



Summary of the 1st FOM Meeting

Held on Tuesday 21st March 2017

Agenda (<https://indico.cern.ch/event/623750>)

- 1. Linac2 and Linac3 shutdown activities and analysis*
- 2. PSB shutdown activities and analysis*
- 3. FOM membership list*
- 4. Schedule*
- 5. AOB*

B. Mikulec chaired the meeting.

The list of presence can be found in [Annex 1](#).

1. Welcome and general news

There will be no meeting next week. During the machine restart period meetings will be held every 2 weeks.

2. Linac2 and Linac3 shutdown activities and analysis

C. Mastrostefano presented shutdown activities and the machine status for Linac2 and Linac3 ([Annex 2](#)).

For Linac2 the E0 line was removed and a larger aperture vacuum chamber was put in place of LT.BHZ25. Both interventions went OK.

Complete maintenance of the cooling system for Tanks and RFQ, which is performed every 3 years, also went as planned.

A new source, which is reconstructed from the old one, was installed. It had to be re-assembled because it developed issues during initial tests in January, most probably due to an elastomer joint. It works fine since 15 Feb. The old one is kept as a spare.

Question from **B. Mikulec**: What is the delivered beam current?

Answer from **R. Scrivens**: 250 mA at the moment. Compared with the old one, at 250 mA this one has more gas content and less arc current. There is eventually potential for extracting more current.



Five transformers were replaced.

After the incident in 2016 with a broken piston in the RFQ all the tuner pistons and vacuum pumps on the RFQ were replaced, while the ones on Buncher 1-2 were checked OK. Within RF maintenance four amplifier tubes were replaced.

Motor for demineralized water pump was changed and variable-frequency drive was replaced with a new type, as the previous one was inducing unwanted fluctuations.

New power converter LT.BHZ20 was installed, however, the associated cabling was not done due to lack of manpower during EYETS.

One week was lost for installations due to delayed DMR procedure.

On February 15 there was a water leak in section 2 of tank 1. It flooded the linac. It was dried out with help of the fire brigade. However, the vacuum level is still worse now compared to the prior situation.

Question from B. Mikulec: Was there any alarm transferred to TI?

Answer: There was one, but there was a confusion in interpreting the readouts.

Comment from B. Mikulec: We need to follow this up, because the linac accelerating tanks are very sensitive to temperature fluctuations, so we cannot afford such incidents.

Comment from J. Nielsen: There was a general alarm on the cooling system of Linac2 at 19h50, which was investigated by a TI operator. There were 2 notes of electricity disconnection in this area, therefore it was concluded that it was the reason for stopping the water station. Following a detailed verification, it was found that station FTEF-00216 should not be affected. At 21h TI operator intervened in place. The first conclusion was that the station works correctly. It was found that sole alarm is on low coolant temperature. The 3-way valve that is used for the temperature regulation was at its maximum and therefore was not capable to regulate more. The facts that the power was cut before, the machine was off and low water temperature indicated too low heat charge. At 23h16 nothing abnormal was found, the water station was still working and the temperature was not changing since the beginning of the intervention. The piquet was contacted to inform him about the situation. Having the situation described and in agreement with TI the piquet judged that his intervention would not bring anything new. It's necessary to note that

1. There is no remote supervision for this installation so it is not possible to perform any real diagnostic on the historic values.
2. There are only 2 possible alarms on this station: general fault (high level) and station stop (low level)



3. The web page <http://scrivens.web.cern.ch/scrivens/Linac2/linac2surv.html> that previously was showing the temperatures now shows only the Vistar pages.

The actions that were defined by TIOC in the follow-up of the incident:

- The responsible of the equipment is advised to configure an automatic alarm (assigned to **D. Kuchler**)
- An additional alarm “number of refills is too frequent” will be added (assigned to **S. Deleval**)
- The instructions of *helpalarm TI* will be modified (assigned to **R. Ledru**)
- A responsible person for shut-down periods will be defined and communicated to TI (assigned to **D. Kuchler**)
- The origin of the leak was not found and will not be found (assigned to **S. Deleval**)
- Leak alarm available locally is requested and all alarms have been updated according to instructions from Linac2 super intendants (assigned to **J. Nielsen**)

Linac2 restart commenced on March 10

- Hardware permit signed.
- Quadrupole TANK is on.
- Completed tests of BENDING magnet current limit interlocks.
- LT BHZ 20 restarted and now locked by the DSO (EIS SWY).
- EPC restarted all power converters.
- March 16 DSO tests done, LI STP 1-2 locked by the DSO.

If beam permit is signed then the beam will be sent to L2 dump on March 23 and to PSB on April 10.

Linac3 underwent a normal maintenance (mainly vacuum equipment, RF and source). Additionally

- Two ITF SEM grids were modified.
- A pepper pot also is supposed to be modified, however, it was not yet done and there is no news on this item. A query was sent, but no answer until now.
- Airflow around vacuum control racks was modified.
- Operation of the source started on February 24.

The works had to be interrupted due to electric network maintenance (2d) and controls maintenance (0.5d). For the next year, could it be put forward before the start-up?

Answer by **M. Gourber-Pace**: This time it could not be avoided because security patches had to be installed in 2 steps.



Answer by **A. Bland**: It also needs to be negotiated with IT-DB. We try to fit as much as possible before the startup in order not to disturb, and in this case we could not avoid it.

Comment from **R. Scrivens**: For the machines operating from January, a 3h stop should not be a problem.

Question from **C. Mastrostefano** for **TI**: What is the way to find out if eventual electric perturbations are finished and we could commence hardware restart? At the moment we are in blind and it often happens that secondary cuts occur while hardware is already being restarted. There is a web service, but we are strongly discouraged to use it. The telephone number 72201 is giving an automatic message and not connecting to the TI operator.

Answer by J. Nielsen: If you call TCR at 72201 there is indeed an automatic voice message. However, after it is finished, a connection is made with an operator from whom you could get the information about the status. This was implemented to reduce the amount of incoming calls from all the affected users after an important power cut. And indeed it does the job to discourage users with minor requests.

PSB shutdown activities and analysis

D. Hay presented the shutdown activities in the PSB and the machine status ([Annex 3](#)). The works took 11.5 weeks and included:

- Preventative and Corrective Maintenance.
- Removal of obsolete cables (De-cabling Project)
- Cable installation for LIU and consolidation.
- Anticipation from LS2 of LIU Project activities.
- Consolidations and Upgrade installations.

One of the ERD electric distribution boxes was split into 2 ERDs.

In anticipation for LS2 BI.BVT10 racks were installed. All LIU cables were installed and 4432 old cables were removed. Cabling campaign was very successful.

Also within the LIU project the following items were successfully completed:

- Installation of 4 new BR.TMD monitors (8L1) Transformer interMeDiate.
- New prototype wire Scanner BWS (4L1) PSB-BWSRA-EC-0001 installed.
- Installation new kicker KSW (16L1) PSB-MKKSUW-EC-0001.
- Relocation of monitor BTV (BT.BTV30) PSB-LJ-EC-0003.
- Installation of new wideband pick-up on BTP line PSB-BPUWB-EC-0001.
- Enlargement of the shaft (BHZ10) PSB-K-EC-0003.
- Exchange of extraction septum SMH (15L1).
- Installation of new BLMs (FIC detectors) PSB-BLM-EC-0002.
- Installation of new ring Trajectory Measurement System electronics.



- Renovation of electronics for 4 BR.BCTDC (section 9).

The only item that was postponed to YETS 2017-2018 was the installation of 4 new tune pickups in 3L1 PSB-BPMTA-EC-0001. Installation of switchboard is delayed and is still ongoing. Alcove works are on schedule.

Comment from **B. Mikulec**: Concerning the status, there were 2 weeks delay due to the switchboard installation, and now there is a big on-going effort to catch up with the schedule, but it cannot be confirmed yet if the beam would start on time. Cables still must be checked to see if any more accidental cuts/damage occurred. It will be better defined in a week's time.

Comment from **B. Mikulec**: I would like to ask all the hardware groups who start the tests to carefully verify the status of the concerned installations and the zones to avoid any incidents by all means.

3. FOM Membership

B. Mikulec presented the current lists of FOM members ([Annex 4](#)) and machine supervisors ([Annex 5](#)). She asked to verify them and to inform **S. Dubourg** if any name should be added or removed.

4. Schedules

B. Mikulec presented the 2017 schedule for the injectors ([Annex 6](#)) and for the LHC ([Annex 7](#)). She noted that:

- PS will be closed on Apr 1.
- SPS is closing this week (Week 12).
- Recommissioning with beam will happen over the Easter weekend for PSB and PS.
- ISOLDE is scheduled to start their physics run April 24.
- The same day (April 24) beam shall be sent to SPS and its recommissioning with beam will start.
- On May 1 the commissioning of the LHC with beam as well as physics in EA, nTOF and AD will start.

Technical Stops:

1. The first TS is only for the injectors on June 30 and will take 24h.
2. The second Injector Technical stop (ITS2) is on July 6 and it is combined with a COLDEX run and the LHC TS1 from July 3 to 7. It will take 36h.



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3. ITS3 (36h) is on September 21 and it is combined with COLDEX and UA9 runs. The same week LHC TS2 will be from September 18 to 22.

The ion run will start in November, this year with Xenon. The NA physics run with protons will stop on October 23. High intensity proton physics (ISOLDE, nTOF, EA) will finish on November 20. End of the 2017 run is scheduled for December 18.

5. AOB

There will be two presentations in the FOM in 2 week's time:

1. PS shutdown activities and analysis by **S. Mataguez**.
2. SPS shutdown activities and analysis, presenter to be defined.

Next Meeting: 4th of April.

Minutes reported by P.K. Skowronski on 23rd of March.



Summary of the 2nd FOM Meeting

Held on Tuesday 4th April 2017

Agenda (<https://indico.cern.ch/event/626051/>)

- 1. Follow-up of the last FOM*
- 2. Linac2 start up status*
- 3. PS shutdown activities and analysis*
- 4. SPS shutdown activities and analysis*
- 5. Schedule update*
- 6. 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 1st FOM](#) were approved.

2. Linac2 start up status.

R. Scrivens reported on the Linac2 startup ([Annex 1](#)).

All tests were completed and the beam successfully sent to the dump. The start-up was slowed down because of the unavailability of the watchdog until last Friday (as the LT.BHZ20 was not powered). Actions were taken in order to avoid repeating in the future the two “CCC hiccups” (the source arc current is now limited by the source team and the Linac2 power supply controls are now in a separate working set from the PSB ones; this was a special working set with all power supplies used for repowering after a technical stop).

Small bumps in the cavity tank temperature entail movement of the tanks that do not return to the same position. This induces an increase in the vacuum level. Some of these vacuum spikes are enough to trigger the interlock (even if the cooling water temperature changes are within normal range). The Linac operation and vacuum teams met last week and took actions that will be followed up.

The 50 MeV beam will be ready to be sent to the PSB on Monday next week.

R. Scrivens gave more details on the issue that occurred with the LT.BHZ20 lock-out. In previous years an isolating switch between this power converter and the magnet was locked out, allowing acquisition to be returned by the Power Converter controls to the beam interlocks and the Linac2 SIS watchdog, confirming zero current and therefore the beam dump as destination. Without these information this year, the interlocks and watchdog had to be bypassed, and the beam surveyed



manually – reducing reliability testing. Since 31 March it was agreed to return the lock-out to the isolating switch. For 2018 it is foreseen to use a new power converter, installed in a new location. EPC are informed of all these points and in principle will power the converter controls independently to overcome these problems – in any case they will provide a solution. **B. Mikulec** asked **C. Mugnier** to confirm that the BIS for Linac4 would not suffer from the same issues when it is used post LS2.

B. Mikulec said that POPS should be ready in the afternoon in degraded mode and therefore the DSO test could take place for the switchyard, PS ring and TT2. **F. Pirotte** will keep the Linac2 team updated with the DSO test status.

3. PS shutdown activities and analysis.

S. Mataguez reported on the PS shutdown activities ([Annex 2](#)).

A complete report is given in the EDMS document 1771646.

