations are still ongoing concerning the C20-80. Several non-resettable trips of the F16.QDE217 quadrupole occurred during the week (TT2 quadrupole needed for the ions). EPC Piquet interventions have not cured the problem yet. A dedicated MD will take place in the PS tomorrow (Wednesday). As the week before, the supercycle will be dominated by MTE cycles.

East Area

B. Rae said it was very good week

East Area Users

H. Wilkens said that the users were happy.

nToF Users

D. Macina said that apart from the problem already mentioned, the week was very good. The experiment will be changed next week in EAR1 with consequently accesses in the area.

AD

B. Dupuy reported the status of the AD (Annex 6). It was a good week for the ADE with only minor hardware problems. Some malfunctioning of the C02 cavity were observed. The C02 doesn't drop but there is no voltage visible, this problem is now recurrent but random. ASACUSA did not get beam over the week-end due to an issue with the RFQD. Although **L. Timeo** kindly came on Friday night, the problem could not be fixed before Monday morning. The DR.BHZTR20.21 power supply broke on Sunday making the AEGIS beam unstable for 2 hours, until the First Line fixed the issue. The kicker timing drifts entail proton intensity variations between 2.8e7 to 3.8e7. Investigations on the origin on the timing jitter are still ongoing.
T. Kramer confirmed that the specialists were working on the kickers issue but the problem was not understood yet.
C. Rossi commented that, as happening randomly, the C02 cavity problem was not yet observed by RF specialists.

AD Users

H. Wilkens said that the week was good for the users. The BASE still has no need to refill (still 6 trapped antiprotons).

SPS

H. Bartosik reported the status of the SPS (Annex 7). It was a very good week with an availability for the fixed target beams of 89%. The 10 and 30 Hz components in the frequency spectrum of the extraction spill are still observed, in particular after periods without beam where the SPS mains had a reduced load due to the dynamic economy. On Wednesday evening, ABT experts could optimize the normalized losses in the extraction channel for the fixed target beam by realigning the ZS extraction septa. The problem of the spurious TIDVG dumped intensity SIS trigger could be temporarily fixed by a modification within the SIS. An 8 hour downtime was accumulated on Wednesday due to a fault on the drainage water pumps in BA5. Auxiliary pumps and a temporary water reservoir had to be installed to pump away the water in the drainage. The broken pumps need to be repaired during the next technical stop. On Sunday, almost 3 hours of downtime were caused by low water level on the cooling circuit of the power couplers of cavity 3 requiring an access of the RF power piquet. The SPS prepared and delivered a variety of LHC MD beams. On Wednesday evening the 225 ns batch spacing was re-validated by ABT experts with the BCMS beam, and successfully tested during an LHC MD on Thursday. It can be tested for LHC physics production next week. On Sunday morning the SPS provided a low intensity and low emittance single bunch beam for the 2.5km beta* test fills.

V. Kain remarked that the significant differences in emittance were measured in the LHC along the injected batches following the PSB ring pattern. The SPS numbers on emittance are only valid for the first part of the batch due to the way the wire scanners are used in the SPS (turn mode). (Significant cross-talk between bunches in bunch-by-bunch mode measurements removes the utility of the bunch-by-bunch mode.) **Action**: report on emittance status for BCMS beams ring by ring from PSB in next FOM.

An action was opened.

T. Bohl commented that the downtime time related to the broken power supply for B-train should not be allocated to the RF group in the statistics but to the magnet group.

North Area

B. Rae said it was a pretty good week with only minor problems.

North Area Users

H. Wilkens said that the users were happy. The NA62 users did not complain yet about the ripples.

HiRadMat

There was no report.

AWAKE

There was no report.

LHC

M. Lamont said that the LHC was in MD last week. The 2.5 km beta* was reached on Sunday.

V. Kain remarked that in case different intensities are required again for beam 1 and beam 2 filling, the intensity will now be adjusted in the PSB and not in the SPS with the scrappers as it was the case last week. This is to reduce activation in the SPS.

Linac3

JB. Lallement reported the status of the Linac3 (Annex 2). The ovens were refilled on Monday and stable beam was delivered to LEIR from Tuesday afternoon. Next oven refill is schedule on Wednesday August 10th.

LEIR

D. Manglunki reported on the LEIR status (Annex 8). A pretty good week with MDs and beam optimization. Thanks to the hard work of the RF team, both phases of the new LLRF commissioning

were performed: the machine is now completely operating with the new LLRF system with the cavity CRF41 used as normal and the cavity CRF43 that can be used as spare or to provide additional voltage (originally scheduled for November). Single bunch EARLY beam was sent to the PS for lifetime measurements. The CRF41 HV tripped on Tuesday and Saturday night and needed to be reset locally. A solution is foreseen for EYETS but will have to be implemented before the LHC p-Pb run if this happens too frequently.

PS

G. Sterbini reported that the lifetime is measured at every shifts and is around 5 sec. They were still setting up the beam and it would be taken by the SPS on Thursday.

CTF3

There was no report. **D. Gamba** uploaded a report in Indico (Annex 9).

TI

There was no report

3. Schedule updates

V. Kain presented the injector schedule v 1.7 (Annex 10). The SPS will start to take the ion beam this week. An LHC MD week is scheduled on week 34. **G. Papotti** will be asked to provide a list of the requested beams form the injector for the next FOM.
Not to disturb the LHC, it is decided to schedule the Linac2 source intervention on Thursday morning from 8:30 to 10:30. The ion chain will be kept during that period. The exact starting time will be confirmed on Thursday morning, depending on LHC fills.
R. Scrivens commented that should something be discovered during the intervention, some extra time might be requested.

4. Dedicated MD updates

As already mentioned by **G. Sterbini**, **H. Bartosik** reminded that a dedicated MD is scheduled in the PS on Wednesday morning during which no beam will be available for physics.

5. AOB

There were no AOB.

Next Meeting: Tuesday 9th August 2016.

Minutes reported by JB. Lallement on 3rd August.

Summary of the 23rd FOM Meeting

Held on Tuesday 9th August 2016

Agenda (https://indico.cern.ch/event/561518)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *LHC MD2 block beam requests*
4. *Consideration for anticipated LHC ion run*
5. *Schedule updates*
6. *AOB*

V. Kain chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.
There were 4 open actions (Annex 1),

1. Concerning the SPS QF glitch investigations there are no news. New observations indicate that the 30 or 60 Hz intensity variations of the slow extracted spill are also coming from the QF/QS power supply ripple. This new information will have to be communicated to the power supply experts. The action stays open.
2. There was no update concerning the document of procedures for WS settings for the injectors. The action stays open.
3. Concerning status of emittances out of the different rings for BCMS and recent measurements after injection into the LHC, K. Hanke commented that PSB Emittance is currently systematically logged. On Saturday 23/07 clear growth was observed from 1.2 – 1.3 to 1.5. Afterwards it was corrected on 31/07, however, at the time it could not have been verified in the LHC due to technical problems of the LHC injection kicker. It was only checked recently and found to be indeed OK. The action is closed.
1. Concerning the ISOLDE interlock monitoring of the intensity, target type, steering and focussing , there will be a detailed report on the following FOM. Meanwhile, the ISOLDE team will contact the Machine Protection Panel in order discuss most efficient and adequate solution that can be employed in ISOLDE. The action stays open.

2. Status of the machines

Linac2

M. O'Neil reported the status of the Linac2 (Annex 2).
The origin of the now lower intensity is not understood after the intervention last Thursday. Check for vacuum leaks did not reveal any problem. It was decided to change the cathode at the following technical stop, if it only survives until then.
During the weekend the source was tuned increasing the yield by 4%.
The availability was 97.9%. The interruptions were

- 2h for source vacuum tests
- 1.5h for 18kV transformer repair
- 35 minutes for replacement of tube in amplifier of Tank 3

PSB

K. Hanke presented the status of the PS Booster (Annex 3).
96.8% availability. The majority of the down time was due to Linac 2 interventions and small non-systematic issues.

ISOLDE

E. Siesling reported the status of ISOLDE (Annex 4)
GPS was stopped. HRS was using aluminium isotopes and is stopped for this week.
Issues:

- Short stop of the protons due to the LINAC2 intervention on Thursday morning, as well as a short stop this morning.
- The HRS separator magnets stopped cycling twice within an hour on Thursday but no further problems during the rest of the run.
- Minor issue with the beam instrumentation application that stopped working: A reboot of the front-end computer did the job.
- From time to time the SemGrid (both horizontal and vertical) in the BTY line does not trigger at the correct moment (we will discuss this problem with the SemGrid application specialist J.F. Comblin).

ISOLDE Users

K. Johnston: very happy users.

PS

R. Steerenberg reported the status of the PS (Annex 5).
With an average beam availability of 93% the PS had a good week for beam delivery to the different physics users. The down time was dominated by trips of some power converters and POPS. The latter are closely followed. Also the repair of a differential current measurement on the high voltage transformer supplying part of the LINAC, PSB and the PS caused some downtime. Wednesday morning the MTE beam was used during a dedicated MD to produce a high flux MTE beam with and without shadowing at the extraction region of SMH16 where the shielding was increased during LS1. The RP group conducted dose rate measurements to establish an is-dose map that they will compare to simulation. The results of the MD will be presented at the IEFC in the near future.
The SPS took ions on Thursday. The quadrupole in the TT2 line (F16.QDE217) trips regularly and the specialists of the TE/EPC group are working on it. The extraction septum still trips regularly on temperature.
All beam delivered successfully and with good quality, except the EARLY beam that developes oscillations after transition crossing.
Q. from D. Manglunki: What changed that F16.QDE27 trips now where it did not in the past?
A: It was tripping also in the past. Will try to reprogram the regulation curve of the power converter.

East Area

No report.

East Area Users

H. Wilkens: happy users. Many accesses to change orientation of the emulsion target in a magnet.

nToF

F.Mingrone: **A** new experiment is being setup and for this reason several accesses during the incoming week are planned. For example, the beam pipe in the experimental area will be changed.

AD

B. Lefort reported on the AD status (Annex 5)**.**
On Thursday C02 Cavity, that was giving a lot of troubles from the beginning of the year, became unresponsive. The diagnosis was difficult and inconclusive. The failing parts (filament power supply) have been replaced and it now works like a charm! Thanks a lot to Carlo Rossi for that! 7 hours were lost due to intervention.
During the week-end communication issues on the M1553 field bus that interconnect the DE0 power supplies occurred. No beam time was lost thanks to the fast & effective piquet intervention of TE-EPC-CO .
Comment from T. Eriksson: The MD time was used for Elena installation.

AD Users

H. Wilkens: ATRAP has problems because of a leak, and their share of beam was distributed among the other experiments, which were running fine.

SPS

D. Manglunki: reported the status of the SPS (Annex 6).
An average week for the SPS, with 86% beam availability.
On Wednesday 3/8 morning as the PS was in dedicated MD, the RF power team took the opportunity to work on TRX6 which was tripping several times during the previous night.
Wednesday 3/8 afternoon the SPS was in MD too (Active Halo Control with tune modulation). MD finished at 17:30 and fixed target physics resumed at 18:00 as planned.
On Friday 5/8 in the evening it was found that a feature of the demagnetizing cycling on the correctors can give problems on the following cycle in case the polarity is different. To be followed up. On Friday night started a series of problems on MKD. The ABT standby had to be called in and spend a great deal of his week-end on site, changing several thermoswitches, cutting cables, removing spark gaps. In total 7 hours of beam down time was due to MKD over the weekend.
Saturday 6/8 night the ion cycle was removed as it seemed to also start causing problems on MKD, with a missing distribution of the revolution frequency. To be followed up as it was fine before the week-end.
On Sunday 7/8 at 20:30 the mains tripped and the EPC standby had to call a specialist to help modifying the configuration, causing 2 hours beam down time. At the same time, EPC modified the configuration the quads power supplies, replacing QS by QF, making 10Hz and 60Hz modulations reappear on the spill structure. This was corrected on Monday.

North Area

B. Rae: There were some issues with HTTV, which is aging.

North Area Users

H. Wilkens: Changed the T4 target to increase intensity. It had to be changed back however as NA62 could not handle the higher rate at the level of the trigger.

HiRadMat

No report.

AWAKE

No report.

LHC

R. Steerenberg: Very good week with 3 fb-1 delivered. Today access.

Linac3

M. O'Neil
Overall good week, ovens were refilled and reached 30 μA beam. Pepper pot will be removed today, pumping down tomorrow and the beam should be back on Wed evening.
Q. from D. Manglunki: Was there any optimization of the source over the weekend that gave increase of intensity?
A: Yes.

LEIR

S. Jensen: (Annex 7) Smooth running. Issues encountered:

- Wednesday 17h42, 18h: All water cooled elements off in preparation of EN-CV intervention Thursday morning
- Wednesday 08h30, 30m: Change of switch allowing fast turn-off of e-cooler electron beam
- Wednesday 08h45, 20m: Change of cooling water pump
- Wednesday 10h49, 10m: ER.SMH40 unable to restart => A. Prost did local reset => OK
- Wednesday 11h14, 10m: Transverse damper vertical amplifier in water flow fault => reset/on => OK
- Wednesday 13h53: Septum ER.SMH11 in un-resettable fault
- Wednesday 18h49, 30m: LN3 down (power glitch ?)
- Wednesday 19h23, 5m: CRF41 down => restart => ok
- Sunday 00h55, 10m: ITL.BHZ02 (LN3) tripped => reset => OK

PS Ions

R. Steerenberg: The downtime is dominated by the problem with the F16.QDE217 (TT2 quadrupole dedicated for the ions) that frequently trips. The specialists are working on this issue. Also the ion beam lifetime in the PS is measured regularly, which on average is about 4 seconds. However, the measurements show quite some fluctuations, because the transformer signal is noisy with these low intensities.
As also already mentioned in the PS report the ion bunch/beam quality need to be improved as after transition quite some longitudinal oscillations occur, but this is work in progress.

SPS Ions

D. Manglunki: The ion beam started to be taken on Thursday 4/8 in TT10 and could only be injected only the following day due to wrong injection septum settings. RF is set-up until transition. The OP team kept optimizing the ion beam over the week-end. On Saturday night the ion cycle was removed as it seemed to also start causing problems on MKD, with a missing distribution of the revolution frequency. However, investigations on Monday could not reproduce the problem. Next Thursday, it is planned to take LHC ION PILOT beam
Comment: Trigger issue happened Sunday not Saturday.

CTF3

P. Skowronski (Annex 8)
Since 3 weeks only 3GHz beam is available due to 1.5 GHz source failure. Issues:

- Failure of CT.BHE0540 power supply (1h)
- Wed and Thu mornings: all klystrons very unstable, tripping every 5 minutes, did not find the reason
- Sat: klystron MKS03 max power interlock, needed local reset
- Mon: flow meter fault in the stabilized temperature water cooling, basically all day lost

There is a PHIN run in CTF2 for which a team of people will perform shifts in the CTF3 control room. Because they will also do shifts during the nights a for a limited period (until end of August), they kindly ask limited support from the PS island operations teams. The support request, including the procedures, was sent by email to PS operation (also in Annex 8).

TI

No report:

3. Considerations for anticipated LHC ion run

M. Bernardini
The LMC has requested to investigate if the LHC ion run could be anticipated by 1 week.
It would start on weekend 46 and last for four weeks. Similarly, the following program items would start earlier for the LHC: LHC Pb MD on 4 Nov and EYETS on Nov 5.
No changes are foreseen for the NA schedule . Marzia asked what the impact would be on injector activities and whether anybody would have any objections.
K.Cornelis: OK for the SPS.
D.Manglunki: It is even better, this way we won't have to set up the North Area primary ions at the same time as the LHC: the North Area setting up will take place as planned on 14/11 when the p-Pb run has already started by a week in the LHC.
K.Hanke: Does the end date for the protons in the booster change?
A: No
M. O'Neil: For how many weeks in total will the ions be required as the source refills may need to be rescheduled.
R.Steerenberg: The final decision on this proposal will be taken on the 31st of August
M. Bernardini: We need input by end of this week.
H. Wilkens: It is important for the AD, NA experiments and test-beams to keep the fixed target program at the injectors as currently scheduled.
RP representive: An RP survey after the stop of high intensity proton beams is needed and should be marked in the schedule.
M. Bernardini: Week 46 end of high intensity protons. 30h after the stop RP check will be scheduled. After the ion run there will be another survey.
V.Kain: If you any other remarks please send them within this week.

4. LHC MD2 Block beam requests

H. Bartosik In the most cases standard 25ns beam is requested.
The following special beams are requested

- Indiv, 7e10 ppb and 2.5 um emittances
- Indiv, 7e10 ppb and 2.5 um emittances, 4 bunches per injection
- Indiv, 2e11 and 2.5 um emittances
- Special, 25 ns, 6e10 ppband 9e10 ppb
- Standard 25 ns, 2e11 ppb, about 4um (or less), as close as possible to 0.35 eVs at PS extraction

Indiv beams can be derived from the VdM beams.

Q. by R. Steerenberg: You said standard 25 ns. So, not the BCMS beam.
A: Yes, 72 bunches per injection
Comment by H. Bartosik: In addition in 2 weeks we will need 2e11 per bunch for 25 ns for other injector MDs in about two wekks.
Comment by V. Kain: For the dedicated MD on Wednesday, once the SPS is in coast there will be one hour in the PS where the pole face winding will be studied that can degrade other beams in the super cycle.

5. Schedule Updates

V. Kain presented the latest version of the injector schedule. She pointed out that 2 weeks are left for preparation of the beams for the LHC MD.

6. AOB

No AOB

Next Meeting: 16th of August.

Minutes reported by P.K. Skowronski on 10th of August.

Summary of the 23rd FOM Meeting

Held on Tuesday 16th Aug 2016

Agenda (https://indico.cern.ch/event/562783/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule updates*
4. *Report on STAGISO BEAM for ISOLDE*
5. *AOB*

V. Kain chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.
There were 3 open actions (Annex 1),

1. There will be a dedicated presentation concerning the SPS QF ripple. The action stays open.
2. There was no update concerning the document of procedures for WS settings for the injectors. The action stays open.
1. Concerning plans for consolidating the surveillance and management of different beams in ISOLDE interlock system, a dedicated report will be given at point 4 of the agenda. The action stays open.

2. Status of the machines

Linac2

G. Bellodi reported the status of the Linac2 (Annex 2).
On Wednesday morning 2h were lost as arc current intensity in the source dropped to zero. The only alarm present was lack of discharge. Following, multiple flashovers were observed and HT tripped. It could have been provoked by missing gas. Than it gradually stabilized.
A steady increase of voltage on the cathode was observed, it is a clear mark of dying cathode. The heater voltage was trimmed down to keep it within the safe limits.
Comment from V. Kain: The topic of the Linac 2 source was discussed on the last IEFC. The plan A is clearly to change the cathode. It was requested to get prepared for scenario when it does not solve the issue. We will need to discuss this in one of the next FOMs.

A: All the checks were done and no problems were found in any of the subsystems. Therefore, there are no indications that the source is failing apart of the cathode.

PSB

J.-L. Sanchez Alvarez presented the status of the PS Booster (Annex 3.
Excellent week. One cavity had to be restarted.
The BLM system was moved from GM to FESA and it works fine.

ISOLDE

E. Matli reported on the status of ISOLDE (Annex 4)
All good. No major problems, availability 97.7%. Frontend stopped and electrode got moved into the GPS beam, resolved within 1h. Another 1.5h were lost due to a Faraday cup that got inserted. On Monday it was planned to change the target but it did not perform as expected, so the change was reverted.

ISOLDE Users

M. Garcia Borge: Easy beam, happy users.
Experiment successful. Gained in the end as the old, better performing target, was kept.

PS

A. Guerrero Ollacarizqueta reported the status of the PS (Annex 5).
80% availability.
30h of down time due to a vacuum leak at the location of one of the internal dumps. On Thursday morning the pressure rose to almost to 0.1bar in less than a minute. This lead to closing the valves of sector 40. RP, TE-VSC and the septa specialist were contacted. An intervention to find the leak took place along the morning. The leak was quickly spotted in SS48, the internal dump area, and EN-STI had to intervene too. Transport had to be asked to remove partly the shielding in order to localize the exact position and repair the leak, a difficult task given the high radiation levels in the area (>3mSv/h at contact). The leak was found to be in the vacuum flange downstream of the dump tank. After the exchange of the gasket, traces of an acrc could be clearly seen on the seal, pointing to an electrical issue as the origin of the breakage. RF intervened to check the RF bypass which was working correctly at the time of the measurement but which showed black traces on one of the contacts effectively suggesting a contact problem at some stage that would have blocked the current path creating arcs. The bypass was exchanged too. By the end of the afternoon the pumping could resume and a check in the evening showed that the leak was totally repaired. Early in the morning the pressure was checked again and the shielding could be mounted. Even if initially the pressure rose to high levels, vacuum specialists managed to keep the injection septum under good enough conditions so that finally the SMH42 did not need a bake-out that would have cost probably a 7 day stop. The beam resumed on Friday at midday.
Other issues during the week:

- POPS has tripped twice this week but could be easily restarted causing only 10 minutes down time each.

- On Tuesday a beam control stability issue in the double splitting of the BCMS beam affected the LHC filling foreseen in the morning. It was found that the old h28/42 switching (75ns beam) was affecting the distribution of the 20MHz cavity C20-92 return signal producing spikes in the phase loop.
- On Wednesday east beams were down during 45mn due to repeated trips of the extraction septum SMH57, the problem was found in one of the electronics card in the power supply.

On Tuesday the MD in view to produce an 80 bunch beam by destroying one h21 bunch by excitation with the transverse damper was successful

Q from kicker support: Wednesday early morning kicker system failed. Hot spare switched on automatically. Piquet was called at 4AM, even though the kicker was fully operational? Was it necessary to call the piquet immediately?
Q from V. Kain: RF bypass that caused the leak, do you understand why it happened? Could this problem recur? Does this flange have to be insulating?
A. by H. Demarau: It is a special bypass because there is very little space. There were signs of oxidations. We are still checking the issue and if it can be improved. Yes, the flange has to be insulating, the quadrupoles around it around grounded.

East Area

It was reported that the users are happy.

East Area Users

H. Wilkens: Happy users, ahead of schedule for the emulsion target of SHiP

nToF

F.Mingrone: We had 3 radiation alarms from the target and we did not understand what was the cause.
Comment by A. Guerrero Ollacarizqueta: The issue was that several elements in the line take far more than 900 ms for the ramp up. The supercycle has to be adjusted accordingly. It is a known problem but EPC do not have the resources to solve this now. So for the time being any kind of TOF beam after must not be programmed after an MTE beam.
More details: Some SSCs included an MTE beam (1BP with extraction at ~800ms) followed by an EAST beam with parasitic TOF. The TOF is extracted at a higher energy, but not all quadrupoles can cycle within 1000 ms.
Comment from R. Steerenberg: It is from past year, since the exchanged magnets are slower and do not follow the cycle. EPC will try to reprogram them, but it very difficult with these old power supplies.

AD

L. Joergensen reported on the AD status (Annex 5)**.**

Good availability, problems with power supplies: mains, ejection septum, electron cooler, in a VME crate. The last one made it impossible to acquire of half of GEM detectors, but the experiments found the way out by steering blind. Otherwise a good week.
Unexplained intensity fluctuations are observed for AD ejections with periodicity of 15-18 minutes. The origin is not clear.

AD Users

H. Wilkens: AEgiS, ATRAP and ASACUSA are taking beam this week. AEgIS ramped down it magnet and is taking beam on their second beam line for detector tests.
T. Erikson: Business as usual.

SPS

V. Kain: reported on the status of the SPS (Annex 6).
A difficult week for the SPS, with 73% beam availability. Main downtime due to the PS.
LINAC 2 caused 2 1/2 h SPS downtime Tuesday night. 3 1/2 h were lost from the MD time on Wednesday due to a vacuum leak at a gauge at position 514. The leak was repaired by tightening the flange.

- Another vacuum problem in TT20 close to the splitters lead to an anticipated stop of the Wednesday MD and a slight delay (30 minutes) for the restart with FT beam. A "window-valve" had moved in and could not be moved out remotely anymore. Access was required.
- Then about 30 h were lost from Thursday to Friday with the PS dump 48 vacuum problem.
- 1 1/2 h Saturday morning due to loss of communication with the controllers of the vacuum gauges close to the splitters, which lead to closing the valves and piquet intervention.
- 1 h Saturday night due to a problem with the RF revolution frequency distribution
- 6 h Sunday afternoon due to a faulty DCCT on the MST in LSS2. No spare was available so the experts switched to the DCCT that is used for the primary ion interlock. Replacement was ordered but has not arrived yet.

Since after the intervention on the mains last Sunday where the experts switched back to the QF power supply from the QS, the fixed target spill showed a significant ripple with intensity fluctuations of more than 50 %. Even switching back to the QS did not improve the situation much (noise now at ~ 30 Hz instead of 60 Hz). The ripple seems to be enhanced since last weekend. That is why 2 h without any beam needs to be negotiated with physics and/or MD coordination to re-optimize the regulation of the QF as well the QS power supplies. The EPC experts will available from end of week 33.
A vertical orbit change has been observed in the operational high intensity LHC cycle. The interlock levels in the extraction regions have had to be moved slowly down in the vertical plane by about 1 mm since end of last week. MICADO indicates the error source at 527. To be followed up.

Q. from M. Lamont: When did the orbit issue start?
A. by K. Cornelis: It started 30th of June.
Q. from M. Lamont: Do you know the location?
A. by K. Cornelis: Yes, it's 511
Comment from K. Cornelis: There will be a technical stop during which we will have to investigate it, as the error seems to be growing.
It seems that a magnet has moved by 1mm so far. The horizontal error is independent from the vertical, as vertical is clearly a movement of a magnet.
Q. from H. Wilkens: When the requested 2h stop to retune the QF regulation will be possible?
A. by V. Kain: We need to see when the specialist is available: end of this week, or beginning of the next one.
Q from H. Wilkens: We are allowed to increase the intensity for the FT beam since this week, right?
A. K. Cornelis: This what we did, but intensity from PS dropped meanwhile.

North Area

B. Rae: Good week, wire chamber was repaired.

North Area Users

H. Wilkens: Globally happy users.

HiRadMat

The ESScoat experiment had their first shift this Monday night. Quite smooth running. Unfortunately the intensity is too low for them. We can however not increase it due to SPS beam dump problem. (They are working with single bunches). They also had an issue with their "soft trigger". An access is required for this.

AWAKE

No report.

LHC

M. Lamont: Struggling, there was a panic concerning a dipole in S12 as it had developed an interturn short. After careful analysis and testing it was concluded that operation can continue until the Christmas stop when the magnet will be exchanged.
Additional bunches were put at the end of the trains.
Q. from V. Kain: What was the bunch intensity.
A. by K. Cornelis: It was 1.15e+11 ppb.

Comment from M. Lamont: Yes, it was too much. As the trains were elongated the vacuum in the injection kicker approached the limit.