Main objectives and motivations for the EYETS PS activities were:

- Preventive and corrective maintenance
- Identification of obsolete cables (de-cabling project)
- Cable installation for LIU and consolidation
- Consolidations and upgrade installations

Activity details and highlights were given.

Overall, the shutdown went pretty well and all activities are now complete.

In order to make the material access easier, a double-door entrance will be implemented at the next YETS. The straight section vacuum chamber height should be measured (**K. Hanke** will get in contact with the survey team). The TREC system is fine, but the processing of radioactive waste is still a bit slow. The concrete floor of the PS ring interior side is slowly degrading (60 years old) and a long-term solution should be discussed with SMB. A reorganisation of the 151-R is needed in order to give more space to the magnet workshop and unloading area.

B. Mikulec reminded that the changes on the PS machine should be updated in the layout database (to be followed-up by EN/ACE).

D. Manglunki acknowledged **Simon** for having organized PS visits during the EYETS that were very well received.

4. SPS shutdown activities and analysis.

A. Berjillos reported on the SPS shutdown activities on behalf of **D. Mcfarlane** ([Annex 3](#)).

Main objectives and motivations for the EYETS PS activities were:

- Preventive and corrective maintenance
- Identification and removal of obsolete cables (de-cabling project)
- Cables installation for the LIU and consolidation



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- Anticipation of LS2 LIU project activities
 - Consolidations and upgrade installations
 - Replacement of the damaged beam dump
 - Crab cavity infrastructure

The SPS EYETS was 13 weeks in total. A list of different activities was presented and details given on the critical tasks that were the replacement of the TIDVG, the decabling campaign and the crab cavity installation work.

All planned activities are now complete.

5. Schedule update.

B. Mikulec presented the injector schedule ([Annex 4](#)). The PSB will take the beam on Monday, the PS on the following week.

6. AOB

Technical infrastructure status

J. Nielsen reported on how the major power cuts are handled ([Annex 5](#)). In case of a major power cut, TI can receive up to 5000 different alarms and treat more than 100 phone calls per hour. In order to limit the impact of the phone calls and to give a better information to CERN staff, a pre-recorded message saying "A CERN-wide power cut is on-going, if your call is urgent please hold the line, otherwise call back later", will be activated on the TI answering machine. It should greatly help in sorting calls by priority.

On Monday afternoon at 17.50, a severe electric perturbation occurred on the 400 kV network (50% voltage drop for 40 ms). Many systems were affected (all recovered 2 hours later).

L. Jensen commented that it could be envisaged that a specific list of CERN staff would receive an SMS in case of a major perturbation. **J. Nielsen** will investigate this option.

Intervention électrique sur voie redondante du système d'accès.

D. Chapuis presented the intervention on access system ([Annex 6](#)). In order to complete the intervention, the zones in "beam mode" will be switched to "beam off" for 10 minutes today at 14.00. The Linac2, Linac4 and people concerned by the PS DSO tests were informed.

A. Bland informed that an intervention related to the firewall will take place on Wednesday afternoon, but should be transparent for the users.

D. Kuchler will discuss with RP the possibility of accelerating the Xe beam down the Linac3 next week.



Next Meeting: Tuesday 11th April 2016.

Minutes reported by [J.B. Lallement](#) on 6th April.



Summary of the 3rd FOM Meeting

Held on Tuesday 11th April 2017

Agenda (<https://indico.cern.ch/event/630554/>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. PSB HW commissioning summary and issues*
- 4. Schedule update*
- 5. AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The list of presence can be found in [Annex 0](#).

The [minutes of the 2nd FOM](#) were approved.

2. Status of the machines.

Linac2

D. Kuchler reported on the Linac2 status.

A vacuum leak developed on a DTL first tank post coupler during the night from Tuesday to Wednesday triggering the RF interlock. A cloche was successfully installed over the post coupler on Friday (secondary vacuum) and fixed the leak.

Another vacuum leak developed at the intersection of DTLs 1 and 2, at the same location where a water leak occurred few weeks ago. Some corrosion and trapped water were observed. A secondary pumping was prepared by the vacuum team and is ready for installation.

Apart from these two issues, the beam was successfully sent to the PSB yesterday noon.

J. Ferreira commented that the vacuum team would need few short accesses to implement the secondary vacuum on the intertank region. The first access would require a pre-warning of 2 hours.

Linac3

D. Kuchler reported on the Linac3 status.

MDs on LEBT measurements and TWTA tests took place last week in order to understand if one could get more beam current from the source. They were not very conclusive. The beam went down the



complete linac yesterday. The RP team was requested to proceed with a radiation survey in the Linac3 building with the Xenon beam.

3. PSB hardware commissioning summary and issues.

A. Akroh presented a summary of the PSB/ hardware commissioning ([Annex 1](#)).

The hardware commissioning lasted 3 weeks from the 20/03 to the 11/04. The DSO tests for HW permit were delayed by one week and took place on the 27/03. A new online checklist was created this year. Due to late PSB repowering, the OASIS commissioning was postponed by one week and the WIC commissioning by 10 days. Details on the activities that took place during the weeks 12, 13 and 14 were given. The decabling campaign went very well. For over 4332 removed cables only 32 were cut/removed/damaged by mistake.

In conclusion, the PSB HW commissioning is now completed and thanks to the good collaboration between the equipment teams, the delays were caught up. The beam was presently successfully injected into and accelerated/extracted in the PSB.

M. Gourber-Pace asked if the OASIS signals validation campaign was completed. **A. Akroh** answered positively.

B. Mikulec acknowledged once again the different equipment groups for their commitment and their prompt reaction that helped in resorbing delays.

4. Schedule update.

B. Mikulec presented the injector schedule ([Annex 2](#)).

The PS will take the beam on Monday (or even earlier). SPS first beam and the ISOLDE physics will start in two weeks.

5. AOB

There was no AOB.

Next Meeting: Tuesday 18th April 2016.

Minutes reported by [JB. Lallement](#) on 11th April.



Summary of the 4th FOM Meeting

Held on Tuesday 18th April 2017

Agenda (<https://indico.cern.ch/event/632087>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Report on ISOLDE / REX-TRAP / REX-IBIS start-up status*
- 4. Schedule updates*
- 5. AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in [Annex 1](#).

1. Follow-up of the last FOM

The minutes of the last FOM were approved.

2. Status of the machines

Linac2 & Linac3

G. Bellodi reported the status of the linacs.

Linac2 started delivering beam to the PSB on Monday 10th of April in the afternoon, after the Switchyard permit was signed.

There was 1h stop with machine access on Monday to pull a vacuum cable.

On Tuesday morning a RF intervention was needed on a faulty amplifier of the LI.CBU02 buncher cavity (50°).

On Wednesday afternoon, there was a planned intervention of the VSC team to install a secondary vacuum system at the Tank1 intersection to mitigate corrosion effects. This took 2 hours, though restart with beam was further delayed by a RF problem on the LT.CDB10 and 12 de-buncher cavities.

Studies of trajectory optimization at PSB injection were carried out during the week. BLMs were reconnected to monitor losses, but they will need further debugging with BI.



In Linac3 Xe22+ beam operation and further tuning was done. RP measurements were carried out that will allow sending the beam into the IH linac.

PSB

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

The PSB was restarted on April 10 at 13h without major problems. Ejection kickers tripped several times due to temperature, specialists are investigating.

Some connectors and cables were found broken. Affected devices: TFB, Wide band PU, radial PU. The TFB cables are already fixed. The BI cables will follow. The main concern was the commissioning of the new BTMS (Booster Trajectory Measurement System). The specialists managed to fix most of the problems and this allowed to do orbit corrections. Thanks to the BI team.

LHCINDIV and LHCPROBE beams are within specifications. The AD beam is nearly within specifications, but a final check of the RF specialist is needed. NORMGPS and TOF beams are being set up and their intensities are increasing.

Question from **D. Hay**: The broken cables were due to the de-cabling campaign or due to some other reason?

Answer by **A. Findlay**: It was either due to the PSB repowering or due to the transport of the BSW power supplies (in the case of the TFB racks).

PS

M. Fraser reported the status of the PS.

HW checkout tests were carried on throughout the week with many piquet interventions needed to get equipment up and running. EPC worked on POPS most afternoons and evenings around which access was organised. EPC also worked on the regulation of the figure-of-eight loop (W8L) and the PFWs, which is needed to compensate the inductive effects of POPS pulsing. This issue is on-going and caused problems for most of the week and over the weekend.

Polarity corrections were made and final polarity checks were completed in PSR and TT2. It was decided not to re-measure the polarity of PR.DHZ27 as it is in the Switchyard: if the beam shows an inversion for this element, it will be fixed during TS1. The checks showed the cable connected to XNO (newly installed for MTE) has an earth fault.

RF 10 MHz cavities (phasing) were readied during the week with the 200 MHz cavities (not needed for first beams over weekend) left in local before LLRF tests later next week.



The missing extraction timings/triggers were fixed on Thursday with new cables being laid by EN-EL on Thursday evening.

The DSO test for nTOF primary area was completed on Thursday afternoon, finishing with the beam permits for PSR and TT2 being signed before 19h.

A vacuum valve in the BTP line would not open, preventing injection and needed an intervention.

The PFW and W8L regulation faults made the acceleration of beam challenging. EPC worked on Friday and Saturday to find a solution so that the 10 GeV beam for the closed-orbit measurements could be set up. Despite this issue low intensity versions of MTE and TOF could be accelerated and put onto D3.

The W8L did not hold regularly for AD or LHCINDIV beams, but at different times over the weekend each beam made it to D3. Closed-orbit measurements using the 10 GeV cycle were made and a set of YASP corrections on the MU proposed: planned alignment intervention tomorrow morning, exact manipulations to be confirmed by ABP.

Comment by **B. Mikulec**: ISOLDE Sem-grid tests will be postponed to tomorrow afternoon due to the access for magnet alignment.

SPS

H. Bartosik reported the status of the SPS. Hardware tests are progressing well. New digital regulation of the main power supplies shows some issues, but these should be solved until Friday.

3. Report on ISOLDE / REX-TRAP / REX-IBIS start-up status

M. Lozano Benito gave the presentation ([Annex 4](#)). The start-up this year was much easier than the previous year. The beam was started almost right away.

In the following, the main winter activities were listed.

Vacuum system:

- Turbo-pumps greasing campaign.
- Moisture found in the primary vacuum system. Roughing pumps oil replaced.
- Vacuum connections crossed found at the RFQ pump. It was the most probable cause for the moisture in the system.
- Vacuum leak found and fixed at MSW10 sector.
- RA0 turbo-pump replaced.

BI:



- YCC0.BFC0900 faraday cup found connected to a different location.
- YRC0.BFC0160 faraday cup PAM replaced.
- Air compressed leaks found and fixed.

Works on the Front-End:

- Target water cooling leak found and fixed.
- Electro-valve replaced on extraction electrode due to its movement problems.
- Gas injection system of the ion source on the target refurbished. Leak detection done.
- PLC for the target water cooling crashed with un-acknowledgeable alarms.

Other works:

- Frontend (cfc-197-bisobeam) computer overheats due to dirty air intake filters. OK after filter replacement. This is a recurring situation after every shutdown period. **It would be good to envisage filter cleaning for all the computers in the zone during every winter shutdown.**
- HRS.TCS.SL2400 got stuck in close position. A mechanical part had to be repaired.
- GPS laser window with new flange design was installed.
- HRS90 separator magnet current reading was double of the real value. The origin of the problem was quickly determined and the element replaced.
- RFQ RF FESA class was updated to 64 bits.

DSO test was done on April 11 and since then ISOLDE is ready for protons.

Today evening the Sem-grid target should be ready for the beam to start setting up the BTY line.

The list of the activities in REXTRAP and EBIS:

- Beam emittance campaign continued during Jan and Feb.
- TRAP tested on the 03/02/2017 using the local ion source.
- Had to reload the PLC program on cfv-170-arextrap FEC.
- New EBIS cathode installed and conditioned 09/03/17.
- First beam from GPS injected into REX (TRAP+EBIS) the 30/03/2017.
- New cathode not performing well due to its displacement when heating and another cathode had to be installed on the 03/04/2017. Its bake-out will take 10 days.

Activities at HIE ISOLDE

- New cryo-module installed (number 3).
- All cryo-modules cooled down and RF conditioning done at normal temperature.
- RF works continue at the LINAC low energy part. Commissioning will start this week.
- New software for HIE ISOLDE beam diagnostics in development. Tests on going.

Question from B. Mikulec: When do you plan to start the first physics run this year?

A: Monday or Tuesday, if we can get stable beam from the target on Friday to do the steering.

Comment from B. Mikulec: It has to be seen whether this will be possible with the beam preparations, steering and Sem-grid target tests.



4. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

Tomorrow morning there will be access in the PS to perform the magnet alignment and some additional interventions.

Start of ISOLDE physics and first beam to the SPS is planned for Monday next week.

1st of May East Area AD, East Area and nToF physics will start as well as the LHC commissioning.

5. AOB

No AOBs.

Next Meeting: 25th of April.

Minutes reported by P.K. Skowronski on 19th of April.



Summary of the 5th FOM Meeting

Held on Tuesday 25th Apr 2017

Agenda (<https://indico.cern.ch/event/fom170425>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Summary and issues during PS HW commissioning*
- 4. Report on AD+ELENA shutdown activities and HW commissioning status*
- 5. Schedule updates*
- 6. AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in [Annex 1](#).

1. Follow-up of the last FOM

The minutes of the last meeting were approved.

2. Status of the machines

Linac2&3

M. O'Neil reported the status of the Linac2&3 ([Annex 2](#)).
Very good availability of Linac2: only one stop due to RF tank 1 and quadrupoles that had to be reset. RFQ amplifier feedback loop had to be adjusted to reduce beam intensity oscillations seen on longer beams. Probably next week there will be an intervention on Tank 1 secondary pumping system.

Linac3 setup is ongoing and it is going well. About 30 mA of Xe beam out of Linac. Next week an ion cycle will probably be requested.

PSB

B. Mikulec presented the status of the PS Booster on behalf of **A. Findlay** ([Annex 3](#)).

From now availability plots from AFT should be used. There are still some issues with the new AFT version for the injectors that shall be solved soon.



PSB had 88% of availability.

RF works still ongoing on R4 because of the observed longitudinal instability. BLMs BT.BLM10 & BTM.BLM10 still faulty and specialist intervention required at next beam stop.

MTE low intensity beam was provided within the specs. TOF beam is within the specs as of the last night and also BCMS25 and LHC25 could be used by the PS.

ISOLDE

E. Fadakis reported on the ISOLDE status ([Annex 4](#)).

The last week activities were centred on Sem-grid target tests: on Wednesday in HRS and on Friday early morning in GPS. On Friday at 20:00 delivered stable beam (40Ar). On Monday afternoon delivered first protons to the users on HRS (35Ar). The beams were delivered to the users in time corresponding to the schedule.

REX-LINAC: expert working on commissioning the amplifiers (7&9Gap).

HIE-LINAC: expert performing hardware commissioning of the cryo-modules.

ISOLDE Users

Friday evening switch to GPS

PS

M. Fraser reported on the status of the PS ([Annex 5](#)).

Availability was 50%. Solving issue with PFW and Figure-of-8 (W8L) circuits (described in more detail below) took 75 hours.

It has been a steady start for the PS with a low intensity MTE beam delivered to the SPS on Friday afternoon and over the weekend at approximately 350E10 ppp. LHCINDIV is also ready for the SPS and setting-up of the AD beam has continued with an intensity of approximately 1000E10 ppp sent to D3. The AD Target beam permit was signed on Friday.

The closed orbit of the machine was successfully corrected by displacing Main Units (MUs) 18 and 33 on Wednesday morning, reducing the rms orbit excursion from 2.1 to 1.3 mm. The start-up has been complicated by on-going issues with the calibration and regulation of the FGCs in the power converters for the PFW and Figure-of-8 (W8L) circuits of the MUs. Aside from regular trips needing resetting or piquet interventions, confusion was caused as the machine was restarted after Wednesday's realignment campaign when incorrect settings were synchronised to the FGC on



PR.WDW. As a result, the tune of the machine could not be controlled and splitting of the MTE beam became impossible. Beam-based investigations on Thursday pointed to an incorrect current being sent to the PFW, which was confirmed and corrected by TE-EPC experts on Friday morning. The calibration error amounted to a factor of 3/5, but this was not evident on the measured current provided by the FGC and available in the CCC; the PFWs appeared nominal despite this important calibration error and no DCCTs are presently available for these circuits. An intervention by a TE-EPC specialist is planned on Monday morning at 8:30 am to improve the stability and regulation of the PFW and W8L circuits and, as a consequence, beams to SPS and AD will be restricted until midday. Setting-up will continue on MTE and multi-bunch LHC beams as well as AD, EAST and TOF beams. There is chance it will be completed by the end of the week.

RF setup was delayed because of priority for ISOLDE beams in the PSB.

Comment from **B. Mikulec**: A meeting needs to be organized to work out a solution for all the machines concerning diagnostics of FGC currents. There were similar issues in the SPS this year and in the previous year.

Answer by **C. Mugnier**: These are new systems and any change in regulation requires full commissioning of the system.

Comment from **K. Cornelis**: Currently calibration for both Setting and Acquisition is done together at the same time so it's no surprise that the two always agree. An error in a dipole magnet might not be too difficult to diagnose, but if this happens for a quadrupole in a transfer line it can take a long time to identify the problem.

Comment from **V. Kain**: I think the problem is a missing cross-check to assure the correctness of calibrations.

Question from **K. Cornelis**: Did anything change in the procedure? It is in place for many years now and the problems started only after LS1.

Answer from **C. Mugnier**: For the SPS case this year a DCCT was changed.

Comment from **V. Kain**: Someone has changed something without telling us. There should be a procedure to follow in such cases.

Comment from **B. Mikulec**: We asked in the past for independent analogue signal measurements of the currents (OASIS), but this was refused.

Comment from **B. Mikulec**: We definitely need to find a solution for the now and for the future, as the FGCs will be deployed everywhere.

Question from **M. Gourber-Pace**: Is this problem in the PS understood and resolved by now?

Answer by **M. Fraser**: I believe yes. I think that persons doing the intervention did not know the procedure well.



AD

T. Eriksson said that the AD status would be covered by his presentation at point 4 of the agenda.

SPS

K. Cornelis reported on the status of the SPS ([Annex 6](#)).

Setting up with beam started last Friday afternoon. INDIV and FT (3e12) beams were accelerated.

The new beam dump behaves well. Graphite went up to 60 degrees with no vacuum activity. It means that the thermal contact is good and the heat is efficiently evacuated.

During the weekend BPMs were checked and they do not perform as good as desired. Probably a second iteration of setup is needed.

On Monday measurements for beam based alignment were done.

20% error in QF and QD calibration was found: both reference and current were 20% too low. Fortunately, the beam was flying well and only the orbit correction showed a problem with the optics.

A BLM had a bad contact, which was fixed with temporary measures. Today there will be a less temporary fix done.

3. Summary and issues during PS HW commissioning

D. Cotte gave the presentation ([Annex 7](#))

The assumed schedule of the hardware tests was followed. POPS tests were done in the afternoons therefore accesses were possible only in the mornings.

Encountered issues:

- On 4th April 6 cables for Oasis triggers were found cut what prohibited acquisition of the ejection signals. Quick reaction and fix from BE/CO: new cables were pulled and the system made operational on 13th of April.
- Vacuum leak on BTP.VVS20.
- Frequent trips of B8L and WFW.
- PFW tests were late because of access in the machine (safety) and regulation issues (new DCCT needs to be installed, which was requested already during the EYETS; described in length in PS report above).



- PR.XNO not ready (earth fault on DC cable).
- Missing B-Train during Dry Run.
- Lost BSF277 device in TT2 (OP was not aware that BI would remove this device).
- Several tests show up as failed in the checklist, however, all of them are not blocking ones.

Conclusions and comments:

- Polarity checks showed to be very useful: 34 out of 40 magnets were found inverted.
- The one week time given for Switchyard tests was too short
- Starting PS with beam on Easter Monday is not ideal. This is a French and Swiss school holiday period. Everything was therefore needed to be ok for beam on Thursday evening already for Monday. Of course the piquet teams were in place, however, in cases when the piquet needed a specialist help they were usually not reachable.

Question from **M. Gourber-Pace**: Why there was no B-Train?

A: I think this test was planned too soon and there was not enough time to prepare the B-Train.

Question from **B. Mikulec**: There were so many inversions, how could this happen? Is there no convention that is followed?

A: Inversions were on a patch panel in the middle between power converter and magnets.

Question from **B. Mikulec**: The convention used was the standard one?

A: Yes, the reference was a sheet from D. Bodard.

Comment by **B. Mikulec**: We should work out a procedure to minimize such problems.

R. Steerenberg: Thank you for the feedback concerning the schedule; we will take it into account for the 2018 planning.

4. Report on AD+ELENA shutdown activities and HW commissioning status

T. Eriksson gave the presentation ([Annex 8](#)).

The main point of the AD shutdown activities was the renovation of the magnets. Normally only bends needed repairs, but this year also the short QDN quads showed problems. One quad had to be repaired in situ because of difficult access and vacuum that was not broken in the sector.

The GBar experiment installed 1500 tons of shielding in direct vicinity of the AD machine. Complete survey in the vertical plane was done after several months and up to 0.5 mm offsets were found. Following a long discussion it was decided to postpone alignment since no orbit or acceptance measurements have been done yet. It is also expected that the floor will continue to sink for some more time.

During hardware tests the main issues were related to major modification of central timing for ELENA handling.



It took a long time (ADR: 7 days, ADT: 9 days from completion of DSO tests) to get the beam permit signed by all the parties. There was sometimes a 5h delay from signature to the automatic email informing about it.

Many issues during first beam setup: quite a lot of radiation alarms even though $\frac{1}{4}$ of nominal intensities. The beam in from the PS is not yet fully ready.

Comment from **M. Fraser**: Beam in the PS is ready, only some RF works are needed. It should be completed during the second part of this week.

Comment from **S. Hancock**: Already on Friday morning the beam was ready for AD, so what was happening during the weekend until now?

A: There were still several AD issues, very little could have been done during the weekend. Q: Was it only low intensity?

Comment from **S.Hancock**: No, it was beam with $900E10$ or even more.

ELENA installation work completed except:

- Electron cooler, installation foreseen July -17
- LNI/LNE; 2 L pickups & 2 SEM devices
- LNE50 (Gbar line) completion

A safety review of the Gbar experiment showed several issues with their electron linac.

The machine commissioning uses a local 100 keV H- ion source. This was repaired after the 2016 HV isolation transformer failure and was ready again on February 15. On February 17 an electrical failure in the source damaged many components. After lengthy repairs/modification restarted again on March 15 at 85keV. New problems on April 11: fast vacuum pressure rise when applying nominal filament current. Vacuum leak suspected: re-surfacing of components, re-brazing, re-sealing etc. with the help of CERN workshops was not conclusive. Expert from Julich provided a modified filament to run at lower current; initial observations look ok.

SEM device next to the source is not useful because it always displays signals on all the wires, probably because the H- beam is polluted.

First beam capture tests were quickly successful. Beam survives well until starting the acceleration ramp. Waiting for the tomoscope to become operational to do further optimizations.

Comment from **S.Hancock**: The tomoscope is ready, but there was only half a day of quality beam so there was not enough time to set it up.

Question from **B. Mikulec**: What are the milestones for ELENA?



A: Install the electron cooler in July. Gbar will ask for pbar beam some time during the year. There are many delays at Gbar and schedule changes, so it is difficult to determine an exact date.

5. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

1st of May several activities start

- LHC commissioning
- East Area physics
- nTOF physics
- AD physics

Question from **D. McFarlane**: The duration of TS1 in May is confirmed?

Answer by **R. Steerenberg**: It will be 24h from beam stop to beam start, so cool down needs to be included. This could change only in case there would be necessary vacuum interventions.

6. AOB

No AOB.

Next Meeting: 2nd of May.

Minutes reported by P.K. Skowronski on April 27.



Summary of the 6th FOM Meeting

Held on Tuesday 2nd May 2017

Agenda (<https://indico.cern.ch/event/635380/>)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *SPS HW commissioning summary*
4. *Schedule update*
5. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The list of presence can be found in [Annex 0](#).