Linac3

G. Bellodi: Oven was refilled what improved the intensity (35uA delivered to LEIR).

LEIR

D. Manglunki: (Annex 7)
Busy week. On Tuesday 9/08 in the morning, the LINAC3 was using the beam for its weekly MD and a water leak was discovered on the blade of the extraction septum ER.SMH40. The blade was changed during the day by B.Balhan/TE-ABT and the septum was again operational the next day. No time was lost for LEIR as the beam down time was completely in the shadow of the LINAC3 MD and subsequent source refill. The beam was back on Wednesday afternoon. However a vacuum pump (ER.VCH40- S5.VPCI1) had been sprayed by the water leak and will have to be fixed during the next source refill or Linac3 MD.
On Wednesday 10/08 morning another intervention took place on the transverse feedback, to place its power amplifiers were under PLC control, but the Xmotif application still controls the low-level electronics of the TFB.
On Wednesday 10/08 afternoon the LEIR patrol had to be redone as it was lost during a repair of the MAD.
On Thursday 11/08 morning the OASIS signals for both cavities were made operational. The beam was given back to the LINAC3 team for a dedicated MD as the PS was not ready to take it because of a vacuum leak.
On Friday 12/08 morning at 10:00, the power supply of the injection septum ER.SMH11 tripped, with no reset possible. The acquired current was nominal with the status OFF, indicating a controls problem. This was eventually solved by the EPC standby person, and it was possible to inject the beam from 13:00 onwards. The new optics were loaded for the first time on MDOPTIC on Friday 12/08 in the afternoon. Several times during the week, one of the trimming power supplies (ER.QFT23) tripped, causing one of the main (ER.QFN2344) to also trip.
On Saturday 13/08 morning the RF cavity ER.CRF41 tripped and could not be reset remotely. Also the new Low Level RF frontend cfv-363-allbc1 was giving errors. As in addition the frequency of the ER.QFT23 trips had increased over the week-end, it was decided to stop the machine completely. The EPC and LLRF specialists have been notified and asked to intervene first thing on Monday morning.
On Monday: LINAC3 MD in the morning (GB), beam back at 14:00. In the shadow the repair of vacuum pump ER.VCH40-S5.VPCI1 took place, sprayed by the water leak, restart of the LLRF crate, repair of switches & temporary fix on clamps on ER.QFT23 (TE/EPC).

PS Ions

A. Guerrero Ollacarizqueta: On Friday ions were sent to SPS. Before the PS vacuum leak the lifetime was around 4 to 4.5s. After the repair of the leak however there was not enough intensity

for sufficient accuracy of the measurement. The measurements will resume as soon as the ions are back to the PS. On Sunday it was measured 300ms.

SPS Ions

V. Kain: Due to difficulties in the SPS last week, the low intensity from the PS and power converter issues in LEIR essentially no progress could be made on the LHC ION PILOT cycle.

Q from T. Eriksson: Will the MD block next week be transparent for other users in the PS?
A. by V. Kain: Unfortunately, both MD coordinators are on vacation this week and it cannot be confirmed now. After the meeting it was communicated that there will be no dedicated PS MD.

CTF3

P. Skowronski (Annex 8)
1.5 GHz beam still not available because of one RF source failure and extended absence of the specialist. Power supply CT.BHE0540-S had to be entirely exchanged due to its recurring failures which took one day. Otherwise successful week.

TI

It was reported that there were no major issues.

3. Report on STAGISO BEAM for ISOLDE

In Isolde there are two targets, but three timing users. The configuration of line settings for a given target is done via Vistar Configuration based on timing users.
Two weeks ago an issue was reported at the FOM, where for the first time both targets were run with STAGISO beam. In the PSB STAGISO beam was programmed for GPS on the STAGISO timing user and also STAGISO beam on HRS, but the NORMHRS user. The interlocking surveillance however was only properly configured for STAGISO. Beam ended up on the target unintentionally, but it survived.
The ISOLDE beam proposes to now rely solely in all applications on the context instead of timing users. Another possibility would have been to have 4 timing users.

Comment from K. Hanke: We would need to sacrifice one of MD users in order to free it for Isolde, and we need them all.
Comment from V. Kain: This surveillance and its correctness is too critical to rely on timing users. It should be discussed with MPP to come up with an appropriate solution.
Comment from E. Matli: Instead of timing users, we should communicate LSA users directly.
Comment from V. Kain: The settings management for LHC collimators is faced with a similar issue, but safe solutions have been found.

4. Schedule Updates

V. Kain presented the latest version of the injector schedule.
The 24 h cooldown period before the September TS needs to be filled with low intensity beam time. Suggestions should be made.

5. AOB

Didier Chapuis requested maintenance for access doors. The email with request says different doors in the email title (AD Target YEA01.ADT=853) and in the body (nTOF YEA01.TFT=802)
If it is nTOF then it is not a problem. For AD also should not be. It needs to be clarified with Didier.
The intervention would be from Wednesday August 17 08h30 until Friday August 19 12h00.

Next Meeting: 23rd of August.

Minutes reported by P.K. Skowronski on 17th of August.

Summary of the 27th FOM Meeting

Held on Tuesday August 23rd 2016

Agenda (https://indico.cern.ch/event/563818/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule updates*
4. *AOB*

V. Kain chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved. Comments from D. Manglunki on the LEIR report were included in the minutes before the meeting.
There were 3 open actions (Annex 1),

1. QF ripple: **V. Kain**: Olivier has looked at the QF regulation. **C. Mugnier** is not aware of the outcome. **V. Kain**: this needs to come back as one also needs to look at QS. The action stays open.
2. There was no update concerning the document of procedures for WS settings for the injectors. The action stays open.
1. Concerning plans for consolidating the surveillance and management of different beams in ISOLDE interlock system, **E. Fadakis:** This was discussed within ISOLDE and with PSB, and requires more offline discussions. The action stays open.

2. Status of the machines

Linac2

D. Küchler reported the status of Linac2 (Annex 2).
It was an extremely good week (97.7 % availability). The cathode resistance is still going up.

PSB

A. Findlay presented the status of the PS Booster (Annex 3).

Availability was 94%.

On Wednesday, 30 minutes were lost for all beams with destination PS, as a DAC card in BTP.QNO40 had to be changed by the TE-EPC piquet.
On Thursday, 4h45 were lost for ring 2 beams due to a failing BT2.BVT20 TE-EPC piquet and TE/EPC_CO support fixed the problem by replacing the power supply.
At about the same time, BE.SMH15L1 also stopped the remaining rings and this was due to the cooling electro valve once again. The TE-ABT expert accessed and fixed the problem (2h10 min downtime).
On Sunday morning the LINAC went down due to the fire brigade having to hit the emergency stop due to a rack fire in one of the PS buildings. Jose took care of resuscitating the LINAC plus PSB, and he had the beam extracted from the PSB after 4h40 downtime.
MDs continued through the week.

ISOLDE

E. Fadakis reported on the status of ISOLDE (Annex 4).
It was a very smooth week at ISOLDE.
No serious issues to report.

ISOLDE Users

K. Johnston: it was a very good week. The leak this morning did not affect the users.

PS

A. Guerrero Ollacarizqueta reported the status of the PS (Annex 5).
87% availability.
The week was quiet and all beams were delivered as expected until Sunday morning. A fire in a rack of building 241 started around 7am. The firemen pressed the emergency stop so the 18kV were cut together with all the systems in PS. The TE-VSC piquet was called since there was no controls available on vacuum, and the pumps could be restarted by 11h. By 13h most of the crates were up and POPS could be restarted. TE-EPC piquet was called for several correctors too. EPC-CO was called for a septa power crate.

The MTE kickers could not be restarted and The TE-ABT piquet was called as well as E. Carlier. They had to bypass an equipment in fault to let the timing signal arrive to the kickers. The septa specialist, A. Prost, had to come twice for a temperature interlock issue of SMH57. LL RF piquet and HL RF specialist were called for the RF system. There were issues on the controls and three cavities could not be restarted once the controls over the equipment came back. The TOF beam could be finally injected by 18h30. The internal dumps were found not be fully out of the beam disturbing the injection of all beams. Single injection LHC beams and AD followed. The EAST beams were ready at 20h30 when the SMH57 interlock issue was solved. MTE came back with the kickers before 21h and finally the 2 injection LHC beams around 21h30 after a problem with the second LHC beam injection was found to be due to a wrong initialization setting that is not accessible from operational controls. All beams were back after 14h of beam stop. Several other equipment issues have been left

to deal with during working hours: orbit measurement and wire scanners among them. During the night First line had to be called to for a corrector and a bending in the east line.

The issue of MTE injection efficiency diminution in SPS mentioned last week has been found to be a problem of beam stability due to the intensity increase (threshold of stability reached at around 1100e10p), solved by using the transverse feedback at injection.

M. Calviani was not aware of the internal dump issue, and asked more information.
A. from A. Guerrero: the state of the dump was not correct, and it could be put back without calling EN-STI.

Q. from V. Kain: does the PS not use SIS monitoring? It would help to have something that says that all states are correct.
A. from A. Guerrero: no there is no SIS monitoring in the PS.
Comment from R. Steerenberg: the settings were wrong at the front end level and it is not sure if the alarm was properly propagated.

East Area

It was a quiet week.

East Area Users

H. Wilkens: it was a good week for the users.

nToF

"good", but lost 14 h on Sunday.

AD

B. Lefort reported on the AD status (Annex 6)**.**

The fluctuation with 15 min period reported last week are still not understood. It causes no downtime but it is annoying for users. Another modulation issue was solved by steering, and was linked to an issue with the phase when rotating the bunch. Maybe something is failing.

Q. to H. Damerau: was something found in phasing?
A. from H. Damerau: the initial radial position would give wrongly synchronized beam every 4 to 5 cycles. It was corrected yesterday at around 6:30.

AD Users

H. Wilkens: it was a good week.

SPS

K. Cornelis reported on the status of the SPS (Annex 6).

It was a pretty good week for the SPS.

In the beginning of the week the 10Hz ripple on the FT spill was rather bad, but it improved considerably towards the end of the week. There is still a 2h intervention needed on the QF in order to reduce the ripple, once the experts are back from holidays.

The vertical orbit at high energy keeps changing, mainly on the LHC cycle due to the lower tunes. It looks like QD5.11 is sinking slowly. 2 h would be needed to send geometers to check the position of that quadrupole.

Towards the end of the week we started the have more and more erroneous interlocks from the SIS, due to data published a cycle too late. It concerned mainly the BLM's in LSS4, UA9 collimators, and TBSE in TT20. Especially on Saturday things became really hectic and some 'non-essential' interlocks were bypassed. Experts finally found the reason for the data too old and interrupted: 2 SIS processes were running and subscribed to data. It is now fixed.

SPS was stopped for 4 h for specialist access after the vacuum increase in TIDVG. The allowed intensity was reduced to 25% yesterday, 50% this morning. Vacuum at the TIDVG is not critical by itself and the vacuum in the kicker is still good. Pumps give the same current as before, which means that there is still some operating margin. The vacuum slightly recovered.

M. Calviani: the vacuum increase was generated by a dump with 2e13 p. A few dumps had occurred at high intensity but this is the first one that had an impact. We decided to restart operation with 5e12 p and agreed this morning to go to 1e13 p, which does not limit LHC anymore. It will be seen this evening if one can go back to 1.5e13 p and tomorrow back to 2e13 p. There is no clear indication that the orbit has changed for the last dump and it could be a random issue. It is however good news that the vacuum is recovering again slowly. There is no other way to observe the situation of the dump than with this vacuum gauge. There is no plan to do anything during the technical stop.

V. Kain asked for the readiness of TIDVG4. **M. Calviani** answered that it is on track, and that the plan is to install the dump for the end of Feb. **K. Cornelis** asked about the spare. **M. Calviani** answered that the "spare" (sic) is in the workshop under dynamic pumping, and ready to go. He recalled that the TIDVG4 is on the critical path for the EYETS.

North Area

It was a good week except in H2, where a collimator is stuck. It is at the beginning of the line so one needs to wait for an MD for an access in TCC2.

North Area Users

H. Wilkens: it was a good week. Experiments still suffer from QF ripple and spill frequency content. 5e12 is really too low an intensity for the North Area, and he thanked operation for planning to go back to higher intensities.

HiRadMat

ESScoat experiment was finished last week successfully, except for a small issue with the soft trigger. A cable was disconnected. The next run is foreseen for mid-September.

AWAKE

No report. **K. Cornelis** noted that laser tests take place every afternoon.

LHC

R. Steerenberg: LHC had to anticipate the MDs due to problems with the ATLAS magnet. The LHC is now into the MD program. The ATLAS magnet could be back tonight, and physics would then restart tomorrow. All beams for the remaining MDs should be prepared.

K. Cornelis asked if there are MDs this weekend. R. Steerenberg answered that there are no MDs but added that 2.5 km commissioning would take place on Friday.

Linac3

D. Küchler reported for Linac3 (Annex 7)**.**

On Friday, the beam was only available after 9:00 because of an RF breakdown at Linac3 which had occurred the previous evening (one 48V power supply module on the debuncher). There can be no new debuncher modules so they need to repair them every time they fail. The situation is becoming difficult.
Oven refill will take place next Monday.

Q. from R. Steerenberg: what is the long term plan for these modules?
A. from D. Küchler: One cannot buy new ones and there are not many spares. **V. Kain** said that this should be looked into by the LEIR meeting. After the meeting, **R. Scrivens** noted that it will be followed up first with RF at the Linac supervisor meeting.

LEIR

D. Manglunki reported for LEIR (Annex 8)

It started as a good week for LEIR.

On Tuesday, the EARLY beam was not injected in the PS. It was found that the quads QDN10 and QDN20 in ETP had been set to zero current, probably collateral damage of the generation of the

MDOPTIC beam. In the afternoon once again the RF cavity ER.CRF41 tripped with no possibility of a remote reset, so it had to be restarted locally.

On Wednesday, the EARLY beam was delivered to the PS for the SPS dedicated MD.
Unfortunately, the SPS could hardly take it because of the LHC fillings.

On Thursday, the new controls for the transverse feedback were tested again, but until the programmer of the new Java app is back, the old Xmotif app will still be used.

On Friday, there was a fault on the injection fast bumpers (ER.DFH) from 13:00 to 14:00 which could eventually be reset remotely. The injected beam on MDOPTIC is almost completing a full turn with the new optics.

The power cut caused by an emergency stop button affected the whole PS complex on Sunday 21/08 morning. **D. Manglunki** thanked the PS operators who have called the vacuum piquet to check that the LEIR vacuum was preserved. After the return of the cooling water, most of LEIR could be restarted remotely, except for the electron cooler, the extraction kickers, the electrostatic septum and the extraction magnetic septum.

The relevant specialists were asked to intervene as soon as possible on Monday morning, and all was back in operation at 9:30. KFH31/32/34 needed an access (oil fault) and was fixed at 15:00.

ER.STP20 was blocked for a while and an intervention is planned for the TS.

Q. from R. Steerenberg: does building 241 supply the running machines, even Linac3, Linac2, etc.?
A. from D. Küchler: it stopped only the water station.
A. from D. Manglunki: it also stopped the vacuum for LEIR.
A. from H. de Maynard: the AUG is powered by the 18kV loop and therefore it is mandatory that the AUG stops power in all the loop to be sure that all nearby elements are cut. It was the same consequence with CTF, for which all the loop was cut.

Q. from D. Küchler: was the intensity increase from Linac3 visible in LEIR?
A. from D. Manglunki: not yet as the emittance seems to have increased as well.
D. Küchler did not agree and said that the brightness should have increased.
V. Kain: LEIR cannot profit yet from the intensity increase. It assumed that this is due to probably larger tails now without pepper pot.

PS Ions

A. Guerrero Ollacarizqueta: the ion life time has increased a lot since last week and has been measured around 3s as the vacuum gets better. Ions were sent to SPS for setting up again this week.

Injection at the PS is fine but there was a problem before the MD as some controls did not work as expected.

V. Kain: concerning PS injection with YASP, it is now in very good state and makes injection steering straight forward.
Q. from R. Steerenberg: is YASP steering for LEIR to PS fully operational?
A. from V. Kain: there are still some expert features to be made operational with J. Wenninger. A meeting will be organized afterwards to communicate how to use YASP now.

SPS Ions

K. Cornelis: dedicated MD organized to start setting up of long cycle, and should continue on Monday and Friday. Some time was lost due to the reshuffling of the LHC MDs.
The beam was accelerated through transition (an important milestone) and now experts are working on transmission.

D. Manglunki: we would like to have ions in SPS more often as there is a lot of room in the supercycle.
K. Cornelis: we are still doing MDs in LHC and we need to stay in standby mode for the MD. However if there are holes between LHC filling, one can try.

CTF3

No report.

TI

R. Ledru: there were 6 perturbations. After the fire alarm on Sunday, all came back from TI point of view within 10 min.

H. de Maynard reported on the electrical feeder issue that caused the fire alarm on Sunday (Annex 9).

Everything was done in accordance with the procedures and worked as expected (fire brigade intervention, AUG activation, electrical lockout, replacement of the feeder). The thermal overheating of ERD1.45*85 was caused by a faulty fuse connection clamp, that caused neighbouring plastic to melt. The replacement of the rack and cable reconnection took time. The intervention was over at 11:15.
This the first problem for this 20-year-old type of rack, and it is believed to be an isolated problem. Visual verifications will be made

V. Kain noted that all was done as it should and time cannot be gained.

3. Schedule Updates

V. Kain presented the latest version of the injector schedule.

Q. to T. Bohl: is the end of the week sufficient to finish the setting up of the short LHCion cycle ?
A. from D. Manglunki: no, it is not enough time and it will not be finished. This was already stated when that period was highlighted in the schedule. It was never assumed to be enough with 2 days per week for 4 weeks, especially with the frequent interruptions for LHC fillings.
T. Bohl agreed.
K. Cornelis: there is no reason not to continue.
V. Kain: the idea was to be finished to be able to study life time issues in the SPS afterwards.

V. Kain: the discussion of lists of impacts should start to be discussed next week due to the Workshop on physics beyond colliders. **D. Mcfarlane** agreed that it should be done both weeks to ensure that as many as possible have prepared their impacts.

ACTION: Please prepare and send impacts as soon as possible.

V. Kain: Concerning the cooldown for 24 h in week 37, it would be good to have ions, but we cannot define more precisely the planning for the 24 h low intensity time.
The source refill will take place before the technical stop.

H. Bartosik: the request to do tests of the flanges with beam tests before and after the installation is coming back for TS3. Either ions could take place and/or beam tests for flanges. This is however a problem as a coast is needed before and COLDEX is scheduled to start right after TS3. Karel proposed to do both ions and flange beam tests before, but the conflict will be after the TS.

D. Manglunki: in week 38, there will be no ions in the chain due to tests of several days of the TW tube amplifier. Beam will then be injected into LEIR to see if there are improvements. The last days of the week are reserved for roll-back, so he asked not to plan other MDs in week 38. Beam could be of course delivered to PS and SPS earlier if everything works correctly.

4. AOB

V. Kain mentioned the maintenance of access door YEA01.ISO=179 near the ISOLDE target, planned Wed for 24th 8:30 to 25th 17:00. **R. Froeschl** asked to have the information to know if it is ok for HSE-RP.

Next Meeting: 30th of August.

Minutes reported by B. Salvant on August 23rd.

Summary of the 28th FOM Meeting

Held on Tuesday 30th August 2016

Agenda (https://indico.cern.ch/event/565206/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *Dedicated MD Updates*
5. *Summary of impacts for injector's TS3*
6. *AOB*

1. Follow-up of the last FOM

V. Kain chaired the meeting.

The list of presence can be found in Annex 0.

R. Wegner commented the minutes of the last FOM concerning the Linac3 report. He said that, as agreed with operation, there is specialist support only during working hours. On Friday 19/08, the RF specialist came in at 8:30 and the Linac3 beam was back at 9:00. There is one spare amplifier for the particular type of amplifier on which the problem occurred (Dressler amplifier) for a total of 3 running. Spare components are available to repair broken amplifiers. However, as the amplifiers get older, the number of interventions increases. It was therefore decided to renovate the Dressler amplifiers in the framework of the "Bertronix partial renovation" activity.

The minutes of the last FOM were approved.

2. Status of the machines

Linac2

R. Wegner reported the status of the Linac2 (Annex 1). Overall a good week, with still some concerns about the source. Given the cathode resistance increase over the last two weeks, it was decided to decrease its heating current. PPM source intensity fluctuations started to occur during the week-end and were much reduced yesterday evening by parameters fine tuning. The plan is still to exchange the cathode during the next technical stop.
R. Scrivens added that a dedicated meeting will be held on Friday with source experts to set-up the list of next investigations/checks.

GP. Di Giovanni asked how much time a cathode replacement would require in case it breaks. **R. Scrivens** answered that it would require 24 hours.

PSB

A. Findlay presented the status of the PS Booster (Annex 2). A very good week with 99.2% availability. Apart from the Linac2 source intensity fluctuations already mentioned, the only major downtime to report was due to a power glitch on Friday morning that affected the operation for 20 minutes.

ISOLDE

E. Sielsing reported the status of ISOLDE (Annex 3). It was a pretty good week on GPS with some minor downtimes. HRS was in standby until Thursday when the target was changed. A few issues occurred during the change: The target #579 did not unclamp easily. Somehow the target unclamped at the moment they opened the shutter again for a second unclamping sequence. The target valve closed by itself and the target was arranged on the shelf and after re-closing the shutter by using the intervention settings the target #573 could be clamped. However, the used target #573 showed a leak when trying to pump the sector. Tests were done on Friday with another target to exclude the HRS front-end from having a leak. Another production target was successfully mounted yesterday on the HRS front-end for the upcoming run.

V. Kain asked if the reason for the target leaks were known. **E. Siesling** answered that this is certainly due to the fact that they are quite used targets.

ISOLDE Users

K. Johnston said that the week was perturbed by the issues on HRS. Nevertheless, beams were excellent when available.

PS

H. Damereau reported the status of the PS (Annex 4). A good ween with 95.6% availability. The only major downtime was caused by the vertical wire scanner SS85 which did not move back to its home position due to a power supply issue. On Tuesday evening the AD and TOF beams had therefore been stopped during 1h40 for investigations. An access to move the wire scanner back manually has been organized on Wednesday morning during which the broken power supply was exchanged. Despite the smooth access of about 1h30, POPS could not be restarted thereafter, requiring an intervention by the power piquet. An interlock from a cooling ventilator prevented the restart and was found to be caused by a circuit-breaker supplying the fan. The total length of the beam stop for wire scanner and POPS interventions was about 3h00. An intermittent fault of the 10 MHz cavity C10-86 is under investigation and the anode power supplies of C40-77 and C80-08 had to be swapped on Wednesday afternoon. All 40 MHz and 80 MHz are now available.

Various beams were prepared for PS and SPS MDs: 8b4e, bunch rotation with both 40 MHz cavities, 2 bunches spaced by 100 ns for PS ion MDs.

A. Bland confirmed that a very large networking intervention was planned on Saturday but it does not explain why DIAMON lost the connection.

C. Mugnier confirmed that the TE-EPC controls piquet has to be called by the TE-EPC power converter piquet and not by the operators such that he can then get relevant and detailed information.

East Area

B. Rae said it was very good week. Just had some magnet trips in F61 on Saturday night.

East Area Users

H. Wilkens said that the users were happy.

nToF Users

D. Macina said that the users were happy.

AD

C. Oliveira reported the status of the AD. The machine had two major issues this week. Wednesday early morning, a fault on a water flow sensor (mechanical switch had to be replaced) on the C02 cavity entailed a beam stop of about 8 hours. Wednesday at 11:00, the power supply of the DR.QUAD-TRIM2 went down. The First-Line started their intervention at 14:00 and finally called an EPC specialist at 18:00. Due to consecutive working hours limit, they had to stop at 21:30 and came back on Thursday morning. The problem was solved on Thursday afternoon at 16:00 and induced a beam stop of 26 hours.
C. Mugnier commented that the 26 hours needed to solve the issue with the power supply is the result of an unfortunate sequence of events: Not well known and documented type of power supply, consecutive working hours limit… Nevertheless, the intervention time could had been shortened if the expert had been called earlier by the first line. He reminded that CERN rules are limiting to 12 hours the working time per day.

AD Users

H. Wilkens said that the week was good for the users. The Alpha experiment noticed a new 3 to 5 MHz noise in the building whose origin is not known yet.

V. Kain asked if they observed again a 15 minutes period intensity fluctuation. **C. Oliveira** answered that it was not an issue this week, but that it has not disappeared.

SPS

D. Manglunki reported the status of the SPS (Annex 5). The SFTPRO intensity limit was raised to 1.5e13/cycle on Tuesday after the vacuum pressure increase on the beam dump beginning of last week. On Wednesday morning, there was an access in BA5 to understand the reason of the vertical orbit distortion increase. It was found that one of the three jacks supporting QF50610 had collapsed by

4mm due to a deteriorating polyurethane ring. The jack will be replaced during the technical stop but it was decided to produce and install new temporary supports (installed on Friday). Following the LMC, the SFTPRO intensity was raised again to 2e13/cycle on Wednesday at 15:00. Intensity from the Linac2 became unstable over the week-end. It was therefore decided to decrease the SFTPRO intensity to 1.6e13 in order to limit the number of dumps and avoid pressure increase on the TIDVG. Intensity was back to 2.1e13 on Monday morning.

North Area

B. Rae said it was a pretty good week with only minor problems. As already said, the Linac2 intensity was unstable over the week-end. They started to decrease the T2 intensity this morning in order to allow for an access tomorrow morning during the dedicated MD.

North Area Users

H. Wilkens said that the users were happy that the nominal intensity is recovered. The Compass and NA62 would now like to get the two cycles per supercycle as soon as possible.

HiRadMat

B. Rae said there was nothing special to report.

AWAKE

There was no report.

V. Kain said that the cycle will be back next week, on Tuesday, in the supercycle in order to get the timing events for the planned dry run.

LHC

R. Steerenberg said that the LHC MD program was completed during Wednesday night and was followed by physics runs and setting up of the 2.5 km beta star optics. Friday afternoon a slow abort of the main bends occurred in sector 1-2, the sector containing the magnet with a potential inter-turn short circuit, meant that over 6 hours were needed to ramp down. The weekend as well as Monday were very successful and around 1.5 fb-1 could be accumulated with over 60% of the time in stable beams. This means that the target of 25 fb-1 has been reached for both CMS and ATLAS. This week as well as major part of next week is 'standard' running for physics.

Linac3

R. Wegner reported the status of the Linac3 (Annex 6). He said that the ovens refill took place yesterday and it was presently quite difficult to get the nominal intensity back from the source. **D. Manglunki** confirmed that the next source refill is scheduled during the technical stop.

LEIR

S. Jensen reported on the LEIR status (Annex 7). I was a pretty good week mainly dedicated to resonances studies with few minor faults. The leak on the SMH40 manifold was temporarily fixed until the TS3.

PS

H. Damereau reported the status of the PS. Investigations on the longitudinal emittance blow-up are on-going. Measurements are made difficult by issues with the tomoscope. The first thing is now to solve the observation problem. Next week, the beam will be taken for 1 day for measurements and no beam will therefore be available to the SPS. The lifetime at injection energy is 3 sec.

SPS

D. Manglunki reported the status of the SPS (Annex 5). Single bunch and 4-bunch trains were accelerated on the short "pilot" cycle. Fixed target beams commissioning is starting with some constraints: ZS interlock needs masking, LSFB sextupole problems in beam out segment. The MD ion fixed target cycle will be used for further commissioning (containing no extraction particle transfer).

V. Kain added fixed target cycle will be added in the super cycle on Thursday or Friday.

CTF3

There was no report.

TI

R. Ledru reported 2 major events. On Friday, an intervention on the Swiss network entailed a perturbation on the 130 kV network. Since yesterday, there is an issue with the BEQ2 compensator. Investigations are on-going.

Next week, form Mon. 5/09 to Wed. 7/09 SPS and CCC generators tests will take place without (normally) any effect on operation. **A. Bland** commented that these tests should be interrupted in case of access. **V. Kain** confirmed that TI will stop the tests in case of access. **R. Ledru** added that the tests will take place only during working hours.

3. Schedule updates

V. Kain presented the injector schedule v 1.7 (Annex 8).
The reference measurements before the SPS soft clamp installation with single bunch will take place during the ITS3 cool-down period. The COLDEX run has been moved before the technical stop and will start at 8:00 on Monday morning for 24 hours. Ions will be kept running in the SPS during the cool down. M. Lamont will update the schedule. A decision on a possible anticipation of the LHC ion run will be taken tomorrow at the LMC.