The [minutes of the 5th FOM](#) were approved.

Addendum to last week FOM minutes:

An action was opened: Organise a discussion with all machines responsible to improve monitoring and/or procedures for FGC power converters (**C. Mugnier**). **C. Mugnier** said it was ongoing. **The action stays open.**

2. Status of the machines.

Linac2 & Linac3

R. Wegner reported the status of the linacs ([Annex 2](#)).

It was a very good week for Linac2 with no fault. On Wednesday the low level RF system for the RFQ amplifier was re-adjusted for longer beams.

Linac3 was running pretty well and currently producing a stable Xenon beam (~30 uA).

D. Manglunki commented that the last Linac3 current transformer (T41) shows a slightly degraded transmission. **R. Alemany** said this might be due to some steering settings that were adjusted last week.



LEIR

D. Manglunki reported on the LEIR status. The RF cavity 41 moved while baking out a vacuum chamber and cannot be reconnected to its amplifier. The RF, survey and vacuum teams will move the cavity carefully (ceramic chamber, no spare available) to make the connection possible.

PSB

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

During this week a lot of effort went into continuing beam preparation and trying to understand the longitudinal issues (high intensity in ring 2 blows up beam in ring 1 and longitudinal instability in ring 4 with high intensity).

The beams for the upcoming physics users are available within specifications (ToF, EAST, AD), as well as the requested LHC25 beam. ISOLDE has been taking first physics beam throughout the week.

Summary of findings concerning the RF problems:

Observation 1: R4 C04 has spikes from $\sim c750$ until extraction, often destroying the beam and causing losses; this happens also using the R0 beam control. **Workaround:** switch off the C04 "RF Act", which limits the intensity to $\sim 700E10$, shortening the bunch, but the beam is stable. An access of $\sim 2h$ is requested to disconnect, test and recalibrate the cavity.

Observation 2: the beam in R2 induces longitudinal blow-up of the beam in R1, most notable with high intensity beams, measurable as starting between $c600-c700$. An induced voltage in the R1 C02 (500 -600 V) is seen when its RF Act is OFF AND we have beam only in *R2*; the inverse is not true. There is a phase modulation visible on R1 C02 that is related to the intensity and radial position of the *R2* beam, this is thought to be what blows the R1 beam up; a change to last year's phase pickup didn't help. **Workaround:** radial steering in R1 to +9 mm during the cycle, which minimizes the blow-up, but more importantly minimizes the losses on the first BLM at extraction. It is also possible to greatly reduce the R1 blow-up by doing a -10 mm radial steering on R2, but we found the losses on the extraction BLM to be higher, despite the R1 beam blow-up being lower.

Answering a question from **D. Manglunki** on the second observation, **S. Albright** confirmed that the problem might be due to a damaged shielding of a cable.

ISOLDE

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

The first physics experiment of the year was completed on Friday morning (35Ar from HRS target to the VITO experimental station). The second physics experiment started on Friday evening and will continue until tomorrow (133In from GPS to the IDS experimental station). There was no major issue to report and the run went very smoothly over the week-end.

ISOLDE Users

K. Johnston said that on HRS 35Ar was taken to the VITO beamline in the first phase of an experiment, which aims to ultimately measure the quark mixing matrix element of 35Ar to a precision of 0.5%.



This first part of the experiment was more to do with establishing the technical aspects required for this measurement including the polarization of the beam and choice of implantation crystal. After a couple of difficult days a reasonable asymmetry was seen after implantation into NaF, although some more technical developments are needed.

On GPS the ISOLDE decay station has been measuring beta-delayed neutron emission from ^{133}In . This is quite a difficult beam to produce (only several hundred ions per second), but the run has been very smooth and the yields have been good. Excellent statistics on both the ground and isomeric state have been achieved and the experiment should complete its program by tomorrow.

PS

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

The PS had a busy week, with the preparation of many beams to be available by Monday May 1st. LHC 25ns 12 bunches, NTOF, AD (with new RF sources), and EAST for North branch and IRRAD+CHARM were prepared. Furthermore, MTE fixed target beam, LHCINDIV and LHCPROBE were sent to the SPS.

Beam permits were signed for EAST-North on Wednesday, EAST IRRAD+CHARM on Friday, and NTOF on Saturday.

The main downtimes were for the pole face winding control upgrade, a fix of NTOF water infiltrations and issues with the bending magnet F61.BHZ03 for EAST, the 10 MHz cavity C10-11 and an interlock on FTN.QDE480 (only affecting NTOF).

East Area

B. Rae said that beam was sent to T10 on Sunday and T9 yesterday. Everything looking good at the moment.

East Area Users

H. Wilkens said that the users were happy.

nToF Users

F. Mingrone said that they see only half the intensity they should on the BCT 468. **L. Jensen** took note and will follow this up.

AD - ELENA

T. Eriksson reported the status of the AD.

The first beam was sent on target Monday 24/4 at 15.00 and the first beam to physics was available on Monday 1/5 at 15.01, as planned. There were many issues during the week with Timing/Beam Request Server, C02 and C10 RF, BTV, kickers, power converters, BCCCA Cryo system, e-cooler trip etc...

Main relevant points were:



-
- RP alarms due to central timing modifications (resolved by BE/CO) and inj. kicker drop-outs.
 - Very good beam quality obtained Friday 27/4. $E_h/E_v < 0.5$ pi.mm.mrad, bunch length 120 ns, $3E7$ ejected thanks to both beam cooling systems working well from the start.
 - Phase change PS to AD observed Saturday, offset adjusted on the AD side.
 - New AD orbit system gives data, but it doesn't look correct. Info in the AD logbook.
 - Beam stopper operation in experimental areas problematic, being resolved today.

ELENA was restarted on last week in proton mode in order to make sure that the SEM grids work the same way with H⁻. They are presently commissioning the RF systems.

AD Users

H. Wilkens said that in spite of a very challenging planning, the users were happy that the physics started on Monday 1st, on schedule.

SPS

F. Velotti reported the status of the SPS ([Annex 6](#)).

The beam commissioning was started. The LHC PILOT beam was sent to the LHC on Saturday. LHC INDIV and FT cycle optimization were still ongoing (first NA beam on Wednesday). The main issues over the week were:

- Calibration problem in main PS translated in wrong current for both QF and QD of about 20%. Was debugged with beam.
- MKE6 problems blocked extraction for several hours.
- MSE6 cooling circuit problem, second time in less than a month. To be followed up closely.
- Current spikes on the main dipole currents observed (fixed by EPC).
- A regulation problem appeared on the QD circuit. A ~6 Hz modulation at the current range of SFTPRO at FB was also observed on the LHC INDIV (long) cycle (less severe).

The orbit excursion was reduced by 1 mm RMS on both LHC and FT beams by displacing 2 QFs and 2 QDs. The TIDVG4 commissioning is going pretty well. The vertical aperture machine study showed severe aperture restriction at 511 (confirmed by RP survey). The area will be checked with endoscopy during the next TS.

3. SPS hardware commissioning summary.

S. Cettour Cavé presented a summary of the SPS hardware commissioning ([Annex 7](#)), also on behalf of **J. Ridewood**.

The prerequisites checkout, SPS checkout and commissioning checkout schedules were presented. Overall, the SPS restart was spread over 8 weeks and the first MTE beam was successfully injected and accelerated into the SPS on the 21/04. First beam was sent to the LHC on Saturday.

The main issues that occurred during the restart were highlighted, especially the ones due to actions, upgrades, accesses or interventions that should not have been planned during the start-up and that



should be avoided (or better coordinated) next year. A better coordination of the TI2 and TI8 areas should be looked at between the SPS and LHC coordination.

In the end, the SPS was restarted 3 days ahead of schedule. **S. Cettour Cavé** concluded his presentation by acknowledging all experts and equipment groups for their collaboration and flexibility.

Concerning the TIDVG filter cartridge that was mounted in the wrong direction, **B. Mikulec** asked **S. Deval** whether a procedure existed. He answered positively, but it was unfortunately not followed in that case.

B. Mikulec and **R. Steerenberg** will take part in the injector HW commissioning offline analysis and especially look at the TI2 and TI8 coordination or sectorization changes proposed for next year.

Concerning the issue related to the CV intervention on the PFN MKE4, **S. Deval** sent the following mail after the meeting:

From: Serge Deval
Sent: Tuesday, May 02, 2017 1:46 PM
To: Stephane Cettour Cave <Stephane.Cettour.Cave@cern.ch>
Cc: Bettina Mikulec <Bettina.Mikulec@cern.ch>; Jani Lehtinen <Jani.Lehtinen@cern.ch>
Subject: Maintenance ventilation ECA4 - hardware test

Bonjour Stephane,

Faisant suite à la présentation de ce matin au FOM, je voulais t'apporter quelques informations complémentaires sur l'intervention pendant les hardware tests sur la ventilation dans la zone kicker en ECA4.

Nous avons fait une investigation pour comprendre ce qui n'avait pas fonctionné de notre côté. Il en ressort que :

- TE/ABT nous a donné la date pour l'intervention
- TE/ABT nous a consigné les installations côté Kicker (il n'y avait donc pas plus de risque)
- Une autre personne de TE/ABT (qui n'était pas au courant) a interrompu l'intervention et a envoyé le mail.

Bref je pense qu'il s'agit plus d'un problème de communication que d'un oubli ou un raté, nous planifions plusieurs centaines d'interventions pendant l'arrêt technique et nous sommes bien conscients que les HW tests ne peuvent en aucun cas permettre d'effectuer des interventions.

L'année prochaine ces interventions seront effectuées bien plus tôt pendant le YETS.

Cordialement.

Serge

4. Schedule update.

B. Mikulec presented the injector schedule ([Annex 8](#)).

D. Manglunki said that LEIR will start taking the beam next Monday. The DSO tests are scheduled for Thursday morning. From then, the passerelle will be closed until the RP survey.

Wednesdays' MDs are scheduled to start next week (to be confirmed by **H. Bartosik**).

It was decided to schedule the proton injector stop requested by the PSB and SPS **tomorrow (Wed. 03/05) from 9.00 AM to 11.00 AM**.



5. AOB

There was no AOB.

Next Meeting: Tuesday 9th May 2016.

Minutes reported by [JB. Lallement](#) on 4th May.



Summary of the 7th FOM Meeting

Held on Tuesday 9th May 2017

Agenda (<https://indico.cern.ch/event/637526/>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Schedule update*
- 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 6th FOM](#) were approved.

There was one open action ([Annex 1](#)).

1. No update concerning the monitoring of the FGC power converters. **The action stays open.**

2. Status of the machines.

Linac2 & Linac3

JB. Lallement reported the status of the linacs ([Annex 2](#)).

It was a very good week for the Linac2 with 100% availability.

The Linac3 was running pretty well and currently producing a stable Xenon beam (~30 uA).

D. Manglunki and **R. Alemany** commented that the Linac3 team requested the beam this morning to complete the debuncher cavity setup.

LEIR

R. Alemany reported on the LEIR status.

Everything is on schedule. EPC is following up the issue that occurred yesterday with a power supply.



PSB

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

It was a good week without major technical faults.

The Booster suffered still from RF problems in rings 1 and 4 which hampered also the setting up of high intensity. A broken feed-back was found on Wednesday morning. Its repair solved the ring4 issue. The ring1 issue persists...

The setting up continued with the MTE beam (1000E10 ppp will be requested by the SPS this week and are available; further ramping up intensity). The STAGISO beam setting up also started.

K. Johnston commented that there is no rush for the STAGISO beam. It will be needed in the coming weeks.

S. Albright commented that, following their investigations, the ring1 issue is most probably due to a problem with the high level and not the low level RF.

ISOLDE

E. Siesling reported the status of ISOLDE ([Annex 4](#)).

On the HRS side, the setting-up with stable beam from a new UC surface target started on Tuesday. The setting up through the ISCOOL buncher and cooler was difficult and new standard settings had to be found after repair and several changes within the ISCOOL during the shutdown. Wednesday-evening and night were used for RILIS laser optimisation and stable beam to the CRIS experiment. During the RILIS laser tuning it was discovered that the laser window in the HRS MAG90 separator magnet was dirty and the laser efficiency hence very low. An intervention was planned for Thursday to change the window. During the venting of the sector HRS20, the HRS10 (HRS Front-End) got unexpectedly also vented and it dropped the target and line heating. After discussion with vacuum team it was concluded that the valve between HRS 20 and 10 was leaking. This valve is on the Front-End side and can only be replaced with the entire front-end. Physics started right after window change and pumping and CRIS started taking beam in the evening. On Thursday evening the HT source broke and no beam could be extracted from the HRS target anymore. After the swap of the HT source from GPS the run could resume. As of Thursday-evening followed by the weekend the CRIS experiment has been taking radioactive Indium beam. The users are very satisfied.

On the GPS side, the radioactive run for IDS stopped on Wednesday-morning after a successful run. Some stability measurements were done on the GPS separator magnet 70 (no fluctuations found so far). The target change for a used target (#575) was foreseen on Friday however a few problems occurred: First the shutter would not give the closed ok signal on the previous target. It was recalibrated with the help of EN/STI after which the signals were ok. A huge leak occurred when trying to pump on the used (from last year) target 575 and pumping had to be stopped (probably due to the joint on the target cone). The target was exchanged for the previous one (595) to exclude a leak on the Front-End.

On HIE ISOLDE side, the beam commissioning at REX is advancing well. The beam passed the 7 Gap 2. Good progress and well on schedule. The installation work is completed and the hardware commissioning of the HEBT lines started yesterday.



B. Mikulec asked when the valve could be repaired. **E. Siesling** answered that the area being pretty hot, it cannot be repaired during the next technical stop. Situation will be evaluated during the next target change and the valve repair could be postponed to the end of the year or even to LS2.

ISOLDE Users

K. Johnston said that the decay station experiment finished their program on GPS last Wednesday morning, with excellent results from beta-delayed neutron emission of ^{133}In . The start-up for HRS was quite difficult but began on Thursday night and has been running fairly smoothly since then except for some interruptions due to the problems with the next GPS target. Laser spectroscopy, measuring quadrupole moments, charge radii etc - by the CRIS experiment on a series of In isotopes has been performed from ^{113}In to ^{132}In , almost all of which are new data. The users were quite satisfied with their run. The physics program for the next run on GPS has been altered due to the leaking target, and was being finalized at the moment.

All in all, not an easy week at ISOLDE, but the physics output has been still pretty good.

The STAGISO beam will be requested for the upcoming target test...

PS

H. Damerau reported the status of the PS ([Annex 5](#)).

I was a busy but pretty good week with 90% availability and the first week of physics of the 2017 run with beams from the PS. A basic setting-up of the 25 ns variant (up to 48 bunches) for SPS/HiRadMat has been prepared. Horizontal emittance blow-up at the end of the flat-bottom is still observed though and the origin is being investigated. Beams for the EAST hall experiments (including the parasitic bunch for TOF), the dedicated cycle for TOF ($\sim 7\text{E}12$ ppp) and the AD beam ($1.1\text{E}13$ ppp) were delivered as requested, as well as low-intensity MTE beam ($3\text{E}12$ ppp) for setting-up in the SPS. The latter has now been prepared up to $1\text{E}13$ ppp. A 4 h downtime was caused by intermittent missing pulses of the injection septum which seems not yet fully solved. Various technical issues in the PS, notably a polarity inversion of a horizontal corrector, have been attacked in the shadow of the two scheduled accesses in the PSB.

H. Damerau concluded by asking for a better coordination of the beam requests that was not the case over the previous week. **B. Mikulec** answered that this will be discussed between the FOM and the LHC operation.



East Area

B. Rae said there was no major issue to report.

East Area Users

H. Wilkens said that the irradiation facility will start very soon with samples. A neutrino platform experiment takes place in T9 and Alice experiment takes beam in T10.

nToF Users

There was no report.

AD - ELENA

T. Eriksson reported the status of the AD ([Annex 6](#)).

On Sunday, a failure on a PLC CPU blocked all the communication between the vacuum subsystems. The pumps went off and the pressure rose. The PLC was replaced by the vacuum piquet and 3 hours were needed to recover beam intensity. Last night, some condensation water coming from the B. 196 triggers the AD Target emergency exit door water leak sensor. The Fire brigade intervened to dry out the area and few hours were needed to let the sensor drying-out. The condensation water was probably coming from a missing hatch door on the ventilation (will be checked by CV). The thyatron of the ejection kicker was failing and should be replaced (3h interventions to be scheduled today at the user meeting).

AD Users

H. Wilkens said the users were very happy that the AD started on time.

SPS

V. Kain reported the status of the SPS ([Annex 7](#)).

The slow extraction setting-up started on Tuesday morning, but was only finished in the evening. Due to an issue of the knob->k hierarchy, accidentally introduced during the hardware tests, the extraction sextuple strengths were wrong by a factor 2. And this took a while to figure out.

During the night the beam was steered to the three North Area targets. In the following days the beam line physicists were setting up the lines behind the targets. Frequent stops for radiation cool down were required due to cooling issues of North Area magnets which needed access in TCC2.

On Wednesday EPC managed to resolve the problem of the QD 6 Hz oscillation of 50 mA amplitude. The damper setting was finished then and the intensity increased to $\sim 5 \times 10^{12}$ with two injections. The transmission with this intensity is $> 97\%$. The cycle still needs further optimisation. Every so often the beam becomes unstable in the vertical plane at around 1700 ms during acceleration. The damper has been verified, chromaticity and octupoles have been increased.

The first set of ZS alignment has also been carried out. The losses at the TPST - the mask in front of the MST - could be significantly reduced.



LHC INDIV beam was prepared and extracted successfully towards the LHC. 25 ns commissioning has started with 12 and finally 48 bunches on the HiRadMat cycle. The transverse damper has been set up. The quality of the 48 bunches from the SPS injectors is however not sufficient yet. The experts have not been able yet to re-establish last year's longitudinal quality. The bunches are too long at injection. The beam dump team has started the cross-check of the temperature evolution model and the MKE4 has had its first scrubbing after the LSS4 septa exchange this shutdown (and subsequent trip on vacuum interlock). The coast cycle required for the MD on Wednesday has been commissioned this weekend.

Many commissioning steps have been carried out as well during this week. The beam dump kicker waveform on the dump block was measured with the SEM grids, the active filter 50 Hz correction for the spill ripple was re-commissioned. Without the active correction on, the 50 Hz modulation is about 100 %. No 50 Hz bursts have been observed so far.

The 519 wire scanner is operational again. A timing cable had been disconnected.

H. Bartosik confirmed that the vertical instabilities had gone.

B. Mikulec asked where the cooling issue in the NA magnet circuits was coming from. **V. Kain** answered that at least in some cases it was due to valves that were not fully open. **V. Kain** will discuss with **L. Gatignon** to include these tests for the next year start-up.

North Area

B. Rae said that all the beam lines were under commissioning. There was still an issue with the collimator in H4.

3. Schedule update.

B. Mikulec presented the new injector schedule version 1.1 ([Annex 8](#)).

The MD blocks on week 20 and 21 were removed. The second LHC MD block will take place in week 30. UA9 was replaced by a scrubbing run on week 41 and moved to week 42.

Concerning the next injector TS (31st May), the impact activities should be sent as soon as possible to the machine coordinators. Next week, a first draft of the intervention lists will be presented.

4. AOB

There was no AOB.

Next Meeting: Tuesday 16th May 2016.

Minutes reported by [JB. Lallement](#) on 13th May.



Summary of the 8th FOM Meeting

Held on Tuesday 16th MAY 2017

Agenda (<https://indico.cern.ch/event/639234>)

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

V. Kain chaired the meeting.
The list of presence is in [Annex 1](#).

1. Follow-up of the last FOM

Minutes were approved.

2. Status of the machines

Linac2 & Linac3

D. Kuchler (for **G. Bellodi**) reported the status of the linacs ([Annex 2](#)).

Linac2 had a good week. On Monday afternoon an RF intervention was scheduled to replace RF tubes in the LT.CDB10 and CDB12 cavities, which had been found to be at the limit of failure in a routine inspection. The actual swap took about 1.5 hours, but some difficulties were later experienced in the retuning of the cavities until the original settings were found and restored. Operational conditions were recovered after about 4h from the start of the intervention (at 20h).

Less than an hour after that, a problem with the start/stop timings of LT.BCT20 triggered the watchdog to cut the beam. The problem was correctly spotted by the PSB operator and fixed by the BI specialist (40 minutes downtime).

The rest of the week saw smooth operation.



Linac3 officially handed over beam to LEIR for start of their commissioning last Monday. The de-bunching cavity could be finally set up after ion beam measurements in the LBS line were made possible again (after fixing some diagnostics and controls problems). There were suspicions that that beam was not according to the specs (energy, charge). For that reason a retuning of the beam at the exit of the IH linac (lowering beam energy and re-centering the beam in the ITF transfer line) were carried out to optimize the conditions for injection and beam circulation in LEIR. The current delivered to LEIR was thus improved by 3-4 uA (32 uA average on BCT41).

LEIR

D. Manglunki reported the status ([Annex 3](#))

Power supplies issues are mostly solved

- EI.BHN1020: an interlock cable had not been plugged in and resulted in a magnet fault; it took 2 weeks to be resolved
- The issue of ITE.BHN30 tripping frequently is not understood yet.

The energy of the beam from Linac3 is 1.5% lower than nominal. This had also been the case for argon and lead ions.

RF commissioning was carried out on Thursday and Friday. Energy matching is still to be done with the PS.

First extraction was performed on Friday

- RP measurements are scheduled for tomorrow (Wednesday)
- Could deliver beam to PS earlier than foreseen (before May 29 while it was originally scheduled for June 12)

Cycle clean-up is ongoing.

Comment **H. Demarau**: There are RF modifications to be done in the PS during the technical stop necessary for ion acceleration.

Answer from **D. Manglunki**: What can be done in the PS nevertheless without implying the RF:

- Preparation of magnetic cycle
- Test of injection elements (bump 26 , septum 26, kicker 28)
- Sublimation



PSB

J.-F. Comblin reported the status of the PS Booster for **V. Forte** ([Annex 3](#)).

Smooth operation with few blocking faults and various warnings (mainly CO-related). Machine availability was 98%.

Few interventions on RF during beginning of the week:

- R1-2 crosstalk seems to be cured (to be followed up this week).
- Some changes required in C02-C04 relative phase GFAs due to delays after change of RF cables (to be followed up this week for beams captured in double RF).

STAGISO is available for ISOLDE requests.

Tuning of high intensity MTE was performed in the second part of the week.

- Emittance in R4 was reduced mainly by adapting injection steering, tunes and multipolar resonance correctors.
- MTE Cycle taken on Saturday by PS at 1600e10 p total intensity.
- Possible to arrive to 2000e10 p for MTE, but emittances need to be further reduced: R3 has very large emittances, probably related to bad tunes. Ring 4 is also still not within the specs.

MD beams prepared for:

- 160 MeV tune shift vs. intensity study at different chromaticities.
- Tune measurements.

Next week the main priority is to check and/or set up the beams for the LHC

Question from **V. Kain**: What was the reason for the crosstalk between R1 and R2?

Answer by **S. Albright**: The reason is not clear, and it is possible that the problem is still there (although at the moment no evidence can be seen of it).

The best explanation I know of is that the BR1.C02 drive cable was starting to age and the earth connection was not perfect, which was replaced. There were also other replacements made in the HLRF, but these were less likely to be the cause. Since several things were changed relatively close together, I cannot be sure the drive cable is the explanation, but that is the most likely one.

Obviously, the exact cause cannot be verified, but it currently appears to be cured and the drive cable is the most likely culprit. I will be doing some more work to confirm this in the near future.

ISOLDE

E. Matli reported the status of ISOLDE

HRS:

CRIS took beam until Thursday morning without major issues.

GPS:

Target #595 was reinstalled last week after a failed attempt with #575 that was leaking. Setting up was straightforward as the target was already used on GPS.



Recurring issue with front-end electrode that again moved by itself all the way into the target and was impossible to control until C.Mitifiot's intervention to reset it.

GPS separator magnet needed a local reset of the FGC but OK afterwards.