4. Dedicated MD updates

H. Bartosik confirmed the dedicated MD will take place tomorrow. During the SPS MD, no beam will be available for the North Area.

5. Summary of impacts for injector's TS3

C. Mastrostefano presented the list of Linac2 and Linac3 Impacts (Annex 9, Annex 10). They are mainly usual inspections. A vacuum pump on DTL tank3 might have to be be replaced. The source cathode will be replaced and the source be vented. Beam to PSB is not expected before 16:00 on Thursday.

D. Mcfarlane presented the list of PSB, PS and SPS Impacts (Annex 11, Annex 12, Annex 13). The Booster Impact from SMB group requires working under the false floor. R. Steerenberg will check if everything is well organized and report to the FOM next week. In the PS, among usual inspections and visits, 5 requests were highlighted (PS PU25 repair, Linac3 TL alignment, demineralized water for magnet intervention, intervention sur le puisard and leak detection SS6 in PR10 vacuum sector). For the SPS, 3 Impacts were especially mentioned: The Telemax intervention in BA1, the carottages and the QF50610 jacks replacement in BA5. As he received half of the Impact number usually requested for the technical stops, **D. Mcfarlane** said that he suspects that more would come in the coming days. No Impact concerning the softclamp was received.

6. AOB

The maintenance of the YEA02.TFT=801 door (nToF cooling station) is scheduled from Wed 31/08 at 8:30 to Thu 01/09 at 17:00. **D. Macina** added that they will have no access during the maintenance.

Next Meeting: Tuesday 6th September 2016.

Minutes reported by JB. Lallement on 31st August.

Summary of the 29th FOM Meeting

Held on Tuesday 6th September 2016

Agenda (https://indico.cern.ch/event/566868)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *The plan for the Linac 2 source for the technical stop*
4. *Schedule updates*
5. *AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in Annex 0.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.
There were 4 open actions (Annex 1),

1. Concerning the SPS QF ripple **C. Mugnier** said that probes would be installed on the magnets to identify grounding issues. The action stays open.
2. Concerning Wire Scanner setting for the LHC logging **B. Mikulec** said that a dedicated meeting was held and it was decided to postpone the resolution of this action to the next year. Measurements over the full intensity range will be conducted towards the end of the run with the aim to define recommended settings by then. The action stays open.
3. Concerning plans for consolidating the surveillance and management of currents, targets and intensities in the ISOLDE interlock system, more time is needed to find an adequate resolution. The action stays open.
4. Preparation of Impacts of injectors for TS3 will be discussed at the end of this meeting. The action can be closed.

2. Status of the machines

Linac2

R. Scrivens reported the status of the Linac2 (Annex 2)

- 98.8% availability
- 30 minutes were dedicated for tests concerning the source fluctuations
- 102 minutes to fix LA3.QDN15S power supply

- Voltage of the cathode is still rising; the hope is to survive until the upcoming TS

PSB

G.P. Di Giovanni presented the status of the PS Booster (Annex 3).
PSB had 95.8% availability.

There was an issue with resetting kicker BE1.KFA14L1 and piquet intervention was needed. Remote reset worked finally.

Synchronization jitter at extraction improved with new phase pickups. They should be put in operation soon after additional checks at PS injection are completed.

ISOLDE

M.L. Lozano Benito reported the status of ISOLDE (Annex 4).
The availability was above 98%.

HRS shared its time between ISOLTRAP and COLLAPS. They both took beam without major problems. On GPS a new target was installed on Friday afternoon. This target will be used this week for the first HIE-ISOLDE run of the year. REX-ISOLDE started delivering stable beam (from residual EBIS gases) to Miniball at A/Q=3.67 and full normal conducting energy (2.85 MeV/u). Few trips of some normal conducting cavities. Some timing issues, not understood, but fixed now.

ISOLDE Users

K. Johnston: Straightforward before the start of HIE-ISOLDE. This week is dedicated to HIE-ISOLDE. There will be a special request for the cycle arrangement until the TS3.
Comment from B. Mikulec: This request is quite difficult in terms of super cycle composition. With the help of R. Steerenberg special super cycles have been proposed; the operators of PSB, PS and SPS are asked not to modify the ISOLDE cycle arrangement within the super cycles for the time being.

PS

R. Steerenberg reported the status of the PS (Annex 5).
The average beam availability was 94%. The main problems in the PS were power converter related.

On Monday one of the PFW circuits tripped and could not be reset what caused 2 hours and 15 minutes downtime for all users.

POPS tripped on Tuesday and Friday resulting in a total of 70 minutes of downtime.

The C91 10 MHz cavity was replaced with a spare one.

Following high losses in the LHC due to the satellite bunches that in large part are due to uncaptured beam at injection in the SPS tests were made during the week to use two instead of one 40 MHz cavities in the PS. Friday morning this was put in place operationally before the LHC filling. The losses in the LHC during injection dropped from about 40% - 50% of the dump threshold to a few percent. It also gave rise to the LHC peak luminosity record that was measured at 1.33 10^{34}, as more protons are captured in the bunches. This means that there is no more spare 40 MHz cavity available, but in case of serious problems with one of the 40 MHz cavities, the operations team has a procedure to switch back to the situation with only one 40 MHz cavity.

Comment from B. Mikulec: The LHC luminosity record might be a combination of the nice gain due to the 2 40 MHz cavities, but also of the Linac 2 source tuning that led to a Linac2 current increase and subsequently brighter beams from the PSB.

East Area

B. Rae: Good week.

East Area Users

No report.

nToF

F. Mingrone reported a good week for nToF. She inquired about the exact stop of the proton beams before the TS3.
A. by B. Mikulec: It will be discussed in detail later on during this meeting.

AD

L. Bojtar reported on the AD status.
There was an orbit jump that provoked total beam loss and took 4h to recover.

AD Users

No report.

SPS

K. Cornelis reported the status of the SPS (Annex 6).
Very good week with 93% availability.

Wrong blow-up setting, due to which it was difficult to transfer the beam during a >3h period.
MDLV2402 tripped twice, came back by itself, OK since then.
8 QF magnets were equipped with monitors in search of the grounding issue.

Question from B. Mikulec: Concerning the use of both 40 MHz cavities in PS, is there is a plan to build another spare in the future?
A. R. Steerenberg: No. It was discussed with other users and the current setup is fine with them.
H. Damerau: We should first try to run like this and gain operational experience and statistics. It will be kept only for LHC, as it is irrelevant to the rest of the users.

North Area

B. Rae: Very good week. We opened the collimators in H2 after the issue that they were blocked; this is being followed up.

North Area Users

No report.

HiRadMat

B. Rae: HiRadMat will be ready for the upcoming run.

AWAKE

E. Gschwendtner reported the planning for AWAKE (received by e-mail, slides in Annex 7)
Tuesday, 6 September, there will be a dry-run for the experiment control and therefore the AWAKE cycle is needed in the SPS super cycle, no beam though. During the Technical Stop 3 the main dipole heat tests (for which LHC access is needed) will be done, lasting about 2 days. In week 38 and 39 proton beam line, laser, RF synchronization, experimental detectors commissioning is scheduled.

LHC

R. Steerenberg reported for the LHC (Annex 8).
Reduction of losses is very much appreciated. On Sunday there was a good, lasting 24h fill, which delivered above 0.55 fb^{-1} for both CMS and ATLAS. Yesterday there was a VIP visit in the tunnel.

Linac3

R. Scrivens reported (Annex 2) that the refill of the Linac 3 oven was quite tricky, and also the restart was difficult. During last week many manipulations were needed to stabilize the delivered intensity, and still it was far from satisfactory. The 2nd oven is already in use. An oven refill might be needed before the TS.

LEIR

D. Manglunki: (Annex 7).
Short but good week with 97% availability. Short because of the Linac 3 oven refill.

- Several interventions of TE/EPC were done in the shadow of the refill.

- Leak on the manifold for water cooling of the extraction septum ER.SMH40 was temporarily fixed. A definitive repair will take place during the technical stop
- ER.QFT23 that was tripping very often; eventually fixed last Wednesday, no single trip since then
- Problems with ER.ECNSC20 since Friday; frequent trips, sometimes non resettable

Beams:

- NOMINAL: Ready for PS to optimize the 4 bunch beam with 100ns spacing, which will be used during the p-Pb run in November
- EARLY: Sent to SPS on Thursday & Friday for fixed target beam commissioning, and to the PS for regular lifetime measurements.
- MDNOM: G.Franchetti is visiting from GSI, working on resonance compensation
- MDOPTICS: Test of the new working point, below half integer. Beam has been injected and is circulating. Potential for performance will be assessed in the coming weeks.
- ANOMINAL: Studies of instabilities/impedance model

There are doubts on the skew component of the combined functions sextupoles. A measurement campaign is being planned.

There will be no Linac 3 MD this week (Sep 5-11).

There will be no beam for LEIR during week 38 due to TWTA tests in Linac 3.

PS Ions

R. Steerenberg:

1. The LHC nominal still shows phase oscillations after crossing transition what brings the longitudinal emittance above the specifications
2. Lifetime is around 3.5 s, what approaches 4 s from the past

C. from **D. Manglunki**: It would be good to have nominal beam ready for next week.

SPS Ions

K. Cornelis: No special remarks.

CTF3

P. Skowronski reported the CTF3 status (Annex 8).

No major issues reported, although still the operation is limited to the 3 GHz beam due to failure of a 1.5 GHz TWTA. The faulty module of the TWTA was identified and was shipped to the manufacturer for repair.
For all the week the optimizations and studies of the factor 4 recombination in the Combiner Ring were done, as CLEX was open to switch back the RF and the laser system from the PHIN to CALIFES.
For the weekend the cooling water was stopped in order to find a leak, because over 3 m^3 were lost during the previous week.
On Monday morning all the zones were open for access for

- Check for leaks that are often provoked by water on/off
- Change and regulation of MTV cameras
- Several other minor checks

The beam was restarted without major problems during the afternoon.

Q. from B. Mikulec: Is the CTF3 program on track for its completion by the end of the year?
A.: Most of the program was completed and we would like to deliver the refined final results. However, most of them (namely Two Beam Module with the nominal RF power and deceleration tests in Two Beam Line) require factor 8 recombination that currently is not available due the TWTA failure. Hopefully it will be soon repaired. Currently we work on minimizing the combined beam emittance, which we would like to be at 150 mm mrad, while it is closer to 400 mm mrad.

Q. from L. Soby: When can we start dismantling and recuperating hardware from CTF3?
A.: The drive beam operation definitive stop is planned on Dec 15. However, contrary to all the rest of the CERN accelerators, it is not 100% owned by CERN, as a large part of CTF3 was built by the collaborators. Therefore, the decisions must be made by the CTF3 Collaboration Board. Requests have to be sent to R. Corsini mentioning the concerned hardware components.

TI

No report.

3. Linac 2 source

Intensity of the source is dropping and at the moment is 25% lower compared to the nominal value. Cathode resistance is constantly increasing, which is a bit worrying, as normally it should be stable. Also the rate of flashovers is higher reaching up to 30 per day. There were 2 vacuum leaks with this cathode what is likely to degrade it. There also might be a problem in the extraction region that leads to flashovers. It is observed that the intensity increases after flashovers, what was not observed in the past.
Therefore, it is proposed to change the electrode during the TS.

All the planned interventions fit within the 36h stop.

There are more elements that could be changed, but it would increase the duration of the intervention to 52 hours because it would require more work to assembly and more vacuum checks.

A new full spare source is under construction. It is scheduled to be completed in 6 weeks. It should not be put directly into operation since there is high risk that it might not work right away.
This new source has 6% larger aperture.

It is planned to be installed for tests the first day after the stop of Linac 2. Therefore, Linac 2 will be running for 4 days longer (Monday – Thursday). Starting from December 15 until December 31 it will run at 90 kV only to its beam stopper. It needs CO, BI, ventilation, power, vacuum services operational. An email was sent to the respective service managers asking for comments and no objection was received until now. Any eventual comments should be sent during this week before the subject is discussed in the IEFC next week.

Comment from A. Bland: There is a scheduled stop of the Control Services on the beginning of January. An eventual alternative period for the source tests needs to start afterwards.
Comment by M. Gourber-Pace: We need a complete list of CO services that are required during the shutdown, especially during the end of the year laboratory closure.
Question from R. Steerenberg: Is it planned to run 24h a day, or 8h a day? During the shutdown the operators are present only during normal working hours.
A: The source will run 24h/day. We require only a timing cycle in place. Outside working hours, and during lab closure, the TI operators could cover our needs.
Question from R. Steerenberg: In case of a problem, do you need to discard the 2nd part of the tests?
A: We will know that something is wrong right away after starting the device, and we hope we have enough time to fix it before the laboratory closure.
Question from F. Pirotte: Is the source an EIS, do you need new procedures to define and test?
A: The EIS capabilities are needed only for beam stopper, so nothing changes in this respect.

4. Schedule Updates

B. Mikulec presented the latest version of the injector schedule. A new schedule was approved in the IEFC. For the injector schedule the COLDEX run was reshuffled, the LHC ion operation advanced by one week.
Comment from AD: Also a p prolongation for AD was approved.

5. AOB

Concerning the preparation for the Technical Stop next week, there are the following updates with respect to the schedule presented past week.

PS and **TT2** information reported by **S. Mataguez**: There are 10 more IMPACTs, only for visit and inspection; one is for the maintenance of the TT2 lift. It is agreed with OP and the LINAC3 facility coordinator to make a blind access for the SWY from ~8.30 to ~9.30 for the installation of a BCT in the ITH line. During the blind access, the access to the area will not be authorized.

C. Mastrostefano reported that in LINAC 3 was added replacement of the ITH BCT 41 (new BCT, ITH sector vented).

For the **PSB** there was no update. The main duration-determining intervention concerns the wire scanner exchanges.

D. Macfarlane reported for the SPS: 93 IMPACTs were created in total. Almost all are for general inspections. One vacuum intervention. Accesses will start from Wednesday 8.30 until Thursday 4PM, when everyone must be out at latest.
Comment from K. Cornelis: We need to put clamps on the magnets; in case they disturb any of the beams we have to remove them immediately during the night, therefore all kind of beams need to be tested in the evening and restart with beam is expected at 4PM.
Comment from R. Scrivens: These adds constraints for the Linac 2 source to be operational already some time before 4PM.

R. Froeschl explained the cool-down times requested by RP after analysis of the IMPACTs received.

A summary of the deduced beam stop and restart times as well as the timeline for the COLDEX run is given below:

COLDEX (SPS):

- Stop all beams in the SPS at 8:00 on Monday 12/09
- Access for COLDEX at 8:30 after 1/2h cool-down time
- Stop all beams in the SPS on Tuesday 13/09 at 09:30
- Access for COLDEX at 10:00 after 1/2h cool-down time
- After COLDEX has been moved OUT (at ~11:00) continue in the SPS with low-intensity reference measurements (soft clamp installation during TS) and/or ion beam setup

PS, PSB, SPS:

- Stop all high-intensity or high-loss beams (namely EAST area beams, ISOLDE, nToF, AD, SFTPRO) on Tuesday 13/09 at 15:30 (16h cool-down time requested by RP)
- Stop all remaining beams except ions on Wednesday 14/09 at 4:30 (3h cool-down time requested by RP)

- Stop ion beams on Wednesday 14/09 at 06:30 (1h cool-down time requested by RP)
- Prepare machine access (ventilation flush to be done in time to be finished at 7:30)
- On Wednesday 14/09 RP measurements start in the machine from 7:30
- Once the RP measurements are finished, the interventions can start in the different machines (from ~8:30) except for the PS
    - PS: A '**Blind Access**' has to be made before giving access to anybody else; the blind access is organised from Linac3 to transport some material to the ITH line. The material exit is to be done at the end of the TS once everybody else has left the machine. This is to avoid a full patrol of the PS.
- Beam should be back in all machines on Thursday 15/09 at 16:00. The machines should restart as soon as possible once all the interventions finished.

General reminder from RP:
During the cool-down period cycles should be restricted to the minimum necessary and unnecessary beam dumps avoided.

Reminder from CO:
During the TS Controls Upgrades will take place that affect potentially all machines and experimental areas.
A comprehensive list of the planned CO upgrades can be found at the following link: https://wikis.cern.ch/display/SUWG/TS+2016-09-12+Preparation

Comment by R. Scrivens: At 8AM we start tests of the Linac 2 source and we need controls operational for this.
Comment by M. Gourber-Pace: For us the Technical Stop is to update all the sub-systems and it is pity nobody from the Linacs was present yesterday at the dedicated meeting to define the times and minimum services needed.
It was agreed that the minimum Linac 2 requirements should be discussed outside the meeting to try to find an arrangement.

Comment by **J. Rodriguez**: HIE-ISOLDE would like to run offline during the TS.
It was clarified that the Controls Upgrades need to be performed during Technical Stops and that controls interruptions/perturbations have to be accepted.

Next Meeting: 13th of September.

Minutes reported by P.K. Skowronski on September 8.

Summary of the 30th FOM Meeting

Held on Tuesday 13th September 2016

Agenda (https://indico.cern.ch/event/568386/)

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The list of presence can be found in Annex 0.

Comments from **R. Scrivens** were added to the minutes of the last meeting. Minutes were approved.

R. Scrivens added that the Linac2 run will be extended for tests at the end of the 2016 proton run for 4 extra days. The proton source will be kept running until the end of 2016. He contacted groups concerned by this extended run, but did not receive any feedback excepted from EN-CV (OK for them). Discussions with BE-CO are ongoing. There were no objections from any of the meeting participants. The extended run proposal will be presented at the IEFC. **A. Bland** commented that there could be some emergency stop tests during this period that could affect the linac/source operation; **R. Scrivens** said that he would follow this up.

There were three open actions (Annex 1).

1. Concerning the SPS QF ripple, **C. Mugnier** said that some measurement points will be installed during the technical stop in order to identify the grounding problems. The action stays open.

2. Status of the machines

Linac2

R. Wegner reported the status of the Linac2 (Annex 2). It was a very good week with only two minor faults (25 mins in total, 99.8% availability). The source cathode resistance is constantly increasing, illustrating its slow deterioration. It will be replaced during the technical stop.

PSB

K. Hanke presented the status of the PS Booster (Annex 3). It was a very quiet week. The only significant down time (1h38) was noted on Thursday when the C02 cavity of Ring 3 needed an expert intervention (two capacitors changed). On Friday there was an issue with BT.BHZ10, which could be traced down to a missing synchro signal from the PS. Also on Friday there were 30 min of degraded operation for ISOLDE due to a steerer at ejection not following the ccv value. The problem disappeared by itself without having been understood.

ISOLDE

J. Alberto Rodriguez reported the status of ISOLDE (Annex 4). Last week was the first HIE-ISOLDE experiment. The run was smooth until Friday when the RFQ started to trip quite often (23 trips since Friday). A LLRF module linked to the interlock will be replaced by the RF team today (tube was already replaced, but it did not solve the problem) and will hopefully solve this issue which is not yet fully understood. The target line heating tripped on Friday evening. **B. Mikulec** asked if the special supercycle was only linked to the commissioning or might risk to be re-requested in the future. **K. Johnston** said it was exceptional for this first HIE-ISOLDE tin run, and understood it is a complication for all machines. Such a request will stay an exception.

ISOLDE Users

K. Johnston said that users were very happy and it is was a good start of the 24/7 HIE-ISOLDE run. Thanks to the effort of the commissioning team, delays due to the setting of the superconducting RF cavities were absorbed and the impact on the experimental schedule was limited to only one day.

M. Lamont said that the directorate sends congratulations to the ISOLDE team.

PS

M. Fraser reported the status of the PS (Annex 5). It was a very good week for the PS with 94% availability: only a few minor faults caused small amounts of downtime. The largest part was attributed to cavity faults in the PSB and PS. On Friday morning an intervention was made to fix a water-cooling problem on the C86 (10 MHz). As the cavity tripped again last night, it will be checked during the technical stop. POPS tripped 4 times and could be restarted within 20 minutes the three first times. Last night, a specialist reset was needed ("pre-charge contactor" tripped); will need follow-up if it occurs again. Throughout the week a fault on the cooling circuit of the internal dump TDI48 appeared intermittently. In agreement with EN-STI, and as a precaution, it was removed from operation whilst further investigations are made, including an inspection during the upcoming Technical Stop. TDI47 was invoked and operation was unaffected.

East Area

B. Rae said it was a very good week.

East Area Users

H. Wilkens said that it was a good week for the users. The Beam line for school teams arrive tomorrow. Experiment visit are scheduled on Friday in the presence of Poland and UK ambassadors. They will start taking the beam on Saturday.

nToF Users

D. Macina could not be present at the meeting. She sent a mail with the following information: *We have noted the long technical stop and we have adapted the planning accordingly. We will be ready for beam on Thursday afternoon and we will have a few accesses in the week end as we will change experiment in EAR1.*

AD

T. Eriksson reported the status of the AD (Annex 6). The week was perturbed by many faults. Alpha and Aegis experiments are very sensitive to beam position oscillations due to ejection septum instabilities. This problem should be fixed during the technical stop. On Wednesday the C02 cavity stopped following the voltage program erratically (investigations are on-going) and the AD target water cooling pump tripped (solved). Both kickers erratically tripped and are only resettable by the specialists.

M. Gourber-Pace asked why the kickers could not be reset remotely. **T. Eriksson** answered it should be discussed with the specialists as they certainly have a good reason to protect the reset.

AD Users

H. Wilkens said that given the machine status, the week was not great. Nevertheless, when available, the beam quality was good.

SPS

K. Cornelis reported the status of the SPS (Annex 7). The operation was smooth until Wednesday, when troubles started. Several hours of the MD were lost due to a cooling problem on the compensator. The fixed target beam, which was supposed to restart at 20:00, came back only at midnight. The problem was a bad reading and control of the TBIU, TBID positions on the targets. The expert had to come in and after diagnosing a network problem, he had to re-initialize everything. On Friday, after the beam returned in the injectors after a stop, the beam would only circulate for about 150 turns with high beam losses in 5.17 and subsequent BLMs. It turned out that during the beam stop a test took place with the prototype wire scanner in 5.17, and all suspicion turned to this. It was decided to open the vacuum chamber, and an obstacle was found in the form of an electrical wire, part of the current loop for the wire presence check. The beam was resumed on Saturday morning at 10:00 without difficulties (21 hours stop). Saturday evening, the TBIU, TBID problem came back. Some hardware in the network was changed, and the system was restarted. There was also a problem with the MKP during Saturday night. In the end interlock levels on the heater were changed. On Sunday evening the partial/total switch on the MBE2103 was out of control. It turned out to be due to a water leak, dripping on the power supply. The problem could be solved in less than 3 hours.

B. Mikulec asked whether the problem with the wire scanner was understood. **A. Guerrero** answered it should be checked with the specialist. **J. Ferreira and D. Mcfarlane** added that the decision to re-install it or not during the technical stop had to be taken today. **H. Vincke** asked about the wire scanner activation level. **J. Ferreira** answered it was measured to be 8 mSv/h. He also added that for vacuum interventions on operational machines, the piquet should be contacted first and not the specialist. **B. Mikulec** confirmed she would contact BI to reach a quick common decision on the re-installation of the prototype wire scanner.

North Area

B. Rae said it was a good week.

North Area Users

H. Wilkens said that the users only took beam for 4.5 days and they were very happy. Next weeks, a shorter target will be installed in T4 for NA62 to increase the intensity.

HiRadMat

B. Rae said that the next users would install the experiment tomorrow. They will be ready to take the beam on Friday. **V. Kain** asked whether the beam request could be clarified, as the requested intensity was outside the allowed range.

AWAKE

There was no report.

LHC

M. Lamont said that the LHC was on regular operation last week. A MD took place over the week-end and the technical stop started on Monday morning.

Linac3

R. Wegner reported the status of the Linac3 (Annex 2). It was a very good week with only 2 short interruptions due to source RF generator (Thomson) trips. D. Kuechler is back since Monday, which is reflected by a steady increase in beam current.

B. Mikulec asked whether it was considered to implement an automatic regulation of the Linac3 source in the future, as it is now the case for the Linac4 source. **JB. Lallement** answered that the question was already raised within the Linac team.

LEIR

S. Jensen reported on the LEIR status (Annex 8). It was a very good week for LEIR with an availability of 99.5%. Only two minor faults due to ER.ECNSC20 magnet and ER.CRF41 cavity trips. BTV tests are on-going to identify damaged screens.

PS

M. Fraser reported the status of the PS (Annex 5). LHCION lifetime measurement are taken at every shift (lifetime around 4 seconds). Since Saturday, some issues were encountered with sudden beam loss in the cycle. They were understood to be due to sensitivity of RF loops to the super-cycle composition (RF expert investigations on-going).

SPS

K. Cornelis reported the status of the SPS. Due to the machine problems and the long week-end, there was not much progress on ion beam setting-up last week.

CTF3

There was no report.

TI

There was no report.

3. Schedule updates

B. Mikulec presented the injector schedule v 2.0 (Annex 9). As planned, the COLDEX run took place on Monday and was quite successful.
For what concerns the technical stop:
High intensity beams (ISOLDE, NTOF, SFTPRO, EAST AREA and AD) will be stopped today at 15:30.
Low intensity beams will be stopped on Wednesday morning at 4:30 and ion beams at 6:30.
The SPS requested to receive the beam as early as possible in order to be able to understand if the soft clamp installation went well.
M. Lamont added the LHC will run next week with very high beta* for the first 4 days. The beam is ready from the SPS. K. Cornelis said that the fixed target physics could start on Thursday evening if the soft clamp installation went well. Else, it will resume on Friday morning.

4. AOB

There were no AOB.

Next Meeting: Tuesday 20th September 2016.

Minutes reported by JB. Lallement on 14st September.

Summary of the 31st FOM Meeting

Held on Tuesday 20th September 2016

Agenda (https://indico.cern.ch/event/569821/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule updates*
4. *LHC MD 4 beam request*
5. *AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.

There were 3 open actions (Annex 1),

1. Concerning the SPS QF glitch there was no news. The action stays open.
2. There was no update concerning the document of procedures for WS settings for the injectors. The action stays open.
3. Concerning the ISOLDE interlock monitoring of the intensity, target type, steering and focusing there was no news. The action stays open.

2. Status of the machines

Linac2

R. Scrivens reported the status of the Linac2 (Annex 2).
During the technical stop on Wednesday-Thursday the source cathode and electrodes were replaced. The intervention went smoothly. The controls system was quickly back operational after its upgrade, so the source formation could be started right away. Currently the source delivers 140mA of beam current. Cathode heating is being slowly increased. It is possible to discuss a further increase of the intensity.
The old cathode had a black coloration strip and some marks. Also the extraction electrode had unusual marks.
Comment from K. Hanke: Over the weekend the intensity was still dropping, so does it mean that this intervention did not solve the problem?

A: Yes, this means that we still have not found the principle reason. But we have gained back the margin on cathode voltage that we can use to compensate the intensity drop.
Q. from B. Mikulec: Do you still plan to optimise all the knobs that you have at your disposal to try improving the situation?
A: Yes, it is usual for a new cathode that it needs to be constantly tuned before it stabilizes.
Q. from K. Hanke: Is it planned to continue like this? What is plan B, as this was not a fully successful fix?
A.: The plan B is to introduce a new source that is being prepared. However, it is very risky to put into operation a brand-new device, as it almost certainly won't work right away. It is planned to be installed and tested just after the end of the run. In case of a catastrophic event we could be forced to install it now anyway.

PSB

J.-F. Comblin presented the status of the PS Booster (Annex 3).
Availability was 95%. Problems with:

- Isolde access system and radiation monitor (40m + 1h8m)
- Beam stopper acquisition issue (1h14m)
- BR3.C02 repair needed an access to change an airflow module (3h9m)
- Electrical glitch (1h24m)
- Kicker BI4.KSW control charge unit (1h52m)
- Not unlocked BTY.BVT101 power supply after the TS (1h10)

There were 2 main interventions during the Technical Stop:

1. Wire Scanners
    a. Ring 2 horizontal was moved to Ring 1 horizontal
    b. Ring 4 vertical and Ring 2 horizontal replaced. The latter one still has issues, namely spikes in the profile and it measures a twice smaller beam emittance than expected.
2. To reduce the synchronization jitter on Ring 1 a shielding was placed on a phase pick-up amplifier, to reduce the perturbation of the magnetic field of the slow bumper that is next to it. This gave very good results. Another shielding for Ring 4 is already available.

The problems encountered during the restart after the technical stop:

- 16h15: INCA piquet called because we could not control the beam stoppers.
- 16h34: RF specialist called for problems with BR3.C02. An access was needed to change an airflow module.
- 17h26: Vacuum piquet called because the BT valves were still closed.
- 17h38: Kicker piquet called. BI4.KSW CCU (control charge unit) has been changed.
- 19h30: Power piquet called for BTY.BVT101 as it was not unlocked.
- 19h35: No beam on Ring 1: LX.TCL-MEAS found enabled, and all other tail clippers disabled.
- 19h45: RF Piquet called for transverse feedback of ring 1. Local OFF/ON.
- 20h40: Beam ready for Isolde & PS.

Q. from B. Mikulec: We try to analyse how the restart went in order to improve the procedures for the future. For the vacuum issue, was the procedure incorrect or was it just an overlook?
A. J. Ferreira: There is a procedure in place. In this case it was a human error.

ISOLDE

E. Matli reported the status of ISOLDE (Annex 4).
GPS availability was 87%. The physics was stopped after the technical stop.
The issues:

- Electrical failure on a Ramses box (1h11m)
- Interlock from ventilation (40m)
- Issues of PSB (5h25)
- HV target heating (2h42)

HIE availability was 61%. It was affected by GPS issues, as the beam is taken from there.
A power supply for the 9 gap cavity XRF.IH9GAP source went out of order on Sunday. The specialist could not repair it and the manufacturer was contacted to send a technician, who is scheduled to come on September 20 (the power supply is still under guaranty).

ISOLDE Users

K. Johnston: In general, very happy users for the first HIE-ISOLDE beam time.
Currently the experiments are on standby. For HIE, the 1st part the week was good with a stable machine and intense beams. The weekend was bad due to the machine and the amplifier problems, but most of the physics programme was already achieved. If the beam is back by the coming weekend the physics program should stay on track.

This week there will be collections of isotopes for medical applications taking place overnight until Friday morning while the repair of HIE-ISOLDE takes place.

PS

H. Damerau reported the status of the PS (Annex 5).
An average week with about 92% of beam availability.
Issues with 10 MHz cavities with interlock relay and water cooling of big tuning group causing 5h downtime. POPS tripped 4 times provoking 2h15 downtime. Investigations are on-going. The power glitch on Saturday morning caused 1h30 beam interruption due to temperature interlock of SMH57.
CPU of DCPSBGEN FEC died, replacement was quick, however POPS fully came back only after 1h. It is not understood why it did not come back immediately.

Timeline of recovery from technical stop:
~15h35: Blind access to close Switchyard
~16h00: Restarting equipment, DSO tests EAST T9
~17h30: PS basically ready for beam

~19h00: Ions accelerated
~20h00: LHCINDIV delivered to SPS, 21h15: LHC25#48b_BCMS, 21h45: TOF, 23h00: AD, 1h20: EAST

No major problems during restart encountered, but several smaller issues:

- Two power converters (PR.XSE and PE.BSW23) needed PIPO intervention
- RF systems: C10-46, C20-92, C40-78 tuning and the cavity gap of C40-78 stuck open, C205 mostly solved by experts on Friday
- Problems with 200 MHz application, while cavities were pulsing fine
- Beam permit for EAST T9 after DSO tests

Would be helpful to have an automatic or a semi-automatic check for equipment that is successfully restarted

- Check equipment as early as possible in case piquet/expert is needed
- No time being lost to diagnose with beam any forgotten equipment

Persons who need to sign the beam permit should be warned in advance so time to gather their signatures is minimised.

East Area

B. Rae: Easy week.

East Area Users

H. Wilkens: The first school team who won the Beamline for Schools competition performed their experiment.
It should be mentioned that the problem with the T11 magnet is still not resolved.

Q **B. Mikulec**: Is it clear if the roof has to be opened to repair the magnet?
A **R. Steerenberg**: There might be hope to repair the fault in situ, to be confirmed tomorrow.

nToF

D. Macina: All fine. Yesterday there was a power perturbation; needed 1h to recover.

AD

L. Bojtar reported on the AD status (Annex 5)**.**
Hard time during the past week. Availability was 80%.
29 hours were lost due to difficulties in finding the reason for losses that were occurring frequently. On Sunday morning access was organised to verify the magnets, as in the past moving coils were found to be the reason for the beam jitter. It was found that on some quadrupoles aluminium foil of the bake-out jackets was touching the coils. Some of these foils bear signs of heating. There is no definitive prove that it was the cause of the issue, however after the intervention the beam jitter occurs much less often, although it is still sometimes observed.

C02 cavity was still tripping quite often, investigations on-going, but the problem is not yet understood. In some cases it was pulsing fine, but there was no voltage on the gap.

Comment C. Rossi: Yesterday it was found that the interlock card on the tuning power converter was faulty and it was replaced.

Comment B. Mikulec to AD team**:** Please arrange a meeting with the vacuum team to consolidate the situation concerning the bake-out equipment. It would be important to at least assess the situation around the entire machine and then propose potential improvements to prevent equipment touching the magnet coils.

AD Users

H. Wilkens: Nothing special to signal. A meeting with the user community will take place to discuss if the plans to connect ELENA still this run should be pursued or not.

SPS

V. Kain reported the status of the SPS (Annex 6).
Availability was 92%.
200 soft clamps were installed around horizontal pickups in order to electrically bypass the insulating flanges around the BPMs, and hence reduce the impedance. Reference measurements were taken just before the TS. After the TS there were no important differences in beam properties observed.

Recovery from the TS took 3 hours. The patrol alone took 2h40min. Afterwards there were problems in restarting the mains and the MKD kicker.

Smooth running of NA physics from Thursday night until Monday. Since yesterday AWAKE commissioning and HiRadMat run.

Electrical glitch on Saturday took 1h of beam time.

Comment D. Mcfarlane: Many doors were accidently un-armed because the mode of operation is opposite in the LHC and in the SPS what leads to confusion, even though there is a sign on each door. In one case the button needs to be pushed, while in the other case it must not. The situation will change with the new access system.
Comment B. Mikulec: Could you please bring this up in the coordination meetings and remind again the intervening teams? This causes a significant amount of time lost during each technical stop.

North Area and HiRadMat

B. Rae: There was some equipment not locked in again after the TS. Yesterday some issue with BI.

Comment by B. Mikulec: There was some miscommunication concerning the HiRadMat beam request. Originally only a 'standard' LHCINDIV beam was asked for, but on Monday the Van der Meer-type beam was requested with 4 bunches. As for this beam in the past only one bunch was used, the PSB operator hat to urgently set up the other 3 PSB rings.
A. by V. Kain: This was an on the fly decision. One has to keep in mind that the HiRadMad experiments are always one-off experiments and very special every single one. Flexibility is required. The preparation of the 4 four bunch van der Meer was very quick with very good quality.

Comment B. Mikulec: This is fine if it is understood that it might delay the delivery of the beams to HiRadMat.

Q. from L. Soby: What was the issue with the beam instrumentation?
A. by V.Kain: It seem to be a synchronization problem with the BTVs.
Comment by A. Guerrero Ollacarizqueta: To me it doesn't look like a synchronization issue.

North Area Users

H. Wilkens: Happy users.

AWAKE

J. Carter reported for AWAKE.
First beam from SPS yesterday evening. There is an issue with synchronization that is being followed up.

Q. from M. Gourber-Pace: How long will the AWAKE run take?
A. J. Carter: 2 weeks.

LHC

M. Lamont reported for the LHC.
Rocky weekend with cryogenics issues. Now very high beta run during 4 days.

Linac3

R. Scrivens reported for Linac3.
During the technical stop the source oven was refilled. The new transformer ITH.BCT41 was installed, which has much better resistance to coupling of adjacent magnets.
The beam restarted rather smoothly on Thursday afternoon.
The Saturday morning electrical perturbation caused 1h stop of the source. Also the RF could not be restarted remotely and needed the PSB operator to restart it locally.

During the following 3 days a new frequency generator configuration will be tested. It has the drawback that inverting to the previous one would need extra time.

LEIR

S. Pasinelli reported the LEIR status (Annex 7)
It was a calm week. During the TS the polarity checks of sextupoles and octupoles were done. A special probe was manufactured to allow inserting it into the magnet apertures that were very difficult to access. All the polarities were found OK.
Regular trips on electron cooler solenoid ER.ECNSC20 and the cavity ER.CRF41.
There will be a Linac3 MD, so no ion beams from September 19 to 23.

PS Ions

H. Damerau:
A hardware modification was made to reduce the jitter of the trigger to the tomoscope. It improved the measurement of the bunch length. This then helped to adjust properly the ion beams and reduce the longitudinal blow-up during the cycle. Asking for feedback from the SPS and the LHC if it brought any visible improvement.

SPS Ions

V. Kain: There was not much time for ions during the past week.

CTF3

P.Skowronski reported for CTF3 (Annex 8).
It was a good week without major technical issues. Beam was delivered to the Two Beam Module for the test of a new beam-based alignment technique. Additionally, the optimization of the recombination in the Combiner Ring was performed. During the weekend there was the Dog-Leg run.
The Control System upgrades passed smoothly and there was basically no beam time lost.
Today morning there is an access in the DL/CR zone to change a MTV camera in the TL2 line.

Q. from B. Mikulec: Concerning the broken 1.5 GHz source, is there any update?
A.: Yes, the previous week the faulty component of the TWT amplifier was sent to the manufacturer. We received information that the issue was identified, it should be repaired and back at CERN during this week.

TI

No report.

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule.

There will be HiRadMat and AWAKE runs during the following 2 weeks.

V. Kain confirmed that there will be a dedicated MD in the SPS on Wednesday.

4. LHC MD 4 beam request

B. Mikulec presented the list of requested beams provided by **G. Papotti**. Most of them are standard beams with the exception of 2 special ones:

- High brightness individual bunch with 2e11p intensity and 1 um transverse emittances
- Standard 1.1e11 ppb 25 ns with 8b4e structure

Comment from R. Steerenberg: Can the PSB produce such a small transverse emittance beam at this intensity? Maybe scraping in the SPS will be required.

5. AOB

1. D. Chapuis asked to perform an access door maintenance of the East Area Access Point YEA01.EA1=157 from Wednesday 21st 8:30 until Friday 5:00.
   Comment from R. Steerenberg: On Wednesday morning there is access planned into the East Area to intervene on the faulty magnet.
   D. Chapuis agreed that the maintenance can start after the access is finished.
   Approved period Wednesday 21st 14:00 until Friday 17:00.
2. There is an IMPACT pending FOM authorization concerning the leap second to be added on January 1. There was no objection to this intervention.

Next Meeting is on September 27.

Minutes reported by P.K. Skowronski on September 22.

Summary of the 32nd FOM Meeting

Held on Tuesday 27th Sep 2016

Agenda (https://indico.cern.ch/event/571494)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule updates*
4. *AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.

There was 1 open action plus 2 postponed (Annex 1):

- Concerning the SPS QF glitch, during the last IEFC the status was presented. **C. Mugnier** explained that the measurements gave a first estimation of the location. They are currently trying to narrow down geographically the fault, therefore it is planned to add probes. The work needs to be scheduled, and a first proposal is to perform it in parallel with the PS pole face winding measurements during week 42. **V. Kain** will follow up the scheduling. The action stays open.

2. Status of the machines

Linac2

R. Scrivens reported the status of Linac2 (Annex 2).
No problems. One 40 minute downtime due to the intervention on the RF of tank 3. It was foreseen to change the amplifier tube, but it was enough to regulate the coupling loop. On 19/09 the source arc current setting was increased to compensate for the decay in delivered intensity. Since then the delivered intensity was even growing slightly.

PSB

B. Mikulec presented the status of the PS Booster (Annex 3).
Machine stops were due to:

- Transverse FB was not fully working for ring 1 and was fixed by regulation
- Problem with the recombination septum BT4.SMV10; the specialist had to access and adjusted the water flow threshold, which is now the same as for BT1.SMV10
- C16 cavity; the specialist needed to replace a fuse of the grid power supply
- Trip of quads because whole rack was down
- Timing issues: rolling buffer was not updated, which led to a beam stop 3 times during the past week; the specialist had to reboot the server
- Beam not injected because of wrong injection/angle position; the makerule is supposed to be correct, but the link between the virtual and actual devices seemed broken. **B. Mikulec** asked CO if some additional diagnostics could be implemented.
- Ring 2 H scanner, showed large spikes in the profile since the exchange during the last Technical Stop; changing the ring 1+2 electronics card with the one from rings 3+4 fixed it. Its calibration was also wrong. BI understood why; using since then the old 2014 calibration, which gives reasonable results; this will be followed up in the emittance working group tomorrow.

Orbit correction campaign with all 6 correctors/ring/plane progressing, with the aim to provide an updated correction for all operational users before the end of the year. The high-brightness LHCINDIV-type beam was prepared for the LHC MD (2E11 p on ring 3 with transverse emittances <1 mm mrad).

ISOLDE

M.L. Benito reported the status of ISOLDE (Annex 4).
The issue with the amplifier for the 9 gap cavity XRF.IH9GAP was diagnosed to be related to an anode problem (still under warranty). The manufacturer sent a technician on the 20th who could fix it.
After restarting on Thursday, the 7GAP1 and 7GAP2 cavities developed issues with their tuners. Experts had to access to fix them.
On Friday the control of the RFQ was lost due to a PLC crash. This could not be followed up immediately because no expert was available. The following day all PLCs controlling the power supplies stopped working.
On Monday a faulty Profi-bus connection was found that most probably was introduced during control modifications to put back into operation the old amplifier for the 9 gap cavity. Afterwards an access was needed to fix the IHS cavity tuner that got stuck.

ISOLDE Users

K. Johnston: As HIE was on hold due to the various machine problems, users were working with medical isotopes and the veto beam line, so it was not an entirely lost week.

PS

A. Guerrero Ollacarizqueta reported the status of the PS (Annex 5).
Stable week.
On Tuesday 5 beam stoppers (AD and nTOF) went into the beam due to a PLC issue.
Stopper DI.STP6069 is not belonging to the security chain and is not a part of the PS control system anymore, for which reason the beam was not interrupted immediately what provoked a radiation alarm in the AD injection.
On Wednesday works on the access system in T11 provoked the trip of the SMH57 kicker producing some disturbances for the EAST beam. Also several disturbances to the beams extracted to TT2 due to a programming of a cycle without destination that tripped KFA71.
Two issues in KFA4 on Thursday (HV interlock and failure of mechanical switches in a thyratron) what interrupted the MTE beam for 2h.
During the weekend instabilities in ZT9.BVT01 pulsing and ZT10.QDE05 (couldn't be reset) that was fixed by First Line. Also an issue of one KFA71 kicker module had to be fixed by a specialist.
The LHC MD beams LHC25#56b_8b4e, LHC25#80b and LHCINDIV high brightness (horizontal and vertical emittance of 0.9um and 1.1um, respectively) were prepared.
Q. from B. Mikulec: Could one prevent to send a cycle without destination?
A: The issue was that it was programmed on stand-alone and without the simulated RF frequency.
D. Cotte agreed to follow this up with **J-C. Bau**.
Q. from H. Vincke: Since we had a radiation alarm due to the fact that a beam stopper was not in place - shouldn't the stopper be part of the safety system?
A: To be followed up and eventually modified during the next technical stop.

East Area

B. Rae: Good week. There was a T11 intervention due to a water leak of a magnet. The magnet exchange is scheduled for the EYETS. Access Point interventions need to be scheduled.
Comment from B. Mikulec: This point will be discussed as AOB later in this meeting.

East Area Users

H. Wilkens: The beam was served for the winner experiments of the Beamline for Schools competition and for irradiation tests conducted by RP. Happy users.

nToF

D. Macina: Smooth running. RP changed one monitor. During the coming days nToF will be running with low intensity.

AD

L. Joergensen reported on the AD status (Annex 5).

The machine is back in good form. There was virtually no downtime.
On Friday 1/4 of stochastic cooler amplifiers tripped and the remote restart did not work.
On Monday the electron cooler solenoid went into a strange state, already for the 5th time.
Also on Monday we observed strange losses occurring every 3rd shot, later their frequency decreased to finally disappear by itself; the reason was not understood. The cycle looked good on Schottky monitors, but only 0.3E7 was ejected and practically no beam in the ring just prior to ejection. The septum and kickers appeared to behave normally.
ALPHA reported that the beam moves in the horizontal plane for around +/-3 mm. One of the suspects is the septum magnet.
Q. from M. Gourber-Pace: Who is responsible for the control of the solenoid power converter?
A. by T. Eriksson: C. Oliveira. This issue shows up every 3-4 weeks.
Comment by T. Eriksson: The septum was checked by ABT; cabling and waveform are OK.
Comment by M. Hourican: Yes, all was checked fine.
Comment by T. Eriksson: ALPHA is the only one that complains about the beam movements.
Q. from L. Joergensen: Was there anything special done in the PS yesterday around 8:45? AD observed some big improvement in the efficiency.
A.: No, nothing special.

AD Users

H. Wilkens: ASACUSA was running pbar-helium spectroscopy.

SPS

V. Kain reported the status of the SPS (Annex 6).
An average week for the SPS, with 90% beam availability for fixed target physics.
1h problem with controls at UA9 due to SIS that lost subscription. It was understood and fixed yesterday.
HiRadMad CableStack run successfully finished. The beam size was not correct; not certain if this is due to an optics issue or instrumentation. To be understood.
It was the first week of beam for AWAKE. Delivered 3e11 protons. First alignment with LASER was done and synchronization started.
The high brightness with 1 um emittances INDIV beam was prepared in the CPS, but not yet in the SPS. It was taken, but emittances blew up by a factor 1.5.

Q. from M. Gourber-Pace: This morning there was something new in the logbook about an UA9 control issue. Is it still the same problem?
A V. Kain: I have not seen it; I will check. This issue was already observed in the past.

North Area

B. Rae: Good week.

North Area Users

H. Wilkens: Happy users. COMPASS has hydrogen target problems that were fixed by additional pumping.

HiRadMat

No report.

AWAKE

No report.

LHC

No report.

Linac3

R. Scrivens: Past Monday another TWT was installed. Beam commissioning was continued until Thursday. Achieved 10% improvement in the intensity.

Q. from H. Bartosik: The TWTA installation in the Linac3 source will thus stay?
A R. Scrivens: Yes, we should keep it running to allow further studies on the performance in LEIR. For the moment an intensity gain in LEIR could not be observed.

LEIR

S. Jensen reported the status of LEIR (Annex 7).
The beam was back after TWT installation and commissioning in Linac3, which was very good and stable. On Sunday ER.CRF41 developed a fault, which could not be reset and was fixed on Monday morning.
Inspection of ER.BTV12 showed that it needs to be exchanged, which will be done during the EYETS.
Beam activities:

- Friday: LN3 TWTA tests, beam to SPS for RF optimization, LEIR LLRF studies
- Beam to PS for lifetime studies (EARLY)
- Monday: RF development
- Tuesday: LN3 TWTA tests

PS Ions

A. Guerrero Ollacarizqueta: The lifetime of the EARLY beam was measured to be 3.5 – 4 seconds.

SPS Ions

V. Kain: The ion beam was taken on the MD cycle. It was good in the longitudinal plane. During this week work will continue on the LHC cycle.

CTF3

P. Skowronski:
Good week. Beam was delivered to the Two Beam Module for Wake Field Monitor studies and RF conditioning over nights. Studies on beam recombination in the Combiner Ring continued. MKS05 started developing an instability in the RF power; fixed by exchanging a thyratron on Monday morning.
The component of the broken TWT was fixed by the manufacturer and is on its way back to CERN.

TI

R. Ledru: Quiet week.

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule.
In the LHC there will be MDs for the whole of next week. Still some final adjustments are needed in the SPS for the requested beams.
Q from B. Mikulec: Are there any dedicated MDs scheduled for this week?
A. by H. Bartosik: Yes, in the SPS; the LHC ion beams and beam for AWAKE.

Afterwards the 2017 draft schedule was outlined, as it was presented in the last IEFC by **R. Steerenberg**. It was approved by IEFC and will be shown for research board approval tomorrow.

In the beginning of next year in week 1 and 2 there will be controls system interventions during which no machine can be running. The LHC will start as of May 1st. There are 2 Technical Stops foreseen in weeks 32 and 44.

Comment from D. McFarlane: Planning the only Technical Stop of 36 hours for the whole year in the month of August will not work. Not only are the vast majority of people from CERN on vacation during the months of July and August, but also if any outside companies are needed for anything, I think most companies in Europe close for 4 weeks in August so they would not be available.

Comment from D. McFarlane: The SPS will now be closing on Friday the 24th March and not the 31st March as originally planned. This is due to a request from EPC for more hardware testing time for their equipment with the machine closed.

The first (8h) Technical Stop is only for the injectors; no LHC stop.

Comment by R. Scrivens: I already asked M. Lamont to extend this stop because there will be the installation of Linac3 to LEIR BPMs, which are in the PS tunnel and need breaking the vacuum.

Comment by M. Gourber-Pace: The LHC will already be in the commissioning stage during the first injector TS, so it may be affected.
A: It needs to be arranged that a long fill is kept for the whole injector stop time.
Comment **E. Bravin**: During commissioning usually only injections or short fills are made.
A. **B. Mikulec**: An arrangement needs to be defined beforehand.

Comment from D. McFarlane: Only 2 Technical Stops during the whole year is not enough in my opinion. Originally we had 4, which was reduced to 3 this year. Also, if there is any need to break the vacuum then a minimum of 24 hours is needed. It is not really possible to do anything in an 8 hour stop.

Comment from K. Cornelis: HiRadMat asks for high intensity beam already on the very beginning of the run. As the machine may be not yet be scrubbed and new hardware is going to be installed, it is very likely that that this won't be possible.

There is another TS for the LHC only towards the end of the year. Could this not be combined with an additional injector TS?

Comment from K. Cornelis: SPS needs in average 3-4 interventions on the vacuum over the year; we need more long technical stops.

B. Mikulec said that she would transfer these comments still before the Research Board to M. Lamont and R. Steerenberg.

4. AOB

- CTF3 access door YEA01.CLX=2010 maintenance from Thu 29 to Fri 30 September. IMPACT No: 84289. **Approved.**

- Start of service of new East Area Access Point T11 CLOUD-Tests and DSO tests of primary zone T11 CLOUD requiring:
  a) 4 hour slot for T11 zone functionality tests after the change (new security doors, Search Box, Patrol Box). Attention: perturbations for EA1 primary zone.
  b) 1 ½ hour slot for DSO tests. Attention, perturbations of EA1 primary zone.
  Comments J. Spanggaard: I believe it was not discussed yet and scheduled with the Safety Unit.
  Comment from H. Wilkens: Could it be done tomorrow morning, as there will be a user switch?
  Approved:
  ad. a) Wednesday September 28 from 9h to 13h.

ad. b) Friday September 30 from 9h to 10h30.
Monday morning start of T11 for physics.

- Tuesday September 27 at 18:00 for about 2 hours, there will be a general upgrade and reboot of all Linux Virtual machines and development servers. It affects only the development environment.

Next Meeting: 4th of October.

Minutes reported by P.K. Skowronski on 30th of September.

Summary of the 33rd FOM Meeting

Held on Tuesday 4th October 2016

Agenda (https://indico.cern.ch/event/574021/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *Update on the 2017 draft injector schedule*
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 32nd FOM are approved.

There were three open actions (Annex 1).

1. The SPS QF ripple was discussed later in Schedule Update. The action stays open.
2. An update on the procedure for the WS settings will be given in the coming weeks. The action stays open.
3. Concerning the ISOLDE interlocks system update, **L. Fadakis** said that a solution will be presented at the FOM in a couple of weeks. The action stays open.

2. Status of the machines

Linac2

R. Scrivens reported the status of the Linac2 (Annex 2). It was a very good week with only 3 minutes downtime. He added that the intensity from the source slowly increased until Saturday when ISOLDE stopped taking the beam.

PSB

E. Benedetto presented the status of the PS Booster (Annex 3). It was a very good week with only 3 hours beam stop due to a fault on the BT1.SMV10 septum (2 hours for cool down and 1 for access). The final orbit correction campaign continued with an improvement from 2 mm to less than 1.5 mm (even 1 mm) rms orbit excursion when adding the 2 extra correctors per plane per ring.

K. Johnston commented that the beam intensity requirements might be discussed with the PSB operation when starting the beam on GPS.

ISOLDE

L. Fadakis reported the status of ISOLDE (Annex 4). Last week was fully dedicated to HRS. There were few issues related to the target developing a leak. The target finally failed on Saturday midnight, just 7 hours before the scheduled experiment end. Nevertheless, it was a quite successful week.

ISOLDE Users

K. Johnston said that users were very happy with the long run with 142Xe at 4.5 MeV/u. It was the first demonstration of the very high potential of HIE ISOLDE. A particular highlight was the observation of an 8+ state. A lot of new data were produced and the users are very satisfied. For this week, it will be 80Zn on the GPS. As this is a challenging beam, the optics of the machine need to be re-examined before the physics can start. In addition, the run will last almost two weeks, so the use of STAGISO beam is being explored to prolong the life of the target and ion source.

PS

M. Fraser reported the status of the PS (Annex 5). It was an excellent week with 97% availability. Few minor faults caused a few minutes of downtime including resettable POPS trips and a quick stop for an intervention on the RF. Because of a cooling water fault related to the pressure, the TDI48 was removed from operation and replaced by the TDI47. The beam was lost yesterday when switching from fixed frequency to measured beam revolution frequency after injection (recurrent event, but not frequent; it last happened in July). Instructions are left in the logbook for the OP team in order to help the RF specialist to identify the source of the issue next time it occurs. The DSO test took place for the EAST area on Friday and the beam permit was signed during the week-end. POPS specialists are requesting a 2 hour beam stop for an intervention before the end of the week.

B. Mikulec said that the scheduling of the POPS intervention will be discussed later in Schedule update.

East Area

B. Rae said it was a very good week. The DSO test for T11/CLOUD was passed last Friday. The T11 beam will be switched on for the first CLOUD run this year today or tomorrow. CLOUD will requests 3 EAST_NORTH spills.

East Area Users

H. Wilkens confirmed the CLOUD experiment was starting. This year, CLOUD will study the role in cloud formation of organic compounds from anthropogenic origin. Last year they studied the role of organic compounds from biogenic sources.

nToF Users

D. Macina said it was a good week. The last experiment change will take place next week for 3 days in EAR2. As usual, beam during nights and accesses during working hours.

AD

B. Dupuy reported the status of the AD (Annex 6). It was a very good week with 95% availability. On Monday the beam was unstable for 5 hours. The C02 did not trip, but no voltage was visible. This is now a recurrent problem, but very random. After a lot of hardware changes (tuning board, HF relays), the RF the specialists found the source of the issue (it was a bad wire connection).