Proton scan on converter done on Thursday morning and stable beam to ISOLTRAP in the afternoon.

Ti production was much lower than expected despite several attempts to restore proper conditions.

ISOLTRAP took Sr/Rb beam during the w/e.

HIE:

Continuing with the phasing of the normal conducting linac.

All 15 super conducting cavities are running at 1MV/m.

Setting up of the field-regulated dipoles in the experimental lines by EPC is ongoing.

ISOLDE Users

E. Matli for K. Johnston:

On HRS the In run to the CRIS experiment finished on Thursday. This was an excellent run with many new measurements on a chain of In isotopes from ^{113}In to ^{131}In .

On GPS the leaking target of the week before resulted in a cancelled run for the ISOLTRAP experiment. Fortunately, the ISOLTRAP team were able to take a used target to explore isotopes relevant to another experiment, which is due to run later this year. The weekend allowed for systematic tests for a new way of performing Q-value measurements. Although no new data was collected, the tests were successful and the results look promising for the future runs. The cancelled run should be re-scheduled later this year.

PS

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

Very stable week with only minor issues until Thursday afternoon:

- PIPO and First Line were called for devices: PE.BSW57, PR XSE, PR.QSE, F61S.QFO01; 6h1/2 downtime for EAST beams
- Access scheduled on Friday for repairing a water cooling issue on 10MHz cavity C11; 1h1/2 beam downtime
- Following the access, the SMH16 power supply became uncontrollable after a crate reboot. A reboot of the G64 crate followed by a restart of the task restored the control; 1h1/2 beam down time

Beam status

- All operational beams as requested sent to SPS: LHCIndiv, LHC25 12b and 72b.
 - Voltage issue with 80MHz cavities solved
- BCMS work ongoing.

- East Irrad beam line set-up.
- Beams delivered at nominal intensity: AD and TOF.
- MTE sent to SPS with 600 -700 e10p.
 - 1600e10p ready and working on 2000e10p.

Question from **V. Kain**: Even though the RF issue was fixed the bunches are still too long.

Answer by **H. Demarau**: Last Friday evening the issue with the 80 MHz cavities C80-88 and C80-89 (delivering only half the programmed voltage) has been fixed by the specialist and all three 80 MHz give full voltage again for the bunch rotation. The bunch rotation timings have then been adjusted on Monday evening (actually set back to the parameters of 2016). The bunch length at extraction is now again the expected nominal 4 ns. Thomas will check again on the SPS side.

East Area

B.Rae: Good week, nothing to report.

East Area Users

H. Wilkens: The EA irradiation facility started to irradiate samples. Received requests to irradiate 230 samples with protons in IRRAD, and 12 primary users in the CHARM mixed field facility. On T9 this week the CMS timing detectors are being tested with beam, and on T10 the ALICE Inner Tracker System (ITS) as well as the Time Projection Chamber (TPC) upgrade teams are testing their device.

nToF

D. Macina: All fine. This morning there is access for installations. Afterwards it is scheduled to run until next Monday, when another installation slot is scheduled.

AD

L. Bojtar reported on the AD status ([Annex 5](#)).

No major issues encountered during the week, only resets of the ejection kicker, bunch rotation cavities and the main quad power supplies.

There was a power cut in the AD hall Monday (May 15) night, but afterwards nearly all systems were functioning correctly. Recovery took about 2 hours.

A planned intervention to the target area performed on Tuesday (May 9). It required grounding of two power supplies by the security procedure. It was arranged with First-Line in advance for 13h00, but they only arrived at the work site 1 h later. We kindly request First-Line to start the work at the arranged time to avoid loss of time for all equipment experts involved.

AD Users

H. Wilkens: All fine. ASACUSA beam permit is finally signed.

Question from **V. Kain**: What happened with the beam permit?



Answer by **R. Steerenberg**: The AD secondary beam permits were not yet fully signed when beam was sent toward the experiment for setting up the beam lines on May 1st. Following this a meeting took place last week between members of BE-OP and the BE safety unit to discuss the issue and more importantly how to avoid this happening again in the future. A list of actions has been drawn up and agreed upon for implementation.

SPS

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

Smooth start of SPS NA physics on Monday. Some downtime due to Linac2 and deployment of FGC upgrade (for main power converters).

ZS extraction septa alignment scan performed on Tuesday to minimize losses. Not conclusive yet, another scan to be performed next week.

Cooling issues of a few magnets in the NA with high duty cycle resolved in shadow of dedicated MD on Wednesday.

Since Thursday intensity on SFTPRO cycle about 1.1×10^{13} ppp at flat top with a sharing of about 15/15/45 units on the targets.

About 3.5h downtime on Friday due to PS access and issues with the PS extraction septum at restart.

Cooling issue on extraction elements in LSS2 with high SFTPRO duty cycle being investigated. Pilot and Indiv bunches sent to the LHC for commissioning activities.

25ns beam for scrubbing in preparation for the HiRadMat: up to 4×72 bunches on flat bottom. Main limitation is pressure rise in vented and partially modified LSS4 extraction area – clear conditioning already seen.

Commissioning and setting up of 800 MHz cavities ongoing.

Up to 3 batches accelerated to top energy for validation of TIDVG as requested by EN-STI – graphite outgassing observed due to heating beyond bake-out temperature with 3 batches.

HiRadMat run started yesterday.

Setting up of LHC25ns cycle is ongoing (LHC expects 12 bunches tomorrow).

Question from **R. Steerenberg**: May the TIDVG conditioning be an issue?

Answer by **K. Cornelis**: Today it reached temperature above 120 degrees and it started outgassing. Conditioning will be slow because it is graphite block now, so the gas comes from the volume and not the surface only. We increased vacuum threshold to 1×10^{-6} at the TIDVG.

The typical slow conditioning is not problem for operation but might be for certain MDs.

Question from **H. Wilkens**: When will the intensity be increased for Compass?

Answer by **K. Cornelis**: We need to get HiRadMat started first and then we will see.

North Area



B. Rae: Started physics. Unfortunately, last week could not tune H8 beam line with the primary beam ("micro beam"). Most probably the problem comes from the microcollimator. Had to fall back to secondary mode (without microcollimator) on Monday and the beam seems to be good now. Apart from this, all the beamlines started smoothly.

North Area Users

H. Wilkens: The H8 problem is annoying for UA9, they have to do it with secondary beam with larger divergence. So more time is needed to gather the required amount of data. Other users are happy.

HiRadMat

B. Rae: They are happy and should start soon.

AWAKE

S. Gessner reported for AWAKE.

Proton beam will start on 27th of May. They are preparing to sign the beam permit.

LHC

R. Steerenberg: Progressing very well with single bunches. Tomorrow they will take 12 bunches and over the weekend they will try to get stable beams. Afterwards it is planned to keep stable beams through the nights and continue commissioning during the days.

3. Technical stop

3.1. Linac2

C. Mastrostefano gave the presentation ([Annex 7](#)).

List of known items:

- Switch of pressurized air to disconnect a safety compressor
- Urgent intervention on access system of CPS.
- Cooling control
- Measure the intertank 2-3 gap.
- Maintenance of Faraday cage of the source.
- SEMgrid-LTL.MSG10V; LTE.MSG10HV.
- Visual inspection of magnets.
- FBCT filters installation.
- Vacuum Intersection tank 1.
- RP Survey & RP follow-up ITS1-2017.
- Beam Instrumentation: measurement of transformers.
- Temporary electrical supply in Bldg. 363 for BHZ20.

For the last item, it is requested to cut electricity at the moment the beam is stopped.

At 15h should be able to start back with beam to have it sent to PSB at 16h.



Comment **K. Cornelis**: SPS stop will be at least 24h, so no point in rushing.

3.2. Linac3

C. Mastrostefano gave the presentation ([Annex 8](#)).

Only one request for alignment to measure transfer line between LINAC3 and PS.

Comment from **D. Kuchler**: We will install pepper pot and it will take 24h. It was agreed with the vacuum.

D. Manglunki: Vacuum has not agreed yet.

D. Kuchler: We want to install it to see if it is an aperture restriction, and in case it is, it can be removed during the next stop.

J. Ferreira: It should be fast to pump down because it is a small sector.

3.3. LEIR

D. Manglunki gave the presentation ([Annex 9](#)).

Mostly checks:

- SMH40 covers
- CRF41 tubes
- Magnet visual inspection
- Beam current Transformer EI.BCT10 – Cable swap
- Beam ionisation monitor BIPMH – Re-cabling
- Water circuits – Verification of water pressure

Please submit impacts this week. Impact intervention period: TS1-LEIR-2017

3.4. PSB

D. Hay gave the presentation ([Annex 10](#)).

- Connection of power converters B361
- PSB: Magnet visual inspection
- TS – Urgent intervention on CPS access system
- Control of ventilation pump
- Installation of BTMS system
- Installation of FBCT filters
- Closing valve on 2MHz RF system to fix leak in 361-1-003
- Visual inspection of the magnetic septa

Need FOM authorisation for works under the false floors in the BRF2 (BSW power converters)

The total time length is defined by water leak intervention in 361-1-003 to open the water valves in the machine when it is done.

3.5. PS

S. Mataguez gave the presentation ([Annex 11](#)).

Mostly inspections:

- Inspection of L2-BOOSTER transfer line.
- Survey Check height of straight section vacuum chamber height SS01, SS03, SS12, SS13, SS14, SS18, SS19, SS20, SS21, SS43, SS44.
- Inspection septa PS.
- Inspections of the magnets in the transfer line.
- Inspection ventilation tunnel TT2.
- Inspection of ventilation control and network EG+EC.
- RP Survey & RP follow-up ITS1-2017.
- Visit Fire Safety Engineering team.
- Reparation BLM connecteur en SD69.
- Inspect UES208 pre-amplifiers.
- Measure de Bypass RF SD01, SD02.
- CPS access system repair.
- Checks for decaling campaign.
- Intervention of demineralized water system for magnet ED.
- ED network inside the ring.
- WR B-Train in the POPS feedback loop. Tests the WR B-Train in the POPS feedback loop and implement the PPM functionality for Parallel MD capability during the run 2017.

Maximum 6h time span.

There is a patch panel with many unused cables and they could be unplugged to assure that they can be removed.

Comment from **H. Demerau**: The cables have not been checked yet in detail. Sensitive equipment is fed from the patch panel. He would prefer to check the cables over the next months first.

Comment from **S. Mataguez**: So we don't touch them.

V.Kain: I think it is good moment to show the AOB item "POPS white rabbit B measurement".

F. Boattini gave the presentation ([Annex 13](#)).

Before test: (31st May 2017)

1. Change the PBL card (FGC2 crate POPS) with the one WR enabled
2. Load new FGC software (spare FGC card)
3. Simulation check of the WR transmission
4. CCC: prepare MD cycles

During the test: (1st June 2017 during four hours)

1. Run POPS with old Btrain (BupBdown)
2. Run POPS with Btrain WR transmission
3. Test Btrain by switching between pulsed and WR

After test:

1. Depending on the outcome of the Test: Reinstall old –OP cards or keep the WhiteRabbit ones

Q from **H. Demarau**: After the test, would it be possible to revert to the old system?

A: We will run with the old one. If there is a problem with PPM we bring back the old one. Switch is immediate.

Comment from **R. Steerenberg**: the beam need to be started for the night so there is no way to have any tests on June 1st.

A: Without the tests we cannot guarantee that it is operational.

Comment from **R. Steerenberg**: There is another longer stop 4 weeks later. This one is only to do the most urgent fixes.

Comment from **D. Manglunki**: It was intended to be 24h stop. It is the LHC who asks to shorten it, but with SPS not capable to restart earlier, there is no point to shorten it for all the machines.

Comment from **R. Steerenberg**: It would be good to discuss on supervisors meeting to understand exactly the times and consequences, to list the activities and arrange the schedules.

3.6. SPS:

D. McFarlane gave the presentation ([Annex 12](#))

On request of OP the magnet MBB.13350 will be replaced, where an aperture restriction is suspected.

In parallel to the magnet exchange, a cleaning of the vacuum chamber of the MBB.13330, just upstream, will be performed in the meantime. The cleaning might require moving the MBB.13330 in the passageway, to be clarified with TE/VSC.