AD Users

H. Wilkens said that there was nothing special to report.

SPS

K. Cornelis reported the status of the SPS (Annex 7). It was a pretty good week with more than 90% availability. The main downtime occurred on Thursday, when the beam was stopped for 11 hours due to a water leak on the MSE power convertor. Most of the intervention time was due to the fact that a complex bus bar had to be dismounted in order to reach the leak under the false floor. On Wednesday, they had to scrape the beam to limit the losses in the TI2 transfer line. The AWAKE laser-beam alignment and synchronization are completed.

S. Deleval commented that even if the leak was repaired on the MSE convertor, there is still an important water consumption in BA2. Investigations are ongoing to find another very probable leak. An update will be given at the FOM next week.

North Area

B. Rae reported on the North Area. On Wednesday evening, after the MD, a problem occurred with mode changes in several access zones in EHN1. It was due to a communications problem, which was solved by the access piquet. On Friday a short muon run in K12/NA62 required minor short interventions from SPS operators.

North Area Users

H. Wilkens said that the NA61 and NA62 experiments reported very good beam intensity stability in terms of 30-50Hz ripple over the last week. They also expressed their thanks to the SPS operators for their prompt action when they signaled the fluctuations were out of specs.

HiRadMat

B. Rae said that there was nothing special to report.

AWAKE

There was no report.

LHC

There was no report.

Linac3

R. Scrivens reported the status of the Linac3 (Annex 8). The linac availability was 100% over the last week. The TWTA brought some 10 to 20% extra intensity from the linac. The source required lots of expert tuning. The oven refill took place yesterday.

D. Kuchler said that they were having some problems to get the source back. He also added that operators switched the source back on, on Sunday, without checking the Linac3 logbook, where it was marked that the source was switched off on purpose (to prepare for the oven refill). They will follow up to assure a good communication flow.

LEIR

M-E. Angoletta reported on the LEIR status (Annex 9). Ions were delivered to the SPS for setting up (NOMINAL beam) on Wednesday. On Thursday, the users were moved to the hot spare CRF43 cavity, as the CRF41 cavity was often tripping. On Friday, beams were moved back to the CRF41, as the intensity was too low with the CRF43 (4e10). MDs with the CRF43 will start this week for optimization. The RF specialists intervened on the CRF41 yesterday and found a bad contact on a 5 V power supply that they replaced. That solved the issue.

R. Scrivens reminded that operation with the two cavities would be required for LIU.

PS

M. Fraser reported the status of the PS (Annex 5). Ions lifetime measurements were found to be dependent on the super cycle composition and beam intensity (measured around 5 sec last week). Work on YASP is ongoing. The injection septum does not follow the set value. Investigations are still ongoing.

SPS

K. Cornelis reported the status of the SPS (Annex 7). They are progressing with the nominal LHC filling cycle.

CTF3

After the meeting, **F. Tecker** sent the following report:

CTF3 had a week without major issues. Beam time was divided between the beam-loading experiment and studies of the drive-beam recombination. Occasional radiation alarms from CTF2 result from RF breakdowns in the wave guides passing there. The issue is being followed up with RP. Beam time in CALIFES was mainly used for a CLIC prototype cavity BPM study. The broken TWT got repaired on Friday.

TI

R. Ledru reported that the NA62 Gigatracker cooling circuit tripped on Saturday and that the heating plant was restarted yesterday.

3. Schedule updates

B. Mikulec presented the injector schedule v 2.1 (Annex 9). LHC MD is ongoing.
Two interventions are requested during the week 42:

- The installation of probes for the SPS ripple issue. **C. Mugnier** said that it should not take more than 4 hours (4 hours in the SPS). To be confirmed with the magnet team (**J. Bauche**).
- PS pole face winding tests (4 hours in the PS).

These two interventions have to be coordinated and scheduled depending on the cool-down, the UA9 run and the injector MD. The PS, SPS and UA9 teams should come back next week with a new week 42 schedule proposal.
S. Montesano (UA9) added that they had a problem with a fast BCT in BA3. That problem should be fixed before the UA9 run. **L. Soby** said that the problem could be fixed in less than 2 hours.
It was therefore decided to have the intervention on the fast BCT in BA3 in parallel to the POPS intervention (that also requires 2 hours) sometime on Friday morning (to be precisely scheduled depending on the LHC MD).

***After the meeting**: The POPS DC6 cooling circuit pump motor failed on Wednesday morning. The motor was replaced and the POPS intervention is therefore not needed anymore on Friday. The fast BCT intervention will therefore not take place on Friday, and a solution should be found for the FBCT calibration before the UA9 run.*

D. Manglunki said that it was initially scheduled not to send any ion beam to the LHC before the 14/11, while first ion beam to the LHC was now advanced to the 20/10. The SPS has therefore to anticipate the ion beam setting-up. Two 16 hour shifts will take place on the 20/10 and another day of setting-up is needed tomorrow. The NA and EA will be affected by the super cycle modifications. **H. Wilkens** confirmed that Wednesday was the best day not to disturb too much the users.

4. Next year schedule

M. Lamont modified the 2017 injector draft schedule (Annex 10). The comments received from the FOM were taken into account: First 24 hour injector technical stop in week 22 (still tbc). The second technical stop (36 hours) was moved from the holiday period to September (week 37). A third technical stop will take place in November in parallel with a LHC TS. The present version is still a draft and has not been approved yet (pending the approval of the LHC schedule).

5. AOB

The maintenance of the YEA01.PSR=152 access door from 5/10 08.30 to 7/10 12.00 was approved.

Next Meeting: Tuesday 11th October 2016.

Minutes reported by JB. Lallement on 6th October.

Summary of the 34th FOM Meeting

Held on Tuesday 11th October 2016

Agenda (https://indico.cern.ch/event/575502/)

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 33rd FOM are approved.

There was no update on the three open actions (Annex 1).

2. Status of the machines

Linac2

R. Wegner reported the status of the Linac2 (Annex 2).

Over the weekend, the number of missing pulses from the source steadily increased until the Hydrogen flow was increased on Sunday morning. The intensity to the PSB was typically between 135 and 140 mA.

B. Mikulec asked that the next week's supervisor give an update on the source status at the next FOM.

PSB

J.-L. Sanchez Alvarez presented the status of the PS Booster (Annex 3).

It was a good week for the booster. On Tuesday the ISOLDE proton scan was delayed by 2 hours (robot KUKA sending bad condition to the security chain). On Wednesday, RF specialists changed a NIM power supply of the cavity C04 ring 3 (1 hour downtime). The intervention on BE3.DVT11L1 (4 hour downtime) had no impact, as it was in the shadow of the POPS intervention. During the weekend, as already mentioned, the booster suffered from missing Linac2 pulses. The new orbit has been propagated (6 correctors) to all operational beams except for ISOLDE.

ISOLDE

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

All last week was spent preparing for the third HIE-ISOLDE experiment of the year (^{78}Zn beam at 4.3 MeV/u). The experiment just started yesterday evening. It was delayed by two days due to several issues: A vacuum leak in the laser window of the GPS separator, which was replaced yesterday; a problem of synchronization between the REX-TRAP Penning and the REX-EBIS charge breeder (not yet understood, CO request in preparation to improve the diagnostics of this issue).

B. Mikulec asked why it took so long to replace the vacuum window. **A. Rodriguez** answered that, mainly due to the location of the intervention (separator highly activated) and the need of specialists from the laser team, the intervention turned out to be very difficult to organize for Friday afternoon. It was therefore decided to have it done on Monday. They could have run with less power from the laser during the weekend, but they would have had 3 times less intensity (not very useful for the users) and would have activated the area.

ISOLDE Users

There was no report.

PS

R. Steerenberg reported the status of the PS (Annex 5).

The PS had a good week with an average beam availability of 92%. The main faults causing downtime were POPS with over 9 hours without beam and two smaller issues with the RF systems causing a cumulative downtime of 2 hours. The issue with POPS was due to a broken motor of a water-cooling pump. Last week the pump started making more noise and a 2 hour intervention was scheduled for Friday 07/10. Unfortunately, the motor broke during the night of Tuesday to Wednesday, just after midnight. The diagnostics required nevertheless quite some time and the EPC-piquet decided not to call the POPS specialists for a motor exchange during the night. The acting PS machine supervisor nevertheless called the specialist who confirmed that the repair would have to wait until the morning. During the morning the motor was exchanged within 2 hours and the beams were back around 09:00. On the RF side the main issue was a breakdown of one of the 10 MHz cavities (straight section 91) that required access in the PS, hence cool-down etc... The total downtime was 1 hour and 50 minutes. On the positive side the ions were delivered successfully to the SPS for setting up. The CLOUD experiment in T11 also resumed beam operation after the DSO test and release of the East Area T11 (secondary beam line) beam permit that was interrupted for some upgrades in the zone. During the week all required MD beams for the LHC MD week were delivered with the required characteristics. The nToF delivered intensity is 2% above the one scheduled at the moment.

C. Mugnier commented on the POPS intervention. The piquet was not able to restart in degraded mode (without the faulty module), as POPS was already running in degraded mode. Therefore, it became an issue to be sorted out by the specialists. This is why it was decided to wait for Wednesday morning to start the intervention.

East Area

L. Gatignon said that CLOUD started its run successfully on Wednesday evening. They will ask for 3 East-North cycles when they have a beam request.

East Area Users

H. Wilkens confirmed that the users were happy.

nToF Users

D. Macina said that the data taking went very smoothly until the end of last week. Since Monday, a new experiment and collimator are being installed in EAR2 (during working hours). Last night they had an RP alarm and they were asked not to take the beam for the night. The analysis of the measurements taken by RP will be presented this morning and should confirm that they can restart having beam during nights.

AD

S. Pasinelli reported the status of the AD for **B. Lefort** (Annex 6).

It was a good week with an availability of 88%. The C02 cavity is still dropping out from time to time due to an intermittent unresolved problem that needs further investigations. The E-Cooler failures are suspected to create orbit jumps (when E-Cooler solenoid power supply trips, nearby correctors are magnetised in a way that the orbit is modified). The commissioning of the new orbit measurement system is progressing well. Preliminary results are very good and it could be deployed at AD really soon. The MD was cancelled and the interventions were reported to the next MD (every 3 weeks).

B. Mikulec remarked that the problem with the C02 cavity is now present since several weeks. **S. Pasinelli** answered that RF experts think it is due to a bad contact, but it is not easy to diagnose.

AD Users

H. Wilkens said there was nothing special to report for the users.

SPS

V. Kain reported the status of the SPS (Annex 7).

It was not a very good week for the SPS. The week was devoted to the LHC MD week and hence difficult for the North Area concerning availability and beam quality. Some of the downtime could possibly have been avoided if discussed before (examples: users wanting to use the goliath magnet, but cooling circuit out of service and tripping all cooling of BA81, LHC request for BSRT calibration with screens in TT10 causing 2 hours with no beam for fixed target!). Saturday late evening all of a sudden all types of beams were lost on the first turn with very small beam loss in location 224. Eventually it was found that one of the vertical bumper magnets, the one in 223, was not following the reference anymore (instead of zero current at flat bottom it had an offset of 15 A). All together with the

piquet intervention this incident meant 6.5 hours of downtime. High intensity BCMS (1.3e11 ppb) for the high pile-up run is required on Friday. The location of the leak of demineralised water in BA2 has still not been identified yet. The FBCT intervention required for the UA9 run could not take place this week.

S. Montesano said that BI did a recalibration of the FBCT. The data taken so far showed the calibration issue seems to be solved. **L. Soby** said that due to a poor quality cable, the accuracy could be degraded.

H. Vincke asked about the quantity of water lost in the tunnel (at BA2). **V. Kain** said that the water is apparently not lost in the tunnel. **B. Mikulec** will ask for an update from CV.

D. Manglunki said that the compatibility of the high intensity BCMS beam with the dump status should be checked with EN/STI. He will follow this up. He also added that the magnet interlock is bypassed for the ion beams. EPC should be contacted to set it properly for the DSO tests (as soon as possible).

North Area

L. Gatignon reported few problems on the North Area. On Tuesday evening the BA81 water station tripped due to an unforeseen switch-on of the Goliath magnet. All BA81 converters were stopped for about 2.5 hours. On Wednesday a coil temperature interlock occurred on MSN.043.029 in the P42, causing a 3-hour stop for the beam to NA62 during the LHC ion cycle commissioning. It was finally traced back to the presence of spurious timing events in the LHC ion cycle, causing the magnets to ramp up and be at high current for a too large fraction of the time. This is potentially dangerous for this delicate type of septum magnets, which are located just downstream of the TAXes in TCC2 and for which very few spares are available. They also overheat when no timing events are present and the magnets are effectively DC powered. Therefore it was agreed that a check will be added in the SIS that exactly one user in the super-cycle has such timing events. Also NA62 complained about the spill quality (30 Hz and spikes at the beginning) during this ion cycle commissioning that prevented them from taking data for many hours. On Monday QUAD.021.470 in the H2 beam failed reaching nominal current only from time to time or for part of the flat top. This is a very unusual fault, which was solved quickly by the first line team, but the localization of the fault took several hours.

North Area Users

H. Wilkens said, as already mentioned, that the week was not so good for the users. NA61 also turned down their magnet when the problem with the cooling water occurred. NA62 complained about the beam quality when changing the supercycle composition.

HiRadMat

There was no report.

AWAKE

There was no report.

LHC

M. Lamont reported on the LHC status. The MD week was successful. Regular operation resumed over the weekend and physics restarted on Sunday.

Linac3

R. Wegner reported the status of the Linac3 (Annex 2).

Linac3 is running pretty well. The ovens were refilled last Monday. After a difficult source restart, 30 uA were delivered on Wednesday morning. Since then Linac3 was running impressively stable. A reset of the RFQ amplifier was needed on Thursday. Oven heating were already pretty high and the next oven refill might be anticipated.

LEIR

D. Manglunki reported on the LEIR status (Annex 8).

It was a short, but busy week for LEIR. In addition to the operational EARLY and NOMINAL beams delivered to the PS, MDs took place on AMD (100 ms injection rep rate), ANOMINAL (resonance compensation), and AMDRF (space charge mitigation by bunch flattening). After the source refill on Monday, only a weak beam was available for LEIR on Tuesday in the evening. On Wednesday morning, the Linac3 beam was back to specs and the NOMINAL beam started to be delivered to the PS for SPS beam commissioning in view of the LHC p-Pb run. At 10:40 all power supplies of the electron cooler as well as the transverse damper tripped, with no apparent reason. Everything could be reset and turned back on remotely without problem, but the transverse damper fault was not displayed on the Laser alarms; this is being followed up. On Friday afternoon the CPU card was changed on the power supply of the operational RF cavity (ER.CRF41). Various equipment trips (RF cavity ER.CRF41, injection bumpers ER.DFH) on Sunday could be reset remotely. The NOMINAL beam has been kept running during the whole weekend, well inside LIU specs (>7.5e8ions/bunch extracted towards the PS).

PS (ions)

R. Steerenberg reported the status of the PS with ions. They noticed that the brightness of the ion beam was considerably increased as they observed first longitudinal blow up and satellite beam generation. This means a very good quality of the beam from LEIR.

SPS (ions)

V. Kain reported the status of the SPS with ions (Annex 7).

On Wednesday progress could be made on the nominal LHC ion cycle with 7 injections, but the beam was not extracted yet. For the setting up, some beam time was taken from the NA physics and the users were acknowledged for their understanding.

CTF3

There was no report

TI

J. Nielsen reported that the COMPASS experiment had a problem with a spectrometer on Tuesday. In the TIOC it was clarified that the Goliath circuit is not needed for COMPASS, COMPASS is directly supplied from BA82. Concerning the water leak in BA2, a problem was found with an electro-valve used for sampling the demineralized water. The problem was fixed and reduced the leak, but its main cause was not found yet.

3. Schedule updates

B. Mikulec presented the injector schedule v 2.1 (Annex 9). The 2017 schedule version is still in draft stage. **M. Lamont** confirmed that the LHC schedule should be first approved.

Tomorrow a dedicated MD will take place in the SPS for ions. The NA will be affected.

H. Bartosik presented the Week 42 schedule proposal (Annex 10). The UA9 run is kept as originally scheduled, starting on Tuesday at 8.00 AM for 24 hours. On Wednesday, from 8.00 AM to 12.00 AM, intervention in the PS and SPS, followed by an 8 hour MD until 8.00 PM (beam back for physics).

4. AOB

The maintenance of the door YEA04.PSR=353 from Wed.12/10 08.30 AM to Fri. 14/10 12.00 AM was approved.

M. Hourican said that when the Piquets are called from the CCC, the CERN phone standard number is displayed on their phone. It was therefore difficult for them to understand they should call back the CCC. Operators should leave a message with a phone number. **M. Gourber-Pace** said that this issue is already followed-up. An update will be given at the next LMC.

Next Meeting: Tuesday 18th October 2016.

Minutes reported by JB. Lallement on 13th October.

Summary of the 35th FOM Meeting

Held on Tuesday 18th Oct 2016

Agenda (https://indico.cern.ch/event/577120)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule updates*
4. *AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.
There was no update on the 3 open actions (Annex 1).

2. Status of the machines

Linac2

D. Küchler sent the Linac2 report by e-mail (Annex 2).

- Very good availability of 99.8%.
- One 15 min stop for source interlock module exchange.
- The source parameters are still inside the limits of the operational margins. Intensity is very stable, other parameters except for the arc current have not changed since mid-September. Therefore, at the moment there are no justified worries about the availability of the source until the end of this run.

PSB

A. Findlay presented the status of the PS Booster (Annex 3).
Not the best week. The 92% availability showed on the chart is lower than in reality (~94%) because the distributor problem that was marked in the logbook as a warning did not stop the beams.

- PiPO called Tuesday for BTP.DHZ30, which developed an offset compared to the CCV. It took 1h45 minutes to get the supply repaired and the beams to the PS were unavailable during this time.

- Saturday BI2.DIS was noted to be running with 18kV in place of 22kV. Piquet intervention took 5 hours to resolve the problem and beam was back.
- A further investigation into the distributor Monday cut the beam for 50mins, nothing further found.
- The BR3.C02 cavity would not restart after the previous intervention; machine access was required to check a fan (1 h).

Comment from M. Hourican: The kicker section will deploy a 2nd scope for better diagnostics in case of similar problems with the distributor.

ISOLDE

E. Matli reported the status of ISOLDE (Annex 4).
HRS

- Target #590 installed on Friday October 14.
- Setting up of stable beam Monday October 17.

GPS - HIE

- Run with 78Zn to Miniball.
- During the run several minor problems with RF amplifiers and power supplies of the heating of the line and the target.
- The lasers needed continuous interventions to keep the power at a good level.
- On Friday vacuum glitch in the BTS line caused several power supplies to trip in the TRAP/EBIS sectors and needed an intervention to restart them.
- Saturday ~5h without beam due to a PSB problem.
- Target degraded rapidly during the weekend and the experiment was ended a bit in advance due to the low count rates.

ISOLDE Users

K. Johnston sent the report by e-mail.
'*After a quite difficult start-up the Miniball experiment ran with 78Zn from Monday evening until Sunday night. The last few days were also quite difficult with dropping yields and the suspicion is that the ion source in the target suffered as a consequence of one of the trips of the line heating during the course of the run. Nonetheless, good statistics were collected on 78Zn although the second part of the experiment (on 80Zn) wasn't possible due to the various delays at the beginning of the run.*'

PS

F. Tecker reported the status of the PS on behalf of **D. Cotte** (Annex 5). The PS had a 92% availability.

- 2/3 of the PS down time was a consequence of the mentioned PSB issues.
- Injection septum SMH42 had a broken ignition card and a setting issue.
- Broken CPU card on the cfv-269-cpsft16 front-end.

East Area

N. Charitonidis: Stable operation with all beams operating (3 spills for CLOUD).

East Area Users

No report.

nToF

F. Mingrone: The installation of the experiment in EAR2 was finished successfully.

AD

L. Bojtar said there was nothing to report for the AD.

AD Users

No report.

SPS

D. Manglunki reported the status of the SPS. It was a very difficult week with only 64% beam availability. The problems, together with their resolution timeline, and the activities are detailed in Annex 6.

- Tuesday: Fault on MBE2103, an electrical cell had to be repaired, stopping the SPS (BA2) for 7 hours. The LHC beam was available at 18:30, after a problem on the MKD had to be solved by the ABT standby person. For the fixed target beam the repair of MBE2103 took about 48 hours. During the time without FT beam, the opportunity was taken to continue the ion setting up, and to perform several interventions: The cable for the BCT in BA3 was fixed, and the ion interlock was reinstated and tested on MSE217.
- Thursday: Setting up both high pile-up beams, which were then delivered on Friday to the LHC for their MD.
- Sunday: Multiple sparking of the MKP in the afternoon required a reset by the ABT standby service.

Q. from B. Mikulec: What was the problem with the MKD?
A. by K. Cornelis: The BETS (Beam Energy Tracking System) signal was drifting causing a beam interlock.
Q. from B. Mikulec: So the problem was not with the kicker itself?
A. by K. Cornelis: Yes, however this is a part of the kicker system. The problem was related to the calculation of the beam energy from the current on a circuit.
Q. from B. Mikulec: Who is responsible for the repair?
A. by K. Cornelis: The responsibility is with ABT.

Q. from B. Mikulec: About the intervention on the UPS system that was approved by TIOC, however not consulted with the SPS operation: Could it be announced in advance and communicated directly to the coordinators of the affected machine?
A. from R. Lendru: There is a BE/OP representative in TIOC, but I will forward this request to the TIOC next meeting.
Q. from M. Hourican: Concerning the MKD kicker problem, was there any issue in contacting the Piquet?
A. by D. Manglunki: For the past months the telephone system was less then optimal (problems in reaching mobile numbers). Eventually, we succeeded to contact the ABT specialists by sending an SMS asking to call back the SPS islet on 77500: ABT is always very responsive and once the phone system eventually transmitted our text message, they called us immediately.
A. from M. Hourican: I will verify what happened. We have requested to send an email or leave a message with the name of the person to call back.

North Area

N. Charitonidis reported the status of the North Area.
On Thursday morning the NA61 VTX magnet tripped following two failures of the demineralized water circuit in EHN1. The circuit was repaired and the magnet was restarted.
During the MBE2103 stop, several access issues had to be fixed by the access piquet. As usual bad spill quality (spikes, noise) during LHC filling and ion setting up. Concerning the operations, H2-NA61 will receive primary attenuated beam from Wednesday onwards. Work notification (unlimited bends, TAXs in small range) is in preparation. T2 target intensity for NA64: No change until final confirmation (expected Thursday morning).

North Area Users

No report.

HiRadMat

N. Charitonidis said that there is nothing to report.

AWAKE

N. Charitonidis: Smooth installation phase.

LHC

M. Lamont reported for the LHC. Steady running with high pile-up. The heavy ion cycle is in preparation.
Q. from D. Manglunki: Do you still plan to take the ion beam on Friday?
A. from M. Lamont: To be confirmed.

Linac3

D. Küchler sent a report by e-mail:
'*Good beam stability and intensity (up to 40eμA in BCT41) during working hours (some microwave generator trips during the nights). Increased beam stability due to operation without TWTA.*'

LEIR

S. Pasinelli presented the status of LEIR (Annex 7).

- Operational beam
  - New TFB operational
  - EARLY > 1.6e10 charges, NOMINAL > 7.0e10 charges
  - Beam delivered to PS
- MD beams
  - Resonance compensation
  - 10Hz injection (12e10 charges with 14 injections)
- Linac 3 source refill today

Comment from D. Manglunki: Tonight there is an MD and the beam to LEIR will be back tomorrow morning.
Q. from L. Soby: Does in the future 10Hz would be normal, with more than 1.2e11 charges/cycle, as the instrumentation is designed for a maximum of 1e11?
A. by D. Manglunki: The aim was currently 9e10 charges in two bunches at extraction, but that the intensities demonstrated with 10Hz opened a new realm of possibilities, such as delivering 2 bunches of 4.5e10 charges per bunch in a shorter cycle (2.4 s instead of 3.6 s), or even delivering 3 bunches instead of 2 to the PS in 3.6 s. This is all very preliminary but indeed we need to assure that BI is not limiting the performance. Three BI representatives are invited to the bi-weekly Pb injectors performance meeting, every second Tuesday after the FOM in the CCC glass-box.

PS Ions

F. Tecker reporting for **D. Cotte**: The injection septum SMH26 had been found displaced from its nominal position and angle. The acquisition did not correspond to the requested CCV value. It retook the nominal position after touching the knobs. The injection for the ION cycles will be verified when ions are available again after the source filling.
Comment by M. Hourican: We cannot see any issue with the movement system, it works fine.

SPS Ions

D. Manglunki:

- Primary Fixed Target ion interlock reinstated on MSE217
  - DSO tests planned on 31/10 afternoon
  - Primary Fixed Target ion cycles still need to be prepared with beam
- LHC Nominal (7 injections of 4 bunches) setting-up completed on Friday 14/10
  - 1.4e8 ions/bunch
  - Extracted on both TT40 & TT60 TEDs

CTF3

P. Skowronski presented the report from **T. Persson** (Annex 8).

- CLEX safety chain was modified to include a new klystron. The DSO tests were concluded on October 13.
- Several minor troubles with klystrons, TWTAs and DL septa interlock controller.
- Optimization of the Delay Loop to reduce the factor 8 combined beam emittance
- Over the weekend factor 4 recombined drive beam for the Two Beam Module conditioning and stability studies.

TI

R. Ledru reported for the Technical Infrastructure.
There is a problem with the 400kV installation (IEFC presentation on the subject).
Explanation received by e-mail (**J. Nielsen**):
'*EDF-RTE has detected a crack in one of the three measurement transformers (TCT transformateur capacitif de tension), installed on the 400 kV breaker feeding CERN. This is the 400kV supply for CERN. So far the situation is being controlled by EDF-RTE every 15 days and they estimate an intervention needs to be done before 3 months, but this is only an estimate and can evolve.*
There are 3 scenarios to be considered:

1. *An intervention will be carried out by RTE, while the 400kV line stays powered, this would be transparent for CERN. This option is not necessarily possible, but RTE is looking into it these days and do everything they can to choose this option.*
2. *An intervention needs to be planned, we will need to switch to SIG for 3 days. If possible this could be done in January, and potentially leave CRYO running on limited capacity. This is being investigated by CRYO and EN-EL.*
3. *EDF - RTE receive an alert "abnormal voltage derive" and they will need to cut the line within 10 minutes.*

If option 3 will happen, TI will be informed and we will have 10 minutes to notify those who need to be notified. I propose that TI informs:

- *All accelerators in the CCC, and they can ramp down.*
- *The CRYO operator in the CCC.*
- *The experiments (would you confirm if it makes sense for you to know, knowing it will be minutes before the cut).*'

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule.

- UA9 is taking data at the moment.
- Tomorrow (Oct 19) there will be an injector MD.
- Tomorrow 8h-12h installation of QF probes in the SPS and the pole face winding intervention in the PS.
  Q. from B. Mikulec: Will be there any access for the Pole Face windings and in particular in the switchyard? **A. by F. Tecker:** I cannot answer now. It might be that also Isolde and

fix target beams will be stopped. **Q. from E. Matli:** Can we get confirmation before tomorrow? **A.:** Yes.

- Next week there will be another LHC MD.
- At week 46 the high intensity protons are finished (November 14 at 7h00) to prepare the RP survey. Protons and ions for the LHC only will continue.
  - Nov 14 7h00 – 12:00: only LHC ion-p beams in the injectors
  - Nov 15 12h00 – 13h00: all beam stopped (including LHC ion-p) in the injectors
  - Nov 15 13h00 – 17h00: access in Linac2, PSB, PS, TT2, nTOF and SPS for the RP survey.

  Q. from K. Cornelis: Can we continue setting up for fixed target ions?
  A.: Yes, but after 12h00 November 15 all beams have to be stopped until the access by RP in the machines will be finished around 17:00.