Finally, an endoscopy will have to be performed in the interconnect between QD.51110 and MBB.51130 where another aperture limitation is suspected.

Due to the numerous interventions, it is possible that the 24h of stop will not be sufficient, and that the vacuum team will need access until 11:00 on Thursday 01.06 to remove the pumping groups.

Detailed list of interventions per BA is listed in [Annex 12](#).

Question from **J. Ferreira**: What do you expect to find in the vacuum chamber?

Answer by **K. Cornelis**: There is something like a wire or RF finger on the floor of the chamber.

Comment from **R. Steerenberg**: We need to report it to the LMC tomorrow.

D. McFarlane: No other intervention will be authorised in this extra time, so in case vacuum is at the required level earlier, the machine can restart right away.

Question from **R. Steerenberg**: The total time would be 36h?

Answer by **K. Cornelis**: 28h.

Question from **J. Ferreira**: Should we have the two inspected magnets ready to exchange in case needed?



4. Schedule Updates

V. Kain presented the latest version of the [injector schedule](#).

No MDs during this week.

Awake starts on the next holiday weekend, it should be prepared well in advance to avoid troubles during the weekend.

The LHC beams need to be prepared:

- 12 bunches requested for tomorrow
- 72 bunches next week
- BCMS 12 and 48 bunches in week 22

5. AOB

A. Bland showed [message from IT department](#) concerning the “WannaCry” ransomware virus.

The IT department distributed the patch on the supported systems as soon as it was published.

However, there are multiple systems, like oscilloscopes, which still use the unsupported Windows XP and similar. In order to minimize the risk of infection the IT department intends to close CERN wide ports used by SMB v1 protocol. This may affect some communication systems, for example file remote connection of file sharing between Windows and Linux or Linux and MacOSX.

None of the vital accelerator systems uses this protocol. However, it may happen that some remote connection will not be possible anymore.

Next Meeting: 23rd of May.

Minutes reported by P.K. Skowronski on 17th of May.



Summary of the 9th FOM Meeting

Held on Tuesday 23rd May 2017

Agenda (<https://indico.cern.ch/event/640676/>)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Technical stop activities*
4. *AFT for injectors*
5. *Schedule update*
6. *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 8th FOM](#) were approved.

There was one open action ([Annex 1](#)).

1. No update concerning the monitoring of the FGC power converters. **The action stays open.**

2. Status of the machines.

Linac2 & Linac3

M. O'Neil reported the status of the linacs ([Annex 2](#)).

It was a good week for Linac2 with only few minor issues. On Monday at noon the issue with the start/stop timing of LT.BCT20 re-occurred and triggered the watchdog. The problem was solved in half hour and reappeared at 7.00 PM but solved then in few minutes.

Linac3 also had a pretty good week. The only issue that is worth mentioning concerned the beam stopper that got stuck in for 1h45 on Friday, following an INCA update.

LEIR

D. Manglunki reported on the LEIR status ([Annex 3](#)).

It was a good week with good progress on the machine start-up. There are still some issues with the ITE.BHN30 power supplies. The EI.BCT10 inverted cabling will be corrected during the technical stop.



The first beam extraction attempt towards the PS took place last night. Unfortunately, it was unsuccessful due to an issue with the SMH26.

PSB

JF Comblin presented the status of the PS Booster ([Annex 4](#)).

The Booster had little downtime, around 2h15 in total with no major problems. The wire scanner of ring 4 vertical plane is broken and needs to be replaced.

The high intensity version of the MTE beam is now available with correct emittances. STAGISO beam has been taken by ISOLDE both to HRS and GPS, after a re-steering of the ISOLDE transfer lines. The BCMS25ns has been prepared and is available for the LHC recommissioning.

The ISOLDE Vistar configuration application should have been updated during the shutdown, which was not done. It was a FOM open action last year. **B. Mikulec** asked **M. Lozano** to remind **E. Fadakis** to proceed with the update as soon as possible. The FOM action could be reopened if needed.

ISOLDE

M. Lozano reported the status of ISOLDE ([Annex 5](#)).

It was an excellent week for ISOLDE.

GPS started delivering Mg beams to GHM on Thursday night and has been running smoothly since then. The target was replaced yesterday. Some re-steering of the BTY transfer line was needed for both GPS and HRS.

On HRS the week was dedicated to RFQ investigations and ISOLTRAP stable beam tuning.

M. Gourber-Pace commented that the issue with the empty knob for controlling the GPS separator is due to a hardware problem.

ISOLDE Users

K. Johnston said it was a good week for physics. The Emission channeling experiments using 27Mg to explore the role of Mg in nitride semiconductors ran very smoothly from Thursday until yesterday. Apart from some retuning of the RILIS lasers over the weekend, there were no interruptions; the experiment completed their program and the data look interesting.

PS

D. Cotte reported the status of the PS ([Annex 6](#)).

It was a good week for the PS with an overall availability of 87%. The PS delivered EAST beams (IRRAD normal and blow-up version), EAST NORTH (now on Target1), the dedicated and parasitic beams for TOF (~720E10ppp / ~300E10ppp) and the AD beam (1.4E13ppp). LHC PROBE and LHC INDIV beams were also available for LHC.



On Wednesday morning, TE-EPC and EN-CV adjusted the water supply pressure and flow of the 365 building's cooling system, putting an end to a series of tripping of these power supplies.

The main downtimes were related to the power supplies installed in Building 365, the quadrupole magnet ZT9.QFO04, ZT10.QFO03 (only affecting EAST beams) and FTN.QDE430 (only affecting nToF). The PS also suffered from several problems of high level on the cavities 10 MHz. The intervention of the specialists was necessary during the week-end.

The integrated intensity delivered to nToF is conform with the expectations.

East Area

B. Rae said that the blown up beam profile at CHARM was improved on Tuesday morning at the cost of some radiation alarms. On Wednesday morning First Line intervened on ZT9.QFO4 and on F61S.DHZ1 in the evening. The ZT10.QFO3 magnet stayed off over the whole night without seriously affecting the user. It was repaired by the specialist on Wednesday morning. Apart from these few issues the run was very smooth.

East Area Users

H. Wilkens said that users were happy.

nToF Users

D. Macina said that the week was very good.

AD - ELENA

B. Lefort reported the status of the AD ([Annex 7](#)).

It was another good week for the AD, except for the major blackout that occurred on Saturday.

On Saturday morning around 2 AM one of the main AD transformers tripped due to a failing temperature probe. The TE-EPC piquet was called immediately by the CCC to restart the transformer. When the power came back, the cooling station automatically restarted creating a quick variation of pressure that triggered one of the overpressure safety valves in ELENA. The valve, due to a malfunction, stayed open and a large amount of water was released in the ELENA area. The fire brigade had to pump a few centimetres of water out from the ELENA / GBAR area.

Thanks to the help of many different teams (piquets, supervisors, operators, fire brigade...) the beam was back for physics at 13:20.

B. Lefort added that it would be nice if TI could set up a mailing/SMS list to inform the relevant people when a major issue occurs on a machine. **J. Nielsen** answered that TI is already looking at such a procedure.

S. Deval said that he was aware of the issue with the cooling system and will follow it up.



J. Nielsen said that there are, at CERN, 51 similar transformers to the one that failed during the weekend. The issue is understood and the communication modules will be replaced on all the transformers during their next maintenance.

T. Erikson added that the ELENA beam permit should be ready for next Monday, in order to restart the commissioning with anti-protons.

AD Users

H. Wilkens said that ATRAP prolonged their apparatus tests (had to be warmed up). The ASACUSA experiment took the beam last week.

SPS

Karel reported the status of the SPS ([Annex 8](#)).

Besides providing FT beams, pilot and INDIV beams to LHC and HiRadMat, the SPS continued its dense start-up program. The 25ns LHC filling cycle was commissioned with 12 bunches nominal and BCMS. The 12 bunches were taken by the LHC on Saturday. Four nominal batches were accelerated on the HiRadMat2 cycle and used for scrubbing and beam dump commissioning. The AWAKE cycle was commissioned since it is programmed to be used the next weekend. The Fixed target intensity was doubled last Thursday (now with 15e11, 30e11, 100e11 on T2, T4 and T6). There was a problem with the cooling on the north extraction septa, which would overheat in the high duty cycle (1 cycle/18s). It was fixed last Thursday, and since then, this duty cycle was used whenever possible.

North Area

B. Rae said that it was a good week. The setting up of P42+K12 beams successfully completed at 50% of nominal intensity (NA62 requests at this stage to run at 60% of nominal for most of 2017). There are still some flat tails on the beam profile at T4, which affect the transmission to T10, which is nevertheless acceptable (at least as good as in 2016) at higher T4 fluxes. The angle at T4 had to be changed much more than usually by changing the horizontal reference position of the BSM upstream of T4 by 5 mm (from 57 to 62 mm, theoretical 65 mm). Not understood why, as in principle this section was not realigned. The spill is quite good, but there are occasionally some spikes at the beginning and/or 50 Hz, which requires regular attention from the operators.

On Thursday evening an intervention on ventilation dampers for ECN3 became urgent (very high temperature in TCC8 and ECN3, affecting electronics), requiring an access to BA81 (cutting the whole NA). It took less than an hour.

North Area Users

H. Wilkens said that the COMPASS and NA61 experiments were happy with the beam intensity and quality.



AWAKE

E. Gschwendtner confirmed that they will start to take the beam on Friday.

LHC

R. Steerenberg reported very good progress over the last week. LHC will go to stable beam today and will then interleave commissioning, physics and scrubbing for the rest of the week. A scrubbing run is scheduled for 24 hours on next Monday and will then resume for 6 days the following week. The beam request for the scrubbing run concerns a LHC25 beam with nominal intensity and 72 bunches.

TI

J. Nielsen said there was nothing else to report than what was already mentioned.

3. Technical Stop activities

R. Steerenberg said that it was agreed by management not to postpone nor shorten the technical stop. At the same time one should make as best as possible use of the LHC during the TS. Meaning that the LHC should be filled as close as possible to the TS starting time with 72 bunches and go for a long pilot run.

Linac2

C. Mastrostefano presented the list of Linac2 TS activities ([Annex 9](#)).

The cabling work between the Linac2 and Linac3 will take up to 9 hours. If the Linac2 has to be restarted at 4.00 PM, beam should be stopped around 6.00 AM.

R. Scrivens added that the Survey team will make a scan in the Linac2 (no yet on the IMPACT list).

B. Mikulec said that, unfortunately, as no one from RP is present, the exact beam stop times cannot be fixed during the FOM.

Linac3

C. Mastrostefano presented the list of Linac3 TS activities ([Annex 10](#)).

The installation of the pepper pot is still pending for vacuum group green light.

PSB

D. Hay presented the list of PSB TS activities ([Annex 11](#)).



The connection of the BSW power converters to the cooling circuit requires work under the false floor, for which a VIC was organized. It was agreed that the intervention could take place during the TS. **S. Deleval** confirmed after the meeting that the flexible water pipes that will be installed are not of the same type as the ones that induced flooding earlier this year in the Linac4 building.

2 wire scanners will be replaced on ring 1 and 4, requiring around 24h for vacuum recovery.

LEIR

D. Nicosia presented the list of LEIR TS activities ([Annex 12](#)).

The list is similar to the one presented last week. There is no especially lengthy intervention that could delay the restart.

PS

S. Mataguez presented the list of PS TS activities ([Annex 13](#)).

The repair of the BLM could take up to 6 hours (still difficult to estimate, as the issue is not precisely known). The aim is to start POPS tests from 3.00 PM. C. Mugnier confirmed that the POPS tests could start only once the machine accesses are over. In case of problems after restart with beam it would take about 1h to return to the current configuration.

SPS

D. Mcfarlane presented the list of SPS TS activities ([Annex 14](#)).

The present list is still smaller than what one could expect for a technical stop (only 52 IMPACTS) and it will certainly still grow in the coming days. The main intervention is the MBB13350 replacement (~4h intervention plus 24h pumping). The lift and monte-charge maintenance schedule was adapted to fit the magnet replacement activity constraints. It could also be modified (even on short notice) if needed.