Q. from B. Mikulec: At the end of the run, does RP plan to do the 30h survey?
A. by H. Vincke: I will check, but I don't see a reason for that. Can you confirm that the intensities are very low?
A. from B. Mikulec: In the PS complex there will still be protons delivered to AWAKE and AD.

Q. from P. Skowronski: For week 50, are there any BE-CO interventions foreseen?
A. by A. Bland: No, because Linac2 will still be running with the new source and the LHC will be performing some tests as well.

D. Manglunki presented the specifications for the beams that will be requested for the p-Pb run. The train compositions and intensities are listed on this slide.
For protons:

- PSB provides 6 bunches.
- PS does triple splitting producing 18 bunch batch with 100 ns spacing.
- SPS takes 2 such batches. They are separated by 200 ns.

Lead ions:

- LEIR delivers 2 bunches.
- PS does splitting producing 4 bunches with 100 ns spacing.
- SPS takes 7 such batches. They are separated by 200 ns.

The quoted intensities in PSB and PS are very approximate due to potential losses along the chain. Setup of these beams is the priority for this week. They used to be played in the past.

G. Papotti presented the list of the requested beams for LHC MD5. There following special beams are needed:

- High brightness individual with 2e11 ppb and 1 μm emittance.
- 80b with 25ns spacing. The intensity is not specified because it is not an important parameter.
- BCMS with 25ns spacing, around 12±4 bunches. **Comment from K. Cornelis**: I think 12 bunches were already set up in the PS, but not in the SPS. **Comment from B. Mikulec:** If

you could add the transverse emittance constraints in the table for the 12-bunch BCMS beam. We will check in all machines if this beam was already available.

4. AOB

Didier Chapuis requested the maintenance of the PS access door YEA03.PSR=151 form October 19 8h30 to October 21 12h00. **Question from B. Mikulec:** Does it clash with the Pole Face Winding tests? **A. by F. Tecker:** I cannot answer now. I will send it by e-mail as soon as possible.
e-mail from F.Tecker:
'*There will be no access needed for the PFW MD tomorrow. So we can go ahead with the door maintenance. In any case, I just learned that we would be able to access the PS by other doors. During the MD the POPS will have to be stopped for re-cabling of one PFW. Even when POPS is on, one circuit of the PFW (FW) will be connected to a power supply that will have a new controller (FGC3). So we can't guarantee any beam for other users during the morning.*'
The intervention is approved.

BE-CO intervention on Wednesday March 15. BE-CO request a controls stop from 12:00 to 14:00.
B. Mikulec asked **M. Lamont** to include this intervention in the 2017 Injector Schedule once this will be released.
B. Mikulec inquired about the reason for the stop.
A. from A. Bland: The operating system of some computers need to be upgraded as well as the PVSS servers.

Next Meeting: 25th of October.

Minutes reported by P.K. Skowronski on 19th of October.

Summary of the 36th FOM Meeting

Held on Tuesday 25th October 2016

Agenda (https://indico.cern.ch/event/579131/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule Updates*
4. *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 35th FOM were approved.

There was no update on the three open actions (Annex 1).

F. Tarita presented the imminent risk of a power cut due to a faulty transformer in the Bois-Tollot / CERN RTE (EDF) 400kV line. The situation is known since the 14/10 and was already announced at the last LMC, IEFC and FOM meetings. Unfortunately the worst scenario becomes the only choice and the power cut is unavoidable. During the intervention period none of the injectors will be allowed to pulse and all machines must be kept idle / in standby status. The intervention date is not fixed yet, but it will take place either on Monday 31/10 or Wednesday 02/11 (most probably). The exact date will be fixed in the coming hours (days).

The **intervention** will last 10 hours and will be composed as follows:

- 2 hours for EN-EL to transfer to the Suisse network.
- 6 hours to make the line safe and RTE CT replacement
- 2 hours for EN-EL to come back to normal configuration on the RTE 400kV network.
- Final assistance to minor disruptions by stand-by teams.

During the intervention, it is requested not to operate any injector or experiments and any pulsed equipment as this could cause a total power cut on CERN site with more serious consequences.

B. Mikulec remarked that the COLDEX run is expected to finish at 8.00 AM on Wednesday.

G. Rumolo added that the MD planning was already affected in the previous weeks and is becoming very tight. If the intervention takes place on Wednesday, the MDs should be rescheduled.

J. Ferreira asked if accesses to the injectors could be possible during the intervention. **F. Tarita** answered that the LHC ventilation system will be affected, so there will be no access in the LHC while the injectors are not concerned.

After the meeting, it was confirmed that the intervention will take place on Wednesday 2nd November from 6.00 to 16.00. All accelerators and experiments should be stopped before the intervention start. The COLDEX start time will be adapted accordingly.

2. Status of the machines

Linac2

M. O'Neil reported the status of the Linac2 (Annex 2).

It was a perfect week with 100% availability. The proton source parameters are very stable and the flashover rate is now back to the normal value (1 to 2 per day).

PSB

G. P. Di Giovanni presented the status of the PS Booster (Annex 3).

The week was only perturbed by a major fault on the C16 RF cavity that occurred on Thursday afternoon. At 15:00 the C16 went off because of a water leak on a water hose on one of the Finemet power amplifiers that came loose and sprayed water mainly onto the wall. The water that was spraying around was flowing into the drainage channel and, by chance, gathered in the reservoir below the C16 in the next section. The RF expert performed an access together with CV and started to pump out the water. The beam was restarted around 17:40, but without switching on the C16 cavity to let the system dry over night. The PSB nevertheless managed to provide beam for physics, included LHC, but in degraded mode. The fixed target program suffered from the reduced intensity, but for LHC the general specifications were degraded only by about 5%. Because of this incident the Finemet reliability run was temporarily stopped over the week-end and resumed yesterday.

ISOLDE

E. Siesling reported the status of ISOLDE.

It was a very dense week for HRS with a difficult setup for the Miniball experiment of 132Sn due to the high energy (5.5MeV/u) and high A/q (4.26). And also due to the fact that the 132Sn is coming out of the target as a molecule 132Sn34S (mass 166), which is then broken up later in the REX TRAP, stripped to a charge of 31+ and sent via the REX separator into the REX and HIE linac before reaching the Miniball experiment at the end of the XT01 HEBT line. The high energy and A/q requires that the REX and HIE RF to run close to their maximum. The setting up was completed on Wednesday evening and the radioactive 132Sn was provided to Miniball during the following night (ahead of schedule). The run went relatively smooth, but unfortunately with a slow degradation over time of counts at Miniball, which was by Sunday evening a factor 5 less compared to Thursday (partly due to a lower yield from the target, the other cause was not found yet). The users were very happy. From the physics point of view there are still some open questions on the composition of the 132 beam coming to Miniball. There is 132I

(Iodine) and 132Sb (Antimony) contamination and others expected and some analysis will need to be carried out in the coming days as well as an accurate energy measurement.

On the GPS side, a short GPS run was squeezed in for the new VITO line tests. A used target was clamped on Tuesday. The tests took place during the night from Tuesday to Wednesday.

ISOLDE Users

K. Johnston said there was not much to add to the very detailed report from ISOLDE. The run with 132Sn at 5.5 MeV/u was very challenging and the users really appreciated the effort of the ISOLDE team.

PS

F. Tecker reported the status of the PS (Annex 4).

The PS had a good week. The main problem was caused by the water leak on the Finemet cavity in the PSB, which entailed 16 hours of degraded beam from the PSB. Most of the beams could be delivered anyhow. On Friday, 2 hours downtime was caused by faulty cavities (C86 and C96) and 1.5 hours downtime on Sunday due to a power supply problem for the injection septum 42. On Saturday, a water station PLC problem made the East Area beams unavailable during 3.5 hours. A new power converter regulation was successfully tested with one of the pole face windings and is used in operation now. A LHC BCMS beam with 12 bunches was prepared and is available. A low intensity beam with 18 bunches of 2.1e10 protons per bunch and 100ns spacing is being prepared for the p-ion run, but the splitting is very sensitive. The PS will stop today, from 11.45 to 12.00, to test a new power regulation. The integrated intensity delivered to ToF is 1.1% above schedule.

D. Manglunki suggested that for the LHC100 bunch splitting, increasing the intensity from the PSB could help the stability issues as the excess beam can be scraped in the SPS. For the longitudinal emittance issue, the triple splitting should be performed at low energy as it used to before LS1. This will be discussed between the machines.

S. Deleval said that the issue of the East Area cooling plant PLC is not solved yet. He proposed to have an intervention during the stop of next week.

East Area

B. Rae said that, as already reported, 4 hours were lost due to a PLC of the cooling system. Otherwise it was a very stable week.

East Area Users

H. Wilkens confirmed that the users were happy.

nToF Users

F. Mingrone said that there was nothing special to report.

AD

P. Freyermuth reported the status of the AD (Annex 5).

It was a very good week. Besides the problems in the injectors, there was only one problem related to the DR.BHZTR20.21 power supply that caused a downtime of 1h45.

AD Users

H. Wilkens said that no issue was reported from the users.

SPS

H. Bartosik reported the status of the SPS (Annex 6).

It was another busy week for the SPS, with the UA9 run, a dedicated MD on crystal slow extraction and the ion beam extraction to the LHC in addition to the normal North Area physics and LHC proton filling. The main downtime for the NA was due to the injectors' issues. The 24h UA9 run started as planned on Tuesday in the morning. The coasts were only interrupted by LHC fillings. The beam was stopped Wednesday morning for the planned access for the relocation of the voltage probes on the QF circuit for localising the earth fault. In parallel, vacuum experts investigated on a vacuum problem on the ring quadrupole QDA 219 at the end of LSS2, which appeared Tuesday night. No leak could be found, so it was decided to resume operation. The pressure level slowly recovered and is now at around 1e-7 mbar. Wednesday afternoon was devoted to the dedicated MD on crystal assisted slow extraction. In the evening the 72 bunch standard 25 ns beam was sent to the LHC for the e-cloud verification fill. High losses at injection were encountered in the LHC and consequently the LHC filling was performed with rather high scraping of almost 10% in the SPS. On Thursday the internal interlock on the MSE/MST extraction septa for the North Area was triggered due to an intervention on the electronics card for the ion interlock. The reset required an intervention of the EPC expert and the DSO (1.5 hours downtime). To counteract the issues with sparking on the MKP4-L injection kicker module, the voltage balancing was changed by TE-ABT experts. The MKP-L has now a 28% reduced voltage compared to the MKP-S. The reduced kick strength affects only LHC beams and was compensated on all operational users by adjusting the injection steering. The ion beam could be successfully injected into the LHC on Friday afternoon. The weekend was rather calm with only minor downtime for the North Area.

North Area

B. Rae reported that the bad spill structure severely affected the high-intensity users, in particular NA62, forced to reduce very substantially their beam intensity. NR22-010 (BEND.021.083) had many trips and needed Firstline interventions. In general many power converters tripped over the week. Another water pump burned on Friday in BA81 and was quickly replaced by a spare. On Sunday the STI piquet had to reset a timeout on a TAX movement in H8. On Monday the BEND.022.499 tripped on coil

temperature while trying to go to maximum current. Possibly due to an attempt to maximize its water flow, the BA81 water cooling tripped on Monday.

North Area Users

H. Wilkens said that the NA64 experiment needs high intensity electron beam in H4, therefore the target intensity was increased on T2 to 40 units (1e10 protons/cycle). The intensity sharing is now: T2=40 units, T4=25 units and T6=~70 units. The protons for NA64 were taken from the COMPASS experiment, which now receives about 30% less than in the past months. It is therefore important to keep the SFTPRO cycle close to the allowed limit of 2.2e13 protons in the SPS.

HiRadMat

B. Rae said there was nothing special to report.

AWAKE

E. Gschwendtner sent a mail summarizing the AWAKE status: *"Concerning AWAKE, note that we will have another beam commissioning period in AWAKE starting on Monday, 31 Oct for 2 weeks until 13 Nov 2016. We will align the proton and laser beam through the complete plasma cell that is now installed (1cm diameter iris) followed by experimental detector commissioning. However, during this period we plan to have some days of interruption for installation."*

LHC

J. Nielsen reported on the LHC status. The LHC had a very smooth run over the last week. Many tests were done (high pile-up, crossing angle luminosity tests, E-cloud fill…). Last week, the CMS integrated luminosity reached 40 fb^{-1}. A first ion beam was injected for setting up on Friday. The physics run will last until Thursday evening at 11.00 PM when the MD will start.

Linac3

M. O'Neil reported the status of the Linac3 (Annex 2).

The source restart went pretty smoothly after the oven refill on Monday. The intensity delivered was around 38 µA and the TWTA was removed during the refill.

B. Mikulec asked why the TWTA was removed. **M. O'Neil** answered that **D. Kuchler** wanted to test the source stability once TWTA removed.

LEIR

J. Axensalva reported on the LEIR status (Annex 7).

It was a short, but good week for LEIR. The only downtime (2 hours) was due to a quadrupole power supply failure in the ETL line. On Friday, injection tests were successfully performed to the LHC and the

beam intensity during the all week was pretty good and stable (above 8.0E10 for the NOMINAL production beam).

PS (ions)

F. Tecker reported the status of the PS with ions (Annex 4).
LHCION Nominal (ION1 and ION2) were delivered over the week.

SPS (ions)

H. Bartosik reported the status of the SPS with ions (Annex 6).

The injected intensity is beyond the LIU target (8.5e10 charges). The extraction to LHC was successful (at least for beam 2). All looks good for the ion cycle.

CTF3

D. Gamba reported the status of CTF3 (Annex 8).

Some more conditioning is needed on PETS and ACC structures to achieve record acceleration. The factor 2 recombination was further optimized in the DL. There was no dogleg operation over the week-end. It will resume next week-end. Some MTVs are still having problems. Investigations are ongoing.

TI

J. Nielsen reported on the eventful week. On Tuesday, the BA81 cooling station was stopped by the fire brigade, as a pump had caught fire. The circuit was switched to the spare pump and restarted. On Wednesday the LHC 8 CRYO tripped when communication was lost to a PLC. The piquet for the PLC and TI went on site and had to be escorted by the fire brigade since the lift was broken at the same time. On Friday some smoke came from a pump for the demineralised water station in BA81. It was restarted with a second pump after the intervention of the fire brigade and TI. On Saturday, the cooling station for the PS (FDED-00052) tripped. The PLC was restarted and the station restarted normally. No particular problem was found.

3. Schedule updates

B. Mikulec presented the injector schedule v 2.1 (Annex 9).

H. Bartosik presented the COLDEX run tentative planning (Annex 10):

- Stop all beams in the SPS at 8:00 on Tuesday 1/11.
- Access for COLDEX at 8:30 after 1/2h cool-down time.
- Stop all beams in the SPS on Wednesday 2/11 at 06:30.
- Access for COLDEX at 07:00 after 1/2h cool-down time.
- After COLDEX has been moved OUT (at 08:00), start with ion dedicated MD.

Given the intervention on Wednesday 2/11 on the electrical network, the COLDEX run will have to stopped earlier than 6.30, as presented. **The planning will be updated accordingly**.

D. Manglunki added that the NA DSO test with ions is scheduled on Monday. A proton beam will be needed to perform the tests.

4. AOB

- The maintenance of the door YEA01.PSR=193 from Wed. 26/10 08.30 to Thu. 27/10 17.00 was approved. Next time an access door maintenance is announced at the FOM, a map with its location will be shown.
- The INCA team will deploy the synchronization mechanism for the data propagation from CCDB to LSADB. The intervention will last 1 hour. It was decided to have it in the shadow of the intervention on the electrical network, on Wednesday 2nd November.

Next Meeting: Tuesday 1st November 2016.

Minutes reported by JB. Lallement on 26th October.

Summary of the 37th FOM Meeting

Held on Tuesday 1st November 2016

Agenda (https://indico.cern.ch/event/580361)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule updates*
4. *AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.
There was no update on the three open actions (Annex 1).

2. Status of the machines

Linac2

M. O'Neil reported the status of the Linac2 (Annex 2).
Availability was 97%.

- On Tuesday gas flow in the source had to be increased after the observation of around 10% missing pulses.
- On Saturday just after 6am the PSB operator had to call in the Linac2 SV and the RF specialist, as the RF of the RFQ and tank1 had tripped. The Linac2 team needed to exchange the crowbar ignitron trigger module. After this intervention the RFQ was not yet perfectly stable and the issue reappeared. Yesterday additional diagnostic equipment was installed. Hopefully it can be fixed tomorrow during the power cut.

Performance of the source is stable and there is still margin for intensity increase. Flashover rate dropped to 1 per week.

PSB

B. Mikulec presented the status of the PS Booster (Annex 3).
The availability of 86% quoted by the elogbook statistics was in fact ~95%. A water leak of the Finemet cavity happened again (1 week after the first leak), what provoked the C16 cavity trip. The C16 had to dry out over night. For the moment the Finemet reliability run is stopped. The ring 3

C16 gap relay was changed in parallel, which allowed to provide almost the nominal intensity for all beams already during the night, contrary to the week before. Tomorrow there is an intervention foreseen to check once more the cooling circuit of the Finemet..
Comment from C. Rossi: The Finemet reliability run is definitely postponed to next year, because during the power cut it is not possible to perform all the investigations.
Issues:

- The front-end computer for kickers had to be rebooted several times during Thursday night. The CPU card will be changed tomorrow.
- Wire scanner LTIM errors requiring ~daily initHW.
- Synchronisation frequency error: Oscillating between 2 values ~200 Hz for dump/ISOLDE destination; Highland exchanged with spare, but didn't help. Currently fixed frequency signal generator installed; being followed up by LL-RF controls team. This problem already happened in the past.

LHC100ns p beam is ready.

Comment from J. Nielsen: This time the water leak was handled much better because the water could quickly be shut down remotely; also the alarm worked properly so the problem was spotted immediately.

B. Mikulec mentioned that the plan for the EYETS is to reroute the water flow such that in case of a water leak of any equipment the C16 cavity will no longer be inundated.

ISOLDE

E. Fadakis reported the status of ISOLDE (Annex 4).
GPS delivered 9Li3+ beam with record energy per nucleon of 6.88MeV/u. Also new record for SRF gradient. Tests performed with radioactive beam from HRS to the new tape station. Collections of 128Sn on HRS on Wednesday night.

Issues:

- Synchronization between REXTRAP REXEBIS caused beam loss (2h to solve). Subscriptions are lost and they need to be restarted in the Working Set. But other applications also suffer. There was a ticket opened.
- FESA class for Faraday Cup needed frequent restarts and users could not open the application.
- Series of RF trips:
    - SRF: 8 trips, 7 from XLL2 CAV2 (~40' downtime)
    - REX RF: 14 trips of 7GAP1 (~3.5 hours downtime), 3 trips of 7GAP3 (~45' downtime)

  7GAP1 is particularly troublesome because restart has to be done locally downstairs, what takes 15 minutes.

Q. from B. Mikulec: Can it be implemented in remote control?
A.: We requested it, but I have no news about it.
J.A. Rodriguez: I doubt it will be implemented soon as it is an old and complex equipment.

ISOLDE Users

K. Johnston. Busy week. This was the first week of the second beamline of HIE-ISOLDE (XT02) commissioning. The experiment used 9Li beams for transfer reactions in a new scattering chamber. Although there were doubts about the production of the beam and also some questions about the alignment of the experiment inside the chamber, the experiment was mostly successful and extremely useful information was gained prior to a more sustained use of this setup in 2017.

Comment from L. Soby: The problem with Faraday Cup is already fixed.

PS

M. Fraser reported the status of the PS (Annex 5).
This week no major problems in the PS with most downtime due to upstream machines and greater than 94% average availability. In the PS just one issue on a HV interlock of KFA21 required piquet intervention causing downtime for MTE during 3 hours. Degraded mode in PSB with C16 was rather transparent for the PS: MTE and AD not perturbed thanks to the R3 C16 gap relay repair. LHC100 18b beam is ready and RF specialists have also provided a version with splitting at low energy (1.4 GeV) that should be sent to SPS for setting-up. EAST IRRAD-CHARM would like an extra spill (4 per SC) to be shared in agreement with EAST North (CLOUD). Ions sent to SPS as setting-up continues.

MDs: LHC25 12b BCMS and LHC25 80b were sent to the LHC.

East Area

B. Rae: On Wednesday the BVT termination box in T11 zone had a problem stopping ZT11.BVT01 for a few hours. Demineralized water will be stopped for few hours tomorrow.
Comment from R. Langlois: The intervention on FDED-00052 will be shifted by a few hours due to some delays in spare part delivery. The station will be stopped from 10:00 to 14:30.

East Area Users

H. Wilkens: Happy Users. Asking for increased intensity spills.

nToF

D. Macina: No special news, taking data goes well.

AD

B. Dupuy reported on the AD status (Annex 5)**.** Very good week, exceptional quality of the beam. 2 problems:

- Friday from 23H50 to 1H00: Unsafe conditions for AEGIS beam line as beam stopper was not in safe position and laser room was unlocked during access. Therefore, the injection power-supplies were switched off (DI.BHZ6035,35,44 and 45 require between 12 and 24 cycles to restart (110sec x 24cy.).
- Saturday 10H00: Reset of the AD Stochastic Cooling amplifiers by CCC.

AD Users

H. Wilkens: Users confirm very good beams.

SPS

F.M. Velotti reported the status of the SPS (Annex 6).
An average week for the SPS, with 90% beam availability for fixed target experiments.
Main problem were recurring trips of TRX-7, which was solved by changing a card.
All LHC MD beams were provided including 12 bunch BCMS.
Optics measurements for HiRadMat are ongoing. Ion cycle is being optimized.
Yesterday beam was successfully transported through irises at the beginning of the plasma cell in AWAKE.

The ripple measurement campaign determined that QF120 is the problem. In order to exchange it during the power cut tomorrow, COLDEX run was postponed to Saturday 8AM to allow the magnet exchange tomorrow (because it was likely to have increased radiation in the machine). The dedicated MD (ions) was moved to today, and thanks to this the radiation level shall be acceptable.
Q. from B. Mikulec: Is there a possibility that the magnet is OK, but the bus bar is faulty? Do you plan to check this?
A from V. Kain: Yes, the first point of the intervention is the local inspection of the bus bar.

Q. from D. Manglunki: What was the batch spacing? We need 200 ns for the p-Pb run.
A.: It was 225 ns, but 200 ns should pose no problem (still to be tested).

North Area

B. Rae: Good week. Still suffering from instable conditions due to the QF ripple in SPS. Another DSO test has to be scheduled.

North Area Users

H. Wilkens: H6 and H8 have many users because everyone wants to finish before the end of the year. Hopefully the beam will be more stable after the magnet exchange.

Comment from L. Gatignon: I would like to thank COLDEX for the flexibility concerning the move of their run.

HiRadMat

No report.

AWAKE

No report.

LHC

Mike: The very successful proton run was finished on October 26 gathering a total of 40 fb^{-1}. Afterwards this many different beams were requested during the MD block.

Linac3

M. O'Neil reported the status of Linac3 (Annex 7). Good week with most of the time above 35uA delivered. The oven refill was rescheduled to Wednesday during the power cut.
Issues:

- On Wednesday primary ion pump on source extraction failed and was replaced
- Towards the end of the weak overnight drops because constant manipulation is needed to keep the source intensity steady.

Q. from D. Kuechler: When exactly Linac3 should be stopped?
A. by D. Manglunki: Today around 6PM.

LEIR

A.E. Angoletta reported for LEIR (Annex 8). Close to 100% availability for the week as of 31/10 evening. Intensity from Linac3 dropped several times over the weekend, but it did not happen when beam in/from LEIR was used and quick interventions by Linac3 support solved the problem.
On Wednesday vacuum pump was changed in Linac3. LEIR has provided ions to SPS from Wednesday to Friday: NOMINAL + low-intensity NOMINAL (1 injection only) + EARLY beam.

On Thursday LLRF optimized for operation with CRF43. Cavity CRF41 will remain the operational cavity for the 2016 LEIR run, but now very easy (3 clicks) to change cavity whilst keeping the same performance in case of troubles.

On Friday BI MD to upgrade to FESA3 some BPMs in extraction line. Rollback to PPC4 + FESA 2.10 needed since SIS33 boards firmware is not compatible with Linux (will have to be changed).

PS Ions

Nothing to report in addition.

SPS Ions

F.M. Velotti: Currently running MD on ion cycle optimization (tune at FB, PS-to-SPS transmission).

Comment from D. Manglunki: The DSO tests for primary ions in the North Area took place on Monday 31/10 from 14:00 to 16:00. One of the tests could not take place: It was impossible to actually simulate the accident where an SFTPRO beam is executed while the key is in the ion position. This is due to additional safety measures, which have been implemented at the SIS and MTG level. The OP crew was able to mask the SIS conditions, but the MTG specialist was unreachable in a meeting. All the other tests were satisfactory, but this accident simulation will have to be performed at a later date, tentatively 14/11 in the morning, before the beam permit can be signed, and primary ion beams sent to the North Area.

CTF3

F. Tecker reported for CTF3. CTF3 had some issues last week:

- Lost a morning with a quadrupole problem in the beam-loading experiment, which turned out to be a problem with a temperature sensor. Thanks to the magnet colleagues for fixing the problem.
- The pneumatic system for an MTV screen broke, obviously due to radiation damage. This was repaired during an access yesterday afternoon.
- A problem with the access system blocked someone in the PAD. The access team unblocked the situation but the problem will need to be fixed on Wednesday.

Otherwise, the Delay Loop optimisation continued and had a successful run over the weekend for the beam-loading experiment. Thanks for the help of the CCC operation team.

TI

J. Nielsen reported for TI (Annex 9).

- Tuesday 14:30 FDED-00065 cooling station trip.
- Wednesday 07:42 electrical perturbation.
- Saturday 15:35 problem on GSM network. Many people could not use their phones. The call came through, but without voice. There was a problem with the transmitter on top of the water tower on the Meyrin site; it was fixed in the morning.

Q. from M. Gourber-Pace: Are you going to implement an additional fault category corresponding to phone network issues leading to beam time in the e-logbook, as it was requested by R. Losito during the last IEFC?
A. J. Nielsen: These issues are also discussed every Wednesday during some TI meetings.

Comment from D. Manglunki: We need to see how much GSM problems affect the uptime of the accelerator complex.
A. from S. Pasinelli: I will implement it ASAP.

J. Nielsen presented the planning for the EDF intervention on Wednesday November 2 (Annex 10). Coordination will be done from the CCC to assure that equipment is switched off in the proper order, particularly the compensators for SPS and PS after the accelerators are stopped. All the machines need to be stopped by 5h50. 6h00 to 8h00 EN-EL will transfer the general network to SIG.
8h00 to 14h00 – 14h30 EDF-RTE intervention on the 400kV network. 14h00 – 14h30 to 16h00 - 16h30 EN-EL will transfer the general network to EDF-RTE.

60 MVA is the hard limit; therefore it is requested to reduce the power consumption as much as possible. According to measurements of today it will be very close to this limit. In case we will exceed the limit, the following networks will be cut off (in this order):

1. Réseau pulsé
    a. 1. SPS (BA1, BA2, BA3, BA4, BA5, BA6, BA7).
    b. 2. Zone Nord (BA80, BA81,BA82).
2. 2. Réseau machine Meyrin
    a. (ME6, ME25).
    b. La boucle PS.
    c. Isolde.
3. Réseau normal Meyrin
    a. Zone Ouest (ME59, ME62,ME71, ME50).

Q. from B. Mikulec: Is this compatible with the SPS magnet change?
A.: The electricity for lights and regular plugs are not part of these networks. However, in case the 60 MVA limit is hit and all electricity is cut naturally these will also be affected.

Q. from D. Cotte: At PS we have one power supply we would like to restart right after the switch is done, in order to perform validation of its new operation mode.
A. N. Bellegarde: No, no pulsing device is allowed during the time the electricity is provided by SIG.
Q. from D. Cotte: We need to perform the test with MTE cycle and it cannot be postponed to the ion run. Therefore, we would like to ask to delay our restart by 1 hour, during which the tests would be performed. It will delay the restart of beams for AD, East A and nTOF.

1 hour delay for the PS beams was approved.

3. Schedule Updates

B. Mikulec presented the latest version of the updated injector schedule.

EDF intervention is on Wednesday. The COLDEX run is moved to Saturday. The LHC ion beams are scheduled for Saturday.
Comment from M. Bernardini: Only on Thursday we will know how many revalidation tests will be needed to restart the LHC, so the time when the beams are expected back can only be known then.

Comment from RP representative: For the PSB accesses tomorrow RP enters with the intervening groups for local surveys; accesses from 9:30AM. For the PS, a complete machine survey will be done, and accesses will be allowed from 10AM.
The operational IMPACTS should be suspended and special IMPACTs for this intervention period used.
B. Mikulec: I am not sure this was well announced and the groups implemented it this way.
We need to clarify this for the future in case of longer stops that were originally not planned.
M. Bernardini: This is not a technical stop, so this is under OP supervision.
R. Steerenberg: In some machines it is declared as Technical Stop 4. (After the meeting it turned out that there is only a tag with the name 'ITS4' in IMPACTs of the CPS, but IMPACTs still have to be declared under the operational period).
B. Mikulec: A message will be sent out to the machine coordination lists after the meeting to be sure the information has reached everybody involved.

4. AOB

No AOB.

Next Meeting on November 8th.

Minutes reported by P.K. Skowronski on November 2.

Summary of the 38th FOM Meeting

Held on Tuesday 8th November 2016

Agenda (https://indico.cern.ch/event/585952/)

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 37th FOM are approved.

Concerning the open actions, the action for TE-EPC on the SPS QF ripple issue can be closed (see SPS report) (Annex 1).

2. Status of the machines

Linac2

M. O'Neil reported the status of the Linac2 (Annex 2).

The ignitron of the RFQ and tank1 was replaced during the stop on Wednesday and it solved the RF instability issue. The source was tuned on Thursday to reduce the number of missing pulses and restore the beam intensity. The linac was stopped for 20 mins on Friday when the LEIR water station pump was exchanged. The tank2 pre-driver tripped yesterday evening and was replaced by a spare. The fault induced a downtime of 1.5 hours.

Since last night, at 1.00 AM, the linac is stopped because of two major RF issues:

A jitter was observed on the tank1 high voltage. RF specialists were currently investigating this issue.

One of the two movable tuners of the RFQ was stuck inside the tank. The plan is to fix it at its average position and operate the RFQ with only one tuner until the EYETS (as it has already been the case in 2008). The repair of the tuner would require venting the RFQ, which will be done only after the end of the run.

At the time of the meeting, it was difficult to give a time estimate on when the linac could be back in operation. The Linac2 supervisor will keep the CCC informed in order to adapt accordingly the LHC operation over the next hours.

PSB

J-L. Sanchez presented the status of the PS Booster (Annex 3).

The week was dominated by the EDF intervention and Linac2 faults. The few other issues that occurred over the week are listed in the following. Since the beginning of the week some drift was observed on the external synchronisation frequency. A malfunction of the Highland generator was suspected, and eventually the external 10Mhz clock was found drifted by approx. 1.2 kHz. As the same 10 MHz source is used for the LL clock, it can probably explain why occasional problems synchronising also with the PS occurred several times in the past. A 50 min downtime for ISOLDE was caused by issues with the SIS (the specialists had to restart the server). A slow drift of the septum BT4.SMV10 current was observed again. The extraction kickers tripped with LV-Interlock; some humidity was found on the leak detector by the specialist. The induced downtime was 1 hour.

M. Hourican said he had no update to give on the kickers issue. He will follow this up with the specialists.

ISOLDE

J. Alberto Rodriguez reported the status of ISOLDE (Annex 4).

It was a very good week for ISOLDE and there were no major issues to report. The 9Li beam production at 6.8 MeV/u for the Scattering Chamber experiment located at the end of the second HIE ISOLDE HEBT was stopped on Tuesday, and the preparation of the next experiment (66Ni at 4.5MeV/u to the end of the first HEBT line) directly followed. The low energy part of the machine was prepared on Thursday and Friday morning and the beam was ready for the Miniball users on Friday afternoon (half a day ahead of schedule). However, due to some problems in the experimental station, users couldn't take the beam before Friday evening. In addition to HIE-ISOLDE, the target installed in the HRS was irradiated (for a radiation test for the European Spallation Source) on Wednesday and Thursday.

ISOLDE Users

K. Johnston confirmed it was a pretty good week for the users with the end of the first experiment on the second HIE ISOLDE beam line. The irradiated target will be shipped to Copenhagen.

PS

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

The PS had a very good week despite the EDF power cut, with an average beam availability of 91%. The PS recovered quickly after the power cut, and an MD for an improved regulation of a power converter for the pole face windings could be performed during the restart. The MTE beam was stopped for 2 hours and the EAST beams were perturbed for 20 mins because of issues with the KFA21 kicker and the SMH57 septum, respectively.

The low intensity beam with 18 bunches of 2.1e10 protons per bunch and 100 ns spacing with triple splitting at 1.4 GeV was delivered.

The requested integrated intensity of 1.9e19 protons for nToF was achieved on Sunday.

H. Vincke asked whether the beam intensity requested for the LHC (18 bunches * 2.1e10p) will be kept until the end of the run. **D. Manglunki** answered positively.

East Area

B. Rae said it was a very good week.

East Area Users

H. Wilkens confirmed the users were happy.

nToF Users

D. Macina said it was a good week.

AD

L. Bojtar reported the status of the AD. It was a pretty good week with only minor problems.

AD Users

H. Wilkens said users were happy.

SPS

H. Bartosik reported the status of the SPS (Annex 6).

The week started smoothly with North Area physics and AWAKE commissioning.

The 10 hour dedicated MD on Tuesday was devoted to emittance growth and transmission studies with the long LHC ion cycle during which the Beam Gas Ionisation monitor could be tested.

In parallel to the EDF intervention on Wednesday, it was planned to exchange the QF120 quadrupole since EPC had localised the earth fault responsible for the QF glitches close to this magnet. However, it was finally not necessary to exchange the magnet, as during inspections of the busbar, a damaged insulation and signs of sparking between the busbar and the busbar cover were found. The problem was solved by enlarging the hole in the busbar cover leaving more space for the busbar and replacing the insulation. After this intervention, no more glitches of the QF circuit could be observed so far **(the action was closed**). The 25 Hz component in the spill was stronger at the startup and changing to the QS spare power converter did not improve the situation. It was not observed anymore on the QF since

yesterday. About 2 hours without beam would be needed by EPC for tuning the QS power converter to behave like the QF.

On Thursday a fault on an 18 kV cable between BE and BA2 caused about 1 hour downtime for the North Area. Operation could be resumed after a reconfiguration of the network by EL. Friday was devoted to the 24 hour MD for COLDEX. The restart for physics on Saturday morning was a bit difficult, as unusual losses in LSS6 were encountered with the fixed target beam just before transition crossing. After a few hours of investigations it was figured out that the problem was related to the main quadrupole power converter configuration. In the night before COLDEX the SPS was running with QS-QD for investigations on the 25 Hz ripple, which requires a different setting on the tunes in H and V. On Friday morning, before starting with COLDEX, the mains configuration had been changed back to QF-QD and the corresponding tune functions on the SFTPRO cycle were re-loaded, but not tested with beam. The problem was resolved by switching back to the QS-QD configuration and the corresponding tune trims. The electrical glitch on the 400 kV network on Sunday evening tripped two cavities. The beam was back after around 1h.

B. Mikulec asked whether it was planned to check all the bubars during the EYETS. **C. Mugnier** answered that they will certainly check them. **H. Vincke** commented that some of the busbars being located in quite hot areas, they should be checked toward the end of the EYETS.

H. Vincke asked if the losses in LSS6 were important and if they should expect the area to be abnormally activated. **H. Bartosik** answered that it happened only for a short time, and the cause of the losses was now fully understood.

North Area

B. Rae reported it was a good week for the North Area.

North Area Users

H. Wilkens said that the North Area experiments benefited a lot from the identification and repair of the ground fault on the circuit of QF120. As the magnet didn't need to be exchanged there was a significant gain of physics beam time. This week there will be a couple of changes on the target intensity sharing, after the MD, NA will go to T2/T4/T6 = 15/25/110 as the NA64 experiment completed its run and to allow COMPASS to perform calibration studies. Then Thursday NA will go to T2/T4/T6 = 15/60/65 so that NA62 can take data close to nominal intensity for the last days off the proton run.

HiRadMat

There was no report.

AWAKE

J. Schmidt reported the status of AWAKE (Annex 7).

The proton beam was aligned with the plasma cell iris, the beam and laser diagnostics were aligned and the software checkouts were successful. They had some troubles with the SPS extraction kickers, which were solved by the specialists.

H. Vincke asked whether they had an idea of the loss level they had in some quadrupoles. **J. Schmidt** answered they already asked BI to move the BLMs closer to the loss location. The losses might be explained by the beam tails; they will probably disappear when switching to nominal beam parameters.

LHC

R. Steerenberg reported on the LHC status. The LHC was in technical stop until Saturday afternoon and the cryo was not affected by the intervention on the 400 kV network as much as anticipated. Loss maps were being made since Sunday night. As soon as Linac2 is back, they will inject protons and ions.

Linac3

M. O'Neil reported the status of the Linac3 (Annex 2).

The ovens were refilled on Wednesday, during the EDF intervention, and the beam was available to LEIR on Thursday. The linac was stopped on Friday for the intervention on the cooling water pump and the restart took 2 hours because of problems with the buncher restart. The source tripped on Sunday evening and was restarted after 30 mins.

D. Manglunki asked if the source could have been reset remotely. **M. O'Neil** answered positively, but the supervisor did not had remote connection. It could even have been done by the SPS operators; for this purpose he will prepare a procedure.

LEIR

D. Manglunki reported on the LEIR status (Annex 8).

It was another good week for LEIR.

On Monday one of the SEMgrids in the injection line, ETL.MSF10, showed a problem due to lack of compressed air. As it is located in the switchyard, the intervention had to wait for a PS stop.

On Tuesday the NOMINAL beam was delivered to the PS and the SPS during the day, then LEIR was turned off at 20:00 in anticipation of the power reduction needed for the EDF/RTE intervention at 6:00 the next day.

On Wednesday, in the shadow of the electrical intervention, the Linac3 source was refilled, the compressed air restored on ETL.MSF10, and LEIR was accessed for inspection of the Btrain measurement coils. The machine was restarted in the afternoon after TI gave the OK. ABT and EPC had to intervene to restart the extraction septum SMH40 and one magnet in the ejection line EE.BHN1020. The Linac3 beam was available on Thursday at 8:00 and it took a while to get it accelerated and extracted due to controls problems on several power supplies (ITE.BHN10, ER.QDN1030). Also for some reason the electron cooler functions were found disabled on the EARLY beam.

On Friday morning, the Linac3 team took the beam for a dedicated MD. In the shadow, an intervention took place on the linac/LEIR water station. The machine was turned off before the water was stopped, but restarting it needed the intervention of the EPC Piquet and the BI specialists, as collateral trips of the HV supply, RF cavities and the cooling pump for the ecooler had resulted from the water intervention. The transverse damper had tripped too, but could be reset remotely. The beam was ready at 15:00. In the afternoon the software and hardware of the extraction pickups was rolled back, as the new version still did not work after the third attempt. The next attempt will be performed around Easter next year. At the end of the day the NOMINAL beam was fine-tuned, reaching over 8.3e8 ions/bunch at extraction. This beam was left running over the week-end to monitor the evolution of the performance.

On Sunday, the EARLY (single bunch) beam started to be delivered to the LHC for setting up the p-Pb run, and at 21:00 an electrical perturbation (glitch on 400kV) tripped the RF cavity ER.CRF41, which could be reset from the CCC.

Yesterday, analysis of the week-end performances showed the effect of the BIPM electrodes. Investigations are on-going.

PS (ions)

F. Tecker said there was nothing special to report.

SPS (ions)

H. Bartosik reported the status of the SPS with ions (Annex 6).

The LHC ion cycle is now in very good shape (achieved 1.9e8 Pb82+/bunch). The BGI could be successfully tested and BI will investigate whether the signal amplitude could be improved in the horizontal plane.

CTF3

F. Tecker reported the status of CTF3 for **D. Gamba** (Annex 9).

They had an issue with the access system of LINAC/DL-CR. It will be investigated next time an access is planned. The machine recovered very well from the EDF intervention on Wednesday.

TI

J. Nielsen reported the events of last week (Annex 10).

The EDF intervention went very smoothly and CERN was repowered at 13.30 on Wednesday afternoon. On Thursday, a SPS pulsed loop tripped. The fault was quickly isolated to a cable between the BE and the BA2 and the SPS was repowered on "antenna". The BA81 raw water tripped and CV is investigating the cause of the fault. On Friday, the LEIR water cooling pump was replaced. On Sunday, at 21.00, an electrical perturbation occurred (13% for 70 ms – confirmed by EDF). Power converters tripped in TI2 and TI8 because of blown fuses on the cooling circuit, which were replaced by CV.

3. Schedule updates

B. Mikulec presented the injector schedule v 2.1 (Annex 11).

High intensity proton physics is scheduled to stop on next Monday at 6.00 AM. In reason of a VIP visit in the LHC on Tuesday afternoon, after which the LHC would like to restart immediately, and in order to keep the 30 hours cool down time, **H. Vincke** asked to stop the high intensity beams 1 or 2 hours earlier. **R. Steerenberg** said that the decision will be taken later. For the moment, the end of the HI proton physics is kept on Monday at 6.00 AM.

H. Bartosik confirmed there will be a dedicated MD in the SPS tomorrow.

D. Manglunki added that the Linac3 oven refill is scheduled in the shadow of the RP survey.

B. Mikulec asked whether MDs with protons would still be possible after the RP survey.

For what concerns the SPS, **H. Vincke** answered that the operation will use only the TIDH dump. However, most of the time OP will operate mainly with single bunches. In case they would have MDs with higher intensity, RP arranged with OP that they would do these MDs at the very beginning of this MD period (14th – 28th Nov).

For the PSB and PS, after the meeting, the following information was sent by **R. Froeschl**: *For the PSB, 3 MD cycles per super-cycle is fine, including the discussed MTE MD with only one ring (i.e. 500 1E10 p/cycle) that goes to the PSB dump. For the PS, The 4 hour long PS MD is fine for RP until Nov 28 in the morning; otherwise the same restrictions as for the PSB apply.*

4. AOB

The maintenance of the door YEA02.PSR=352 from Wed. 09/11 08.30 AM to Fri. 11/11 17.00 PM was approved (Annex 12).

B. Mikulec said that the "GSM network fault" was now available in the elogbook – thanks to **S. Pasinelli**.

Next Meeting: Tuesday 15th November 2016.

Minutes reported by JB. Lallement on 10th November.

Summary of the 39th FOM Meeting

Held on Tuesday 15th Nov 2016

Agenda (https://indico.cern.ch/event/587887)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule updates*
4. *AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.
There are 2 open actions (Annex 1),

1. There was no update concerning the document of procedures for WS settings for the injectors. The action stays open.
2. Concerning the ISOLDE interlock monitoring of the intensity, there will be an update in 1-2 weeks time. The action stays open.

2. Status of the machines

Linac2

R. Wegner reported the status of the Linac2 (Annex 2). Availability was 80.5%.
The issues:

- Nov 8 pre-driver amplifier RFQ tank 2 fault, exchange took 90 minutes.
- Nov 9 three consecutive issues taking 36 hours to fix:
  - RFQ Tuner 1 broken due to a thread of the rod that completely wore out. As a temporary fix it was blocked in the nominal position and Tuner 2 is used to keep the cavity on resonance.
  - RFQ's connector of 1kV trigger cable broke.
  - Memory corruption of HV modulator PLC, the program had to be re-loaded.

Currently Linac2 is stopped for radiation cool-down before the RP survey.
The source is steady.
A complete list of actions needed to be performed during EYETS to minimize the risk of failures until LS2 is in preparation and will be presented at the IEFC.

Q. from R.Scrivens: Is it already decided that Tuner 1 will not be repaired and the current configuration will be maintained until the end of the run?
A.: For the moment it can stay like this. There is a possibility to fix it by adding to the piston an extra piece with thread, but there is a risk that it will snap and in such a case it could penetrate inside the RFQ volume, what would need substantial time to repair.
Q. from R. Scrivens: The decision is already taken or is it still waiting for additional input?
A.: We can take this decision at any moment, if needed. In the current situation it is fully operational. Although the tuning range is larger for Tuner 2, in case of a longer stop and a larger detuning a local restart might be needed.

PSB

G. P. Di Giovanni presented the status of the PS Booster for **E. Benedetto** (Annex 3).
Apart from the problems in Linac2, a very quiet week for the PSB, smoothly producing OP and MD beams. Small issue with the LA1.QDN09 quadrupole (Linac2) that needed more time than usual for the reset.
Towards the end of the week, work on LHC-100ns to equalize the different PSB ring performances and to improve the already good (<10%) stability, after the increase in intensity from 6e10 to 8e10 ppb requested on Wednesday.
A lot of MDs took place, i.e. hollow bunches, tail repopulation, wire scanners/SEM grid studies, tests on the new turn-by-turn pickup measurement system, in addition to checks without beam on the B-train reference magnet. The MD program will continue until November 28.

ISOLDE

E. Matli reported the status of ISOLDE (Annex 4).
Minimal took data with 66Ni all week until the target broke Saturday afternoon ending the physics run a bit earlier than expected. Target failure was expected and a backup target was prepared on HRS and set up during the week. It was not possible to set up all the machine with the new target during the week end, and instead during Sunday the beam was used to make a collection of 66Ga for calibration purposes.

ISOLDE Users

K. Johnston: Very smooth run with Miniball which was studying Ni-66 in a modified setup. On Sunday a calibration source of Ga-66 was made and then the newly commissioned VITO beamline took Na beams until the end of protons on Monday morning. This was for asymmetry tests and they went extremely well.

PS

H. Damerau reported the status of the PS (Annex 5).
Quiet week. Availability of 78% for protons. Ion beams were delivered during the Linac2 fault.
Issues:

- Nov 9: Cooling water of extraction dumper power converter (20 minutes).
- Nov 10: Un-resettable fault of C10-46 cavity, C10-11 spare did not start (35 minutes).

- Nov 14: Short-circuit in final tube of cavity C10-96 amplifier (1 hour).

Triple splitting still needs to be improved for the ion beams.
Trying to reach 1e13 intensity, but not yet there.

East Area

B. Rae: Very good week.

East Area Users

H. Wilkens: Very happy users, despite L2 managed to complete the program. Big thanks for the good year and in particular to the PS team.

nToF

D. Macina: It was an excellent year for nToF.

AD

L. Joergensen reported on the AD status (Annex 6).
Very good week, very little down-time. Had only a few problems:

- Nov 8: During DSO tests for ELENA the AD injection line tripped and BHZ6045 took more than one hour to restart.
- Nov 10: 4 times radiation alarm in the AD hall with no AD beam. It was induced by PS to SPS beam losses in the TT2 transfer line. The levels in the TT2 tunnel were within the limits.
  Comment from H. Vincke: Apparently some parameters, either in AD or in TT2, need to be adapted.
  Comment from T. Eriksson: This is a quite recently installed monitor.
  H. Vincke: To be followed up.
  R. Steerenberg: It was installed during LS1, and a lot of tests were done with provoked losses in TT2. This monitor never triggered; it was eventually another one that always reached the alarm level first.
- Nov 10: The scrapers lost their reference position.
- Nov 13: Quads-mains down for half an hour.

Yesterday started the ELENA commissioning.

AD Users

H. Wilkens: On November 11 the 5 trapped antiprotons had their 1st anniversary.

SPS

D. Manglunki reported the status of the SPS (Annex 6).
Not a fantastic week, availability of 70% for fixed target beams.
On November 9 the MPS tripped first at 16:30 and resetting it took 30 minutes. It tripped again at 17:00 and it was not possible to reset SMD10. The EPC specialist was not available and the EPC

standby replaced SMD10 by the spare, SMD14. At 18:00 the MD was over and the machine switched to physics. It took one hour to get the vacuum piquet back to unblock the fast valves. Once the fixed target cycle was reinstated, the beam was lost at injection. After readjusting the tune over the flat bottom it was found that the problem was due to the spare power supply (SMD14) not following the reference current. It was removed and SMD10 put back in the configuration, which allowed delivering the fixed target beam.
On November 10 a trip of MST and MSE caused the full fixed target beam (2e13) to be dumped at high energy. This caused the vacuum at the level of the TIDVG dump to rise just above the set threshold of 2.7e-7 Torr. Even after waiting 3 hours, during the night it was not possible to put the fixed target beam back, as each time the remaining 3% of the beam was dumped, the pressure rose above the interlock threshold. On Friday morning the interlock threshold was raised to 3e-7 Torr, to allow producing the low intensity LHC beams (both p and Pb). Due to spurious temperature spikes on the dump, it was feared that there was a cooling failure, so an inspection with a camera-equipped robot took place in the afternoon. No water leak was found, confirming that one of the temperature probes was faulty. At the end of the day it was decided, in agreement with the EN/STI and vacuum specialists, to raise the vacuum interlock threshold to 4e-7 Torr.
For the LHC proton beam, 200ns batch spacing is at the limit of what can be done, as the last bunch of the 1st batch sees already the raising kicker and the last bunch of the 2nd batch does not receive the full kick. This results in extra losses for these bunches and their lower intensity. As one of these bunches is non-colliding in the LHC, it may be possible to change the filling pattern, using 300ns batch spacing for the protons. This is being followed up with the damper team.

North Area

B. Rae: Very good week, big thanks to the SPS.

North Area Users

H. Wilkens: Despite the stop of beams to investigate the spike on the TIDVG vacuum, the test beam users could complete their program in time for the stop of SPS proton fixed target physics this Monday morning. The last 4 days were also very important for the NA62 experiment, as it was finally operated at intensities close to nominal, the results collected will be instrumental in refining the intensity request for the 2017 run, especially since the QF ripples and 30Hz have now disappeared.
Looking back at the SPS proton fixed target run 2016, it has been a very good year for the testbeam users. For the COMPASS experiment the limitation imposed after the appearance of the vacuum leak on the TIDVG have had a significant impact it received about 4.3E18 protons on target, i.e. 72% of what was delivered for 2015, whereas the requested intensity was ~20% higher as in 2015. The situation for NA62 is somewhat different as the first one third of run they ran at very low intensity while ironing out problems on the trigger and DAQ. Later the intensity was increased to 25% then 30% of nominal.
All the NA proton users address a big thank for the SPS and technical groups for operating and maintaining the SPS and NA experimental halls as well as possible.

HiRadMat

No report.

AWAKE

B. Rae: Finished beam commissioning on Friday. Resume beam commissioning with the plasma cell in 2 weeks (28th of November).

LHC

R. Steerenberg: Difficult recovery from the detector stop. A generator of the dump kicker was exchanged during the stop. There was a special run with 200 bunches colliding only in ALICE. Had one fill above 37 hours, what is a new record. Afterwards running with 200 bunches colliding also in other experiments. On Saturday the beam orbits were ringing for 4 h after the earthquake in New Zealand.

Linac3

R. Wegner: Linac 3 was running very nicely past week. Good intensity between 37 and 40 mA. Today started the oven refill.

LEIR

S. Jensen reported for LEIR (Annex 7). The availability was 100%.

- Nov 10: Transverse damper down, and alarms not shown in LASER led to 1h45 without beam - fortunately while there was no beam request from LHC.
- Nov 11: The alarms issue was efficiently fixed, tested with simulated errors. A test with real errors will be scheduled on occasion (requires machine access).
- The NOMINAL beam was optimized longitudinally yielding 9e10 charges extracted.

PS Ions

H. Damerau: LHC_ION_Early_PB54 and ILHC100#4b beams delivered.

SPS Ions

D. Manglunki: For Primary Fixed Target the DSO tests passed all OK, but the extra EPC functionality (tripping MSE/MST and chain 9 in case the reference exceeds a current value defined by an EPC specialist) does not work at the lowest momenta. Started Primary FT ion cycle preparation with beam.
The LHC nominal beam is very good. The spread in intensity is largely reduced compared to the previous year. The emittances are larger, but within the specs.
Question from B. Mikulec: Is the machine considered safe, concerning the tests that failed?
A.: Yes. The Safety Unit did not require this extra functionality. It was added by EPC as an extra precaution at the moment of defining the project, and is therefore included in the specifications, but is not essential to guarantee safety. **F. Pirotte** confirmed.

Q. from S. Hancock: The proton bunch intensity jitter seems to be well above 20%, while PSB reported earlier today a 7% stability. Do you know where in the chain it is spoiled?
A.: No, I don't. Would be good to check this.

CTF3

No report.

TI

J. Nielsen reported for TI (Annex 8).

- Nov 10: SPS BA2 cooling circuit tripped. Seems to be an interlock from the vacuum system.
- Nov 11: NA62 cooling fault for the Gigatracker loops 1-2-3; similar to the one on Nov 1. It is due to a radiation sensitive flow meter. The detector cooling experts are looking for a radiation resistant replacement.

V. Kain asked if EN-CV could find in the meantime the reason why demineralized water is disappearing in BA2. **J. Nielsen** answered that it was checked and no leak was found yet.

R. Scrivens reported that at the TIOC the requirements for Linac2 source tests during the lab closure was discussed. No showstoppers were found, but EN-EL need to come back (to TIOC) with tests that are foreseen in this period.
J. Nielsen: I would be happy to know who organizes the global coordination for all EYETS.
R. Steerenberg: It is discussed during the PS EYETS coordination meetings, every Thursday between 11:00 and 12:00. EN-EL reports there.
J. Nielsen: But there is no one who really coordinates it globally, right?
R Stereenberg said that all grey areas in the coordination should be identified and followed up with **M. Bernardini**.
R. Scrivens concluded he should make sure the EYETS PS co-ordination meeting is well aware, and any potential issues should be brought up there.

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule.
The beams were stopped on Monday Nov 14 at 6AM for the radiation survey, following the end of the high intensity proton run. Beams should back today around 5PM.
Next week the UA9 run will take place.
After the RP survey the proton-lead for the LHC will continue and primary lead for NA experiments, as well as proton beams for AD and AWAKE. Limited proton MDs as lined out in the minutes of the last FOM can still take place in the injectors.

Comment from H. Bartosik: Concerning the dedicated MDs on Nov 16:

- SPS will use the LHC ion cycles, but will keep the Fixed Target cycle in the sequence so that the setting up of the experimental beam lines to the targets can continue.

- In the PS there will be an MD on the KFA45 injection kicker to test the short-circuited mode, which will result in minor perturbations for the AD beam in the beginning and at the end of the MD.

In the following FOM an analysis of the faults for the overall 2016 proton run will be presented by all the machines of the proton injection chain.

The last FOM will take place on December 6.

Comment from T. Eriksson: ELENA will be in commissioning during week 50. I would like to assure that all the services are available during that time.
Q. from H. Vincke: What beam will you be using?
A.: A H- beam from the local 100 keV source.

4. AOB

D. Chapuis requests to put the access point YEA01.LN2=363 in maintenance from 8:30 Nov 16 until 17:00 Nov 18 (Annex 9).
The request was approved.

Next Meeting on November 22.

Minutes reported by P.K. Skowronski on November 16.

Summary of the 40th FOM Meeting

Held on Tuesday 22nd November 2016

Agenda (https://indico.cern.ch/event/589227/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *2016 fault analysis - Linac2, PSB & PS*
4. *Schedule Updates*
5. *AOB*

1. Follow-up of the last FOM

V. Kain chaired the meeting.

The list of presence can be found in Annex 0.

The minutes of the 39th FOM are approved.

There was no update on the two open actions (Annex 1).

2. Status of the machines

Linac2 – Linac3

D. Kuchler reported the status of the Linacs (Annex 2).

The Linac2 had a very good week with 100% availability. Intensity variation along the beam pulse were observed, as only low intensity beams are now produced. This entailed some troubles for the LHC beam production that were solved by the PSB operation which modified some timings.

The Linac3 had an availability of 99.5% last week. The source ovens were refilled on Tuesday during the RP survey and it took only 10 hours from stop to restart.

Given the UA9 run and in order not to restart during the week-end with the energy change, **D. Manglunki** proposed to postpone the next source refill on Monday next week instead of Friday this week. **H. Wilkens** said this move had a positive impact on the NA users. There was no objection to this proposal.

The Linac3 source refill will take place on Monday (28/11). If compatible with LHC filling schedule, the source will be stopped at 6.00 AM.

PSB

K. Hanke presented the status of the PS Booster (Annex 3).

It was a very quiet week with only few users (LHC, AD and MDs) and an availability of 99.4%. The main downtimes were due to the slow kickers trips (BE.BSW14L4 – 15L1) at the beginning of the week and to the electrical glitch on Sunday evening.

LEIR

D. Manglunki reported on the LEIR status (Annex 4).

It was a very good week for LEIR. EARLY beams were produced for NA and LHC pilot, NOMINAL beams for LHC physics. Yesterday evening, 2 hours downtime were due to some tests on the Linac3 that unexpectedly modified the beam steering. Fortunately, this was not during LHC filling.

PS (protons and ions)

I. Efthymiopoulos reported the status of the PS (Annex 5).

It was a very good week with 98.7% availability for both proton and ion beams. Main downtime was due to intermittent faults on RF cavities (solved by resets and switch to spare). Beam intensity is now limited by the radio-protection group.

AD

P. Freyermuth reported the status of the AD (Annex 6).

It was a pretty good week with only minor problems, especially at the restart after the RP survey (e-coller and RF). Changes in beam steering are observed after every restart. The cause is not understood yet**. K. Hanke** pointed out that the CPS Tuesday' stop should be removed from the statistics as fault.

T. Eriksson added that the ELENA commissioning was progressing very well. Last week, an H- beam at 100 keV went through over 3 turns.

AD Users

H. Wilkens said there was nothing special to report.

SPS (protons and ions)

F. Velotti reported the status of the SPS (Annex 7).

It was also a very good week with 95% availability (97% for NA ions). Main downtimes were due to a MCIAV.88117 power converter fault, few trips of the mains (still under investigation) and MKD trigger missing from time to time (not fixed yet). The problem with the low intensity/large H emittance of the last bunch of the first batch and the first bunch of the last batch was solved. It was due to the SPS damper not working because of the too low intensity (threshold was changed).

D. Manglunki added that the interlock issue that occurred during the DSO test was understood. The problem was due to the relatively high bending current interlock limit on the magnetic septa combined with incorrectly low current settings. The bend limit will have to be further reduced, but no as low as was initially though. This will be further discussed with the EPC team.

North Area

B. Rae reported it was a good week for the North Area. The beam was restarted on Wednesday and the setting up went pretty well.

North Area Users

H. Wilkens said that the NA61 reported very good data taking over the last week.

HiRadMat

There was no report.

AWAKE

There was no report.

LHC

R. Steerenberg reported the good progress over the week-end with the energy switch to 6.5Z TeV. The machine was affected by the electric glitch on Sunday evening and the beam was back yesterday evening. They were currently running with proton-lead physics before going to lead-proton during the next week-end.

D. Manglunki pointed out that, thanks to the beam quality in the injectors, the peak luminosity is 6 times higher than expected. **R. Sterrenberg** confirmed that they achieved 40 nb^{-1} in 4 fills and that the goal of 70 nb^{-1} should be reached despite the last days problems.

CTF3

F. Tecker reported the status of CTF3.

It was a good week with pretty successful beam loading experiment over the week-end (until the glitch).

TI

J. Nielsen reported the events of last week (Annex 8).

On Sunday evening, at 22.37, a weasel created a short circuit in the Harmonic filter park SEF2 causing an 18 kV failure at point2 and CV alarms throughout CERN. Beams were lost in the PS, SPS and LHC.

The 18 kV was restored 2 hours later at point2. The SVC restart was successfully completed at 10.15 on Monday morning. As this becomes kind of a recurrent fault, studies are on-going to find mitigation.

3. 2016 proton run fault analysis

Linac2

D. Kuchler presented the Linac2 fault analysis for 2016 (Annex 9).

In 2016, the Linac was operated for a period of more than 6000 hours. This is 500 hours more than the average operation duration over the 15 last years. The availability was 97.3%. The lower availability in comparison with the last 15 years (98.3%) could be explained by the longer operation duration period with less relative time for technical stops usually used for preventive maintenance.

The total downtime was 166 hours and is mainly attributed to 3 causes: The source, the RF system and external perturbations.

The proton source caused 73 hour downtime, and its performance degraded over a long period. It is explained by two virtual vacuum leaks, that were difficult to detect; two cathode exchanges (one preventive in the shadow of a technical stop); and the time needed to diagnose the faults. A spare source is in preparation and will be tested at the end of the year.

The RF system caused 57 hour downtime with few major faults over the run (ignitron, HT cable broken, RFQ tuner, reference amplifier…) The RF team is analysing the situation and is looking whether preventive maintenance could be done.

External perturbations (power glitches, water station…) caused 24 hours downtime.

Remaining downtime (11 hours) was due to several minor faults that were not recurrent and for which nothing could really be done preventatively.

PSB

K. Hanke presented the PSB fault analysis for 2016 (Annex 10).

Over 2016, the PSB availability was 93.9%, and the main downtime were due to the Linac2 availability, the PSB RF, faults on kickers and septa and power.

As already presented by **D. Kuchler**, the Linac2 suffered from few major faults over 2016 and degraded source performances for a long period. The source and RF experts are very few and intervene on best effort.

The PSB high level RF system is ageing and caused 67 hour downtime. It will be fully replaced during the LS2. In general, the PSB RF system will be consolidated in the LIU framework.

Kickers and septa faults caused up to 60 hour downtime. They are one of the main downtime contributors because of the 4 PSB rings. Their restart is often a problem after technical stops. The injection will be completely exchanged at the Linac4 connection. The extraction and recombination systems will be exchanged/renovated during the LS2.

Some of the power converters are often difficult to restart after the technical stops. They should be identified and investigate whether consolidation is possible. The MPS and number of other converters will be replaced during the LS2.

External fault are contributing to 32 hour downtime. Linac2 and PSB RF as well as some power converters are always affected. Sometimes, the machine restart takes much longer time than the electrical fault duration itself. Optimized recovery from power cuts and technical stops should be investigated.

M. Hourican said that the faults on the septa usually takes longer time to solve because of their location in highly activated area and need a long cooldown time before the intervention can even start. One of the main reason for the septa faults was identified to be due to faulty electro valves. They will all be replaced during the EYETS and one could expect better reliability for the next run.

J. Nielsen confirmed they are very often the same equipment causing problems at restarts after power cuts. He added that some equipment to measure perturbation could be put in place on devices identified as the most sensible.

PSB

R. Steerenberg presented the PS fault analysis for 2016 (Annex 11).

The availability of the PS was 88% over 2016 however is can be quite different from user to user (95% for LHC ions – 92% for SFTPRO – 88% for East Area). Giving clear statistics is not so easy from the elogbook as it is difficult to know what beams were requested at the time of a fault. The main downtime this year were due to the MPS fire (150 hours), Linac2 and PSB availability (70 and 90 hours), POPS (trips and incident – 58 hours) and RF system (50 hours).

The main fault occurred on the 27th April, when a POPS capacitor bank was short-circuited. The PS returned on the rotating machine 1 day later until the 20th May, when a power switch burned in the MPS. The machine then returned on the POPS (in degraded mode) after 6 day downtime.

The extraction of faults for different users is very long. A detailed example was presented for nTOF where POPS faults were clearly identified as main contributor for 2016.

Downtime statistics should be improved with weekly checks of entries in the logbook as well as entry based on LSA context and not timing users. A new Accelerator Fault Tracking system will be deployed in 2017.

2016 was in the end a pretty good year. The nTOF committed integrated intensity was delivered. Without the POPS and MPS faults, availability would have reached 93.7%.

V. Kain added that beside the main POPS incident, there were also frequent trips. **R. Steerenberg** answered that 80% of the downtime attributed to POPS is due to one fault. The remaining 20% are explained by the fact that any time POPS trips, it discharges through a resistor and it takes 10 minutes for the resistor to cool down during which POPS cannot be restarted. One of the solution to limit the impact could be to cool-down the resistor with a cooling system.

4. Schedule updates

V. Kain presented the injector schedule v 2.1 (Annex 12).

The UA9 will start on Wednesday at 11.00. MDs will take place in the PS in the shadow of UA9.

D. Manglunki added that the setting up for the NA at different energy will start after the UA9, on Thursday at 08.00AM and reminded that the Linac3 source refill is now scheduled on Monday.

5. AOB

There was no AOB.

Next Meeting: Tuesday 29th November 2016.

Minutes reported by JB. Lallement on 24th November.

Summary of the 41st FOM Meeting

Held on Tuesday 29th November 2016

Agenda (https://indico.cern.ch/event/591006/)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *2016 fault analysis - SPS*
4. *Schedule Updates*
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 40th FOM are approved.

There were two open actions (Annex 1).

E. Fadakis gave an update on the issue concerning the surveillance and the management of current/targets/intensities in the ISOLDE interlock system (Annex 2). A new "context aware" application is proposed where a distinction is made between timing user and LSA user. The possibility of adding an interlock in the SIS taking into account the last current transformer before each target is being evaluated. The ISOLDE and PSB teams will discuss the possibility of providing more control on beam characteristics to the ISOLDE operation.

B. Mikulec said that there are still a few points to be discussed before the final implementation. Nevertheless she proposed to close the action, as the new application will be available for the 2017 restart.

The action was closed.

2. Status of the machines

Linac2 – Linac3

M. O'Neil reported the status of the linacs (Annex 3).

It was a very good week for Linac2 with a 100% availability. Some source parameters were adjusted on Friday in order to improve the stability and the ZERO cycle pulse length was increased. The pulse length on ZERO will be decreased in the afternoon to reduce the dump activation and the PSB operation will monitor at every shift the impact on the stability.

It was also a very good week for Linac3 with 98.9% availability. The source ovens were refilled yesterday. The only downtime (2 hours) was due to some tests of an application for emittance measurements that unexpectedly steered the beam at the end of the linac (already mentioned at the last FOM).

PSB

B. Mikulec presented the status of the PS Booster (Annex 4).

It was a good week with 95.9% availability. The main downtime was due to a fault on the ring4 distributor (BI4.DIS10). The thyratron had to be replaced and its glass envelope broke after the exchange, which made the intervention pretty long and difficult. The ring2 horizontal emittance measurement performances are degraded (to be followed up). In addition to beam production for the AD and the LHC, there were many last minute MDs.

Concerning the beam characteristics allowed by RP for the MDs until the end of the run, **H. Vincke** will contact **R. Froeschl** who will give an update to the PSB and PS teams.

LEIR

M. E. Angoletta reported on the LEIR status (Annex 5).

It was an excellent week with 100% availability. EARLY and NOMINAL beams were produced with typically more than 8.5e10 extracted charges on NOMINAL. In parallel to normal operation, an intense MD program took place. In particular studies to ascertain the effectiveness of modulating the frequency at capture to obtain a more repeatable intensity out of LEIR, without sacrificing the intensity. The synchronisation at extraction was optimised on NOMINAL and EARLY, profiting from additional features in the new LEIR LLRF, developed in 2015 for the intense PSB beams. This allows eliminating dipolar structures in the extracted beam as well as obtaining an unprecedented jitter-free position of bunches arriving to the PS.

PS (protons and ions)

A. Guerrero reported on the PS status (Annex 6).

A very good week with an availability of 94%. The PS delivered operational beams and many MD beams all along the week. The RP limitations were not clear enough for the agreed MDs. In some cases the intensity and frequency did not match the PSB and PS restrictions. Two accesses were needed to fix some issues on the C40-77 cavity causing a proton down-time of 2 hours. A timing error on the KFA71 kicker stopped the beam during 30 mins. In the shadow of the scheduled stop for the PFWs dedicated MD on Wednesday, an intervention on the PS water cooling system took place to fix a problem with a malfunctioning pump. The Wednesday afternoon dedicated MD was delayed by 3h waiting for the SPS to go into coast. The MTE beam was played successfully and measurements taken. The EAST ion beam was successfully extracted to the EAST line dump with a spill of 400 ms and is ready to be delivered to IRRAD for tests.

AD

L. Bojtar reported the status of the AD (Annex 7).

It was a very good week with no major fault worth mentioning.

T. Eriksson added that, last week, a 100 keV H^- beam circulated in ELENA for a couple of ms. Unfortunately, a source transformer insulator broke on Friday and the commissioning is now in standby. It might take a few weeks before a new transformer is received.

AD Users

H. Wilkens said that the users were happy.

SPS (protons and ions)

V. Kain reported the status of the SPS (Annex 8).

It was a good week for the SPS with 94.6 % availability and the successful energy switch for the NA ion beams. The main downtimes were due to the PS RF, unauthorised trimming of a vertical corrector in ITH of LINAC3 via a script, frequent trips of the main power supplies and 3 h of downtime were due to a disk problem of the SPS post mortem server, which blocked all frontends in the SPS sending data to it.

The UA9 ion run took place from Wednesday 11.00 AM to Thursday 8.00 AM. It was followed by the switch of the extraction energy for the North Area ion run from 33 GeV to 76 GeV proton equivalent. The proton and ions for the LHC occasionally suffered from quality issues this week. The 100 ns proton beams had to be equalised with the help of PSB operation at several occasions and the last ion bunches were very often unstable at transition crossing during one of the fills on Wednesday. Unfortunately the degraded ion beam had not been stopped by the BQM. Since then the BQM settings have been adjusted to avoid injecting bad beam in the future.

D. Manglunki added that, yesterday evening, an intervention of the STI piquet was delayed because the BA2 access door had been locked by the CSA group due to some work going on in the area (but no-one was aware of works in BA2). **J. Nielsen** said that this will be followed up by TI.

North Area

B. Rae reported that the energy change setting-up went very smoothly.

North Area Users

H. Wilkens said that the NA61 experiment collected more than 3 million events at previous energy. Since the energy switch, they noticed some beam instability.

AWAKE

E. Gschwendtner said that AWAKE aims to take the beam from Saturday evening.

LHC

M. Lamont reported on the successful change of circulating beam direction. The LHC now operates in lead-proton. The crystal collimation MD was taking place. The LHC will be stopped on Monday at 6.00 AM.

CTF3

There was no report.

TI

J. Nielsen said it was a very quiet week. There was nothing special to report.

3. SPS 2016 proton run fault analysis

V. Kain presented the SPS fault analysis for 2016 (Annex 9).

The SPS had an overall availability of 76.2% in 2016. The weakness in injectors statistics, as already pointed out last week in the PS report, is that they do not directly reflect on beam availability, as the super-cycle is adjusted depending on the machine status. As an example, the LHC filling time is always rescheduled in case of an SPS failure and the LHC operational beam availability is therefore shown as 100%. North Area beams being always present in the super-cycle, their statistics give a good overview of the SPS availability.

In 2016, the SPS had quite frequently weekly availability above 90% with a median at 85.1%. Most of the 2016 downtime was due to the availability of the injectors (contributing to 37% of the total downtime), to the issue with the TIDVG (31%) and to power convertors faults (10%). The longest faults that occurred during the year were:

- Fault of the MPS in May – 149 hours
- TIDVG vacuum leak in April – 148 hours
- Fault on the MBE.2103 18kV cable in October – 49 hours
- Linac2 RFQ tuner and DTL HT cable in November – 31 hours
- PS internal dump vacuum leak in August – 30 hours
- 517 wire scanner stuck in beam aperture in September – 21 hours

There were no systematic issues impacting on downtime, but several one-off problems caused long stops and degraded performances. 2016 was not a great year in terms of performance, but this is not reflected in the statistics. The new AFT should distinguish faults and degraded operation in order to provide more consistent statistics.

4. Schedule updates

B. Mikulec presented the injector schedule v 2.1 (Annex 12).

A dedicated MD is scheduled in the SPS on Wednesday (no beam for the NA). Next week, there will be a dedicated MD for coast with protons. The LHC will stop at 6.00 AM on Monday. AWAKE is taking the beam from Saturday. The next week's FOM will be the last for 2016.

5. AOB

There was no AOB.

Next Meeting: Tuesday 6th December 2016.

Minutes reported by JB. Lallement on 1st December.

Summary of the 42nd FOM Meeting

Held on Tuesday 6th Dec 2016

Agenda (https://indico.cern.ch/event/592384)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule updates*
4. *AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in Annex.

1. Follow-up of the last FOM

The minutes of the last FOM were approved.

2. Status of the machines

Linac2 and Linac3

R. Scrivens reported the status of the Linacs (Annex 2).
Very few problems in Linac2, availability 99.9%. There were 2 RFQ trips on Sunday that were successfully reset by the PSB operator (9 minutes of downtime). The source intensity is declining, but it is sufficient for LHC and AD beams. Test with the new source will start on Monday at noon.

Linac3 was much more eventful than Linac2.

- After oven refill (that was delayed due to LHC fill) the source did not start as expected due to control system issues.
- On Wednesday the stripper foil was exchanged, after instabilities were observed at LEIR injection. Worked perfectly well and afterwards record intensity out of LEIR was achieved. The foil needs to be changed every month, while until now it was done every 2 months.
- On Friday morning Tank3 became unstable and internal cavity had to be changed leading to 1h 40 min downtime. The instability was developing over several days, was erratic and difficult to find.
- On Monday the source tripped and the restart took 40 min.

Q. from J. Ferreira: When the source tripped the vacuum had risen at the source, but it dropped afterwards as if the valve was closed. Was it a vacuum-related problem?
A.: No, it was not a vacuum problem. It is a normal situation in case of a HV breakdown in the source: the spark creates a pressure rise at the source and after the beam is stopped there is no beam-induced effect downstream, so the vacuum level improves again.

PSB

J. Sanchez Alvarez presented the status of the PS Booster (Annex 3). Excellent week with 99.9% availability. The only significant down time (50min) was on Tuesday for the AD beam when the C04 cavity of Ring 3 needed an expert intervention. Fluctuations for the LHC beams were below 4%.

LEIR

J. Axensalva reported for LEIR (Annex 4). It was a very good week and the downtime was due to the Linac3 problems. Milestone of 1e11 charges was reached thanks to RF adjustments both in the longitudinal and transverse plane.

Comment by B. Mikulec: Linac 3 and LEIR demonstrated an excellent performance this year with a few records, a considerable improvement compared to the previous years. Congratulations to all the teams involved.

Comment from J. Nielsen: I don't think that the GSM network can be held guilty of LEIR downtime.
A. by D. Manglunki: It is right that it was not the cause of the problem, however, it contributed to the machine downtime because the expert could not be reached to fix the problem. In this particular case, at 5AM we finally had to call an expert who was not on call.

PS

F. Tecker reported the status of the PS (Annex 5). The PS had an excellent week with smooth running. Most of the beams had been stopped before, and the remaining operational beams were AD, low intensity protons (2.1E10 p/b) for the LHC p-Pb run, and ions for the LHC and North Area physics. Low intensity proton beam was also used for several MDs.
The uptime for protons was 99%, for ions 93% due to the change of the ion source on Monday. The only other bigger problems were one hour lost due to a problem with the F16.QFO215 power converter, and 45 minutes for AD due to a wire scanner blocked while the LHC was not taking beam.
Amongst other MDs, a beam with integer tunes of 7 in both planes was commissioned at low energy and various optics measurements were performed.

Comment from R. Scrivens: Stop for refilling the source is not a downtime, it is treated like a planned technical stop.

AD

B. Dupuy reported on the AD status (Annex 6)**.** Availability was 97.3%. Most of the problems happened on Thursday.

- Energy variation at 100 MeV/c, which was cured by electron-cooler cathode adjustment (20 min.)
- Electrical glitch caused the extraction kicker, DR.QUAD and TRIM power-supplies to trip (30 min.)
- Extraction kicker DE.KFA50 stopped. The specialist intervened, but it turned out that it was inhibited by the user interlock system (40 min.)
- Malfunctioning cryo-head and compressor (stochastic-cooler pickup 31) provoked the vacuum pressure raise in sector 29-31, what in turn made the beam energy unstable (5h 30 min.)
- On Monday DR.BHZTR20.21 started oscillating between maximum and minimum and First Line had to intervene (1h 45 min).

AD will run for one more week until Monday noon.

Comment from T. Eriksson: After the stop AD will keep running for some time without beam for testing interlock system.
Q. by H. Damerau: Do you need to RF system operational? There are works foreseen immediately after the beam stop.
A.: Not needed.

AD Users

H. Wilkens: The run has been very good until now. Big thanks to operators and all the involved people. I hope it stays like this for another 5 days.

SPS

D. Manglunki reported the status of the SPS (Annex 7).

- Tuesday 29/11 in the evening it was tried to fill the LHC with the new LEIR beam (AMDRF instead of NOMINAL). This beam uses RF frequency modulation prepared by Simon Albright to dilute the longitudinal density and decrease the space-charge detuning at capture. The performance of the LHCION beam was indeed improved and it was decided to keep that beam as operational. Unfortunately, the more intense beam (>5.1e11 charges at extraction) unmasked the LSS6 BPM errors, which prevented the LHC filling. It was then decided to go back to the standard, weaker beam to fill the LHC during the night. The correct BPM settings were only set the following day. During the night the ion beam from LEIR was fluctuating without any visible cause.
- Wednesday 30/11 was programmed a dedicated ion MD from 08:00 to 18:00, to compare the behaviour of ion bunches under fixed harmonic and fixed frequency RF on the SPS flat bottom, so the North Area was powered off during that period. Perfect timing, as at 13:00 the fire brigade asked to turn off the 18kV in BA80 because barrels of phosphoric acid (pH

0.2) had been found leaking and threatening to explode. 18kV was restored at 14:15 and the North Area was powered again at 17:00 in anticipation for the post-MD restart. In the afternoon at 16:00 the SMD10, repaired by EPC, was put back in the mains configuration. In the evening the LHC could be filled for the first time with the upgraded LEIR beam. Shortly before midnight a physicist from the North Area dropped an access key to his zone door (138) and could not find it. Again during the night there were lots of bad ion shots, and the cause could not be identified.

- Thursday 1/12 SMQD tripped three times between 0:00 and 1:00, so eventually it had to be put out of the configuration and replaced by QS. At 1:00 the key to door 138 was eventually retrieved by the OP team with the help of the SBA physicist who had to crawl under the concrete blocks.
  At 10:00 QD was repaired and put back in the configuration so as to have a working spare before the weekend.
- Friday 2/12, from 3:00 onwards the ion beam intensity started to deteriorate more and more, until it became useless. At 8:30, the reason of the instabilities of the ion intensity, which had been observed during the previous days, could eventually be traced to a faulty RF tube in Linac3. A temporary fix was quickly put in place, and an intervention was planned for later that day. As the LHC lost its beams it was decided to advance the intervention, and to have the SPS RF power team also intervene, as they needed to change a filament. This latter intervention lasted longer than anticipated, as the new filament broke and they had to put back the old one. In the meantime the PS extraction septum (PR.SMH16) tripped for one hour, so the LHC could not have been filled properly anyway. The LHC was eventually filled between 12:45 and 14:00.
- Saturday 3/12 during the first LHC filling, there were a few missed injections on the ions because of saturated BQM due to the high intensity. The PPM attenuator was reduced by 1dB (to -12dB) for the following fill.
- Sunday 4/12 at 2:00 there was a - fortunately spurious - fire alarm in BA3. This is not the first time this happens; the RF team is aware there is a problem with the fire detection in TRX3. At 7:00 the new filling scheme was prepared (p+ in beam 1, Pb82+ ions in beam 2) to fill the LHC for the last time this year. The LHC was finished filling at 9:30. The subsequent 1h ion beam downtime due to the Linac3 source only affected the North Area.
- Monday 5/12 at 8:00 the fixed target ion beam at 30AGeV/c has been stopped for setting up of the one at 150AGeV/c (380ZGeV/c). The bends had to be precisely limited to 390GeV/c for the LOKN.
- This week AWAKE is supposed to start taking the beam, but the beam permit has to be re-established.

North Area

B. Rae: For the North Area it was a good week. We had some problems tuning the beam with the new energy on Monday night.

North Area Users

H. Wilkens: There are several users using the FT ion beams. Until now the ion run is very successful.

HiRadMat

Answering to a question of **V. Kain**, **B. Rae** said that HiRadMat will ask for beam on Thursday. He confirmed that this concerns a multi-bunch beam for a few shots. **H. Damerau** mentioned that this beam will have to be prepared in all machines, therefore it concerns more than a few shots.
R. Froeschl said that he would look into this. The beam request detailing precisely the beam parameters has to be sent as soon as possible to the different machine supervisors.

AWAKE

S. Gessner: AWAKE took beam during last week and will take more just before the end of the run.

LHC

M. Lamont presented a summary for the LHC run (Appendix 8). There were some major problems

- Martens penetrating HV equipment provoking short circuits and its failures
- PS main power supply
- Vacuum leaks in the SPS beam dump that limited the intensity to 96 bunches per injection and 2220 benches per beam (cf. 2750).

Luminosity was increasing throughout the run thanks to smaller beta stars, BCMS beam and reduced crossing angles at the end reaching 1.5e34 $cm^{-1}s^{-1}$ what is 50% larger than the design value. The integrated luminosity was also well above the target for all experiments. Overall availability was 49%.
Injector faults are the main cause of downtime (312h).
Also the p-Pb run was very successful: Luminosity was 6 times higher the design value and ion intensities 3 times higher.

CTF3

No report.

TI

J. Nielsen: There was only one electrical glitch on Thursday afternoon to report.

3. Schedule Updates

B. Mikulec presented the latest version of the injector schedule.

There will be a few more MDs this week, limited to LHCINDIV-type single bunch beams with an average supercycle occurrence of 1 per 10 cycles.
Comment from H. Bartosik: A dedicated MD will take place on Wednesday Dec 7 8:00-18:00:

- No beam for North Area, no impact on the rest of the complex

- Short test with ion beams in the morning
- Coast with LHCINDIV from 10:00 - 18:00

From Friday Dec 9 18:00 all MD beams have to be stopped (except for ion beams).

RP recommend 3h of cool-down before the RP survey on Monday Dec 12, which is scheduled at 8:00. Therefore, the proton beams shall be stopped at 5:00 and ion beams at 6:00.

Comment from R. Scrivens: On Monday and Tuesday Linac3 will run source tests with beam at source energy.

Q. by L.Soby: When will PSB access be granted?
A. B. Mikulec: Please contact D. Hay, who coordinates the EYETS activities.

Comment from J. Nielsen: TI operators will be working all the time through the end of the year closure, in case of any problems don't hesitate to contact them. They will also have some spare SIM cards in case someone needs to change it over the lab closure period.

Next meeting will take place on March 21 2017 with the aim to present machine readiness reports.

4. AOB

A. Bland announced that the passwords for operational accounts will be changed on January 11 and communicated before to the coordinators.

Next Meeting: 21st of March 2017.

Minutes reported by P.K. Skowronski on 8th of December.