4. AFT for injectors

C. Roderick gave an introduction to AFT for the injectors ([Annex 15](#)).

AFT is operational for the injectors since early April and still under development. Its architecture is described and its main inputs are coming from the elogbook. **C. Roderick** gave a demonstration on how to use the different functionalities of the dashboard, statistics tools and cardiogram.

B. Mikulec acknowledged the AFT and elogbook team for their excellent work.



5. Schedule update.

B. Mikulec presented the injector schedule version 1.1 ([Annex 16](#)).

AWAKE will start to take the beam this week. The 24h UA9 run is scheduled for next Tuesday starting at 8 AM – exact beam stop times for the last fill still have to be defined by RP.

The technical stop will start on Wednesday (30th) morning and will last at least 24 hours (28h for SPS). Beam stop times will be communicated once information will be provided by RP.

6. AOB

There was no AOB.

Next Meeting: Tuesday 30th May 2016.

Minutes reported by [JB. Lallement](#) on 23rd May.



Summary of the 10th FOM Meeting

Held on Tuesday 30th May 2017

Agenda (<https://indico.cern.ch/event/642059>)

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

B. Mikulec chaired the meeting.
The presence list can be found in [Annex 1](#).

1. Follow-up of the last FOM

Minutes of the last meeting were approved.

Follow up of the open action: **C. Mugnier** has organized the meeting that is scheduled on June 28 to discuss required improvements for monitoring and/or procedures for FGC power converters.

2. Status of the machines

Linac2 & Linac3

D. Kuchler reported the status of the Linac2.
Linac2 was running smoothly.

Linac3 developed an issue with the RFQ on Wednesday. The amplifier was repaired, but still there is some sparking. Should be fixed tomorrow.

Question from **B. Mikulec**: Is the reason of the problem understood?

A: Yes. The RFQ coupler came to the end of its life, which is normal as it wears out. The newly installed piece was apparently not a good one and now it needs to be replaced again.

LEIR

D. Manglunki reported for LEIR ([Annex 2](#)). It was a beam commissioning week.



There were still some issues with the ITE.BHN30 power supply. First Xe beam extracted to PS last Tuesday. LEIR was in standby during the Ascension long week-end. No beam on Monday due to the Linac3 RFQ amplifier shorted gaps.

PSB

A. Findlay presented the status of the PS Booster ([Annex 3](#)). 99% availability. No major issues to report. 2 faulty wire scanners (R1 H & R4 V) will be replaced during the upcoming technical stop. MTE beam with 600E10 is now available for tests with PS.

ISOLDE

E. Siesling reported the status of ISOLDE ([Annex 4](#)).

HRS:

STAGISO tests were carried out last Tuesday after which HRS has been in standby. Target change on Monday.

GPS:

The originally planned new target was unfortunately not ready and it was decided to use last year's target #513 carbon nanotube for the production of the 8B beams.

Stable beam setting up and proton scan plus yield checks (on Sulphur Fluorides, Tantalum Oxides, Tantalum Fluorides and Boron beams) finished on Tuesday evening showed positive results, which led to the decision to continue the run with this used target.

Tuesday night during IDS stable beam tuning the HT gave up after a whole day running perfectly at 60kV; not possible to ramp it back up.

Wednesday morning an intervention in the HT room had been planned anyway to replace a leaking heat-exchanger gauge and this access was used as well by the specialists to investigate the failing GPS (HT2) power supply. The power supply was replaced by the spare, which had just come back after a previous failure a few weeks ago. Several checks pointed this time to an issue at the GPS Front-End side and after severe investigations CV found the de-humidifier in the zone malfunctioning and using up (leaking?) chilled water used for condensation of the target zone air. This repair can only be carried out during the technical stop on Wednesday due to radiation in the target zone.

It could still run at 30kV, which is sufficient for the IDS users.

Wednesday morning after the intervention, when finally HT was back GPS suffered from another failure. This time the problem was related to a tripping circuit breaker, which cut all power in the HT room including HT and target heating. It is not known what caused it and after re-arming the circuit breaker all went rather smoothly.



Since Wednesday evening IDS is taking data on radioactive Boron beams from GPS using full intensity and max p-current from the PSB. The run will finish Monday morning when beam will be taken by REX for Trap and EBIS tests.

Few more issues during the run:

- Friday after refilling the SF₆ gas in the target gas-line the yields did not improve as expected. The beam also needed retuning/calibrating. This will be discussed with the target group to have a better understanding of what is happening inside the target.
- Saturday night a few trips of the vacuum gauges causing some elements to trip and vacuum valves that closed. Sunday morning the target anode voltage tripped.

Despite quite a number of unforeseen circumstances and issues, from the physics point of view it was a good week with very happy users with the obtained data.

ISOLDE Users

K. Johnston: Very happy users. The experiment was running with 8B beams (extracted as BF₂ molecules), which is still a relatively new and challenging beam at ISOLDE. A newly prepared target developed problems with the chemistry required to produce these beams (especially during the fluorination process), but fortunately the original prototype target unit was available and was found to work well. Running at 30kV was not ideal (50kV was the desired acceleration voltage), but was acceptable in the end. Hopefully by tomorrow it will be fixed because it is needed for the remaining part of the run.

The experiment IS633 used the ISOLDE decay station to measure the beta-decay of the halo nucleus 8B into 8Be, on which not much data exists. This was the first part of the experiment where precise measurements of the decay were collected. The second part of the programme will focus on measuring a weak proton branch, and will run later this year or in 2018. The first part of the experiment yielded excellent data and this part of the experimental programme is completed, with satisfied users.

Question from B. Mikulec: The HV voltage problem was due to the dehumidifier?

A: Yes, the high humidity lead to sparking.

Comment from B. Mikulec: Quick reminder: please always inform TI in case of electrical or cooling and ventilation issues, even if the specialist is contacted directly. This way the issues can be better tracked and handled if a problem persists.

PS

I. Efthymiopoulos reported the status of the PS ([Annex 5](#)).

Good week with multiple users and 95% availability. On Saturday for EAST_IRRAD-CHARM beam the PS had to reduce the number of cycles by 20% because cooling could not deal with the hot day and SMH57 was tripping. Delivered to nTOF 14.1% of the request intensity.



Comment from **S. Deval**: The cooling issue is probably just a reduction of flow, for example because of a motor. We will follow it up.

Comment from **M. Houricane**: There was a 2 degrees temperature increase observed.

Answer S. Deval: The 2 degrees offset is normal.

Comment from **K. Hanke**: I think that the cooling is at the limit. This type of problems is recurring and is always fixed by some temporary measures. It should be brought up to the management and an upgrade plan worked out.

East Area

No report.

East Area Users

H. Wilkens: Very happy users, it was a good week.

nToF

D. Macina: All fine.

AD

P. Freyermuth reported on the AD status ([Annex 6](#)).

Availability of 98%: couple of hours due to an injection line power supply fault and an RF issue in the PS. Two periods with degraded intensity due to a missing cavity that was finally fixed by a PLC upgrade. Observed intensity drifts during hot days. The exact reason is still not understood.

Question from **B. Mikulec**: Do you have any clues concerning the drift?

A: The intensity drift is most probably a temperature effect. The beam was not yet fully optimized, so it is very likely that a very small effect pushes the beam out of acceptance range.

Comment from **T. Eriksson**: Yesterday for the first time ELENA took anti-protons from AD.

AD Users

H. Wilkens: The power cut that happened 10 days ago showed a communication issue. Now we look for solutions how the experiments should be informed in case of such major events.

SPS

F.M. Velotti reported the status of the SPS ([Annex 7](#)).

An average week for the SPS, with 98% beam availability.

Main down time:

- Injector complex.
- RF 800 MHz: non-blocking issue but it didn't permit LHC 72 b injection on Wednesday. Beam delivered on Friday and ready for Monday scrubbing.
- Access (hence not a fault) in NA for hardware installation.



First experiment of HiRadMat is done. 3 high intensity shots (216 bunches) were delivered with new optics. Beam size at the experiment is uncertain, the investigation is ongoing.

Question from **B. Mikulec**: What could be the reason for the uncertainty?

A: The optics is new and the profile sizes are not as expected.

AWAKE is being commissioned. Primary proton beam was delivered to the plasma cell. Alignment of the beam with respect to the iris at the plasma cell done. Aperture was checked.

North Area

No report.

North Area Users

H. Wilkens: There were problems with H2 beam line: some magnets settings of cooling temperature and flow were changed without informing the user (CMS) so they could not be operated with nominal beam, and the experiment could not proceed.

Question from **B. Mikulec**: Do I understand correctly that it was a communication problem?

A: Yes.

Comment by **S. Deval**: All the users on our list were informed and it was presented at the AITM.

Comment from **B. Mikulec**: Either the users need to attend the AITM meeting (or at least read its minutes), or the way the information is spread should be changed.

AWAKE

E. Gschwendtner reported for AWAKE. The run started last Friday. Proton beam, laser beam, diagnostics successfully commissioned and aligned. Now there is an access for laser works, also technical work and heating up the Rb plasma cell. From Thursday on AWAKE will start with plasma cell physics.

LHC

R. Steerenberg: The LHC operates with 300 bunches. This morning start with BCMS beam. Yesterday there was one fill for scrubbing, which provoked some problems with the access and cryogenic systems.

At 4AM before the technical stop the LHC foresees to take a 400 bunch fill and plans to keep it as long as possible.

Question from **B. Mikulec**: Is UA9 informed?

Answer by **V. Kain**: Yes, we will be able to refill for UA9 just after serving the LHC.

Comment from **R. Steerenberg**: The LHC could eventually delay the refill for some minutes if needed.

TI

Easy week.



3. Technical stop schedule and update

The coordinators showed the latest list of interventions for [Linac2](#), [Linac3](#) and [LEIR](#). No major changes were signalled. For the remaining machines no changes with respect to the plannings presented on the previous FOM were confirmed.

Comment from **D. Mcfarlane**: There is a high possibility that the RP will block the magnet change in the SPS because of high radiation in the area.

Comment from **H. Vincke**: The levels rose recently, and now we simply don't know what is the dose.

Question from **B. Mikulec**: What is the decay rate in case the level is high and we needed to estimate the required cool-down time?

Answer by **H. Vincke**: Not sure, it all depends on the initial value that is unknown. There is a high chance that the intervention will be possible.

Comment from **D. Mcfarlane**: Assuming the RP gives the green light, the access starts at 8:30.

Question from **R. Steerenberg**: For the apertures that will be checked with endoscopy, in case it turns out that the magnet is damaged, are there spare magnets ready?

Answer: Yes.

Comment from **H. Vincke**: We knew that this RF finger was affected since quite some time and we should plan this intervention earlier for a shutdown period when the machine is cooled down.

Answer **V. Kain**: I agree.

Question from **R. Steerenberg**: What is the expected impact of this intervention on the performance of the SPS?

Answer by **V. Kain**: We will need to scrub because the sector will be vented. It should be quick, but there will be some impact.

Reminder from **H. Vincke**: Cool down times need to be watched (see the last meeting for details) and only special Technical Stop Impacts have to be used, not the standard ones.

Question from **R. Scrivens**: In case of an urgent additional intervention, the standard Impact still could be used?

Answer: Yes.

Question from **F. Tecker**: When will the PS Booster restart?

Answer by **B. Mikulec**: Not earlier than 24 hours from the start of the Technical Stop, and it all depends if all the interventions go as planned without unexpected issues.

4. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).



5. AOB

No AOB.

Next Meeting: 6th of June.

Minutes reported by P.K. Skowronski on 31st of May.



Summary of the 11th FOM Meeting

Held on Tuesday 6th June 2017

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

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

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The list of presence can be found in [Annex 0](#).

The [minutes of the 10th FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

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

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

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

LEIR

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



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

PSB

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

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

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

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

ISOLDE

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

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

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

ISOLDE Users

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



PS

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

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

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

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

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

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

East Area

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

East Area Users

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

nToF Users

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

AD

T. Eriksson reported the status of the AD.

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



AD Users

H. Wilkens said that everything went fine.

SPS

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

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

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

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

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

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

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

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

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

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

H. Vincke asked what could be done to reduce the activation at 133, especially in view of the intensity ramping-up.

K. Cornelis answered that this hot spot has always been there, but it was less visible last year because of intensity limitation. An endoscopy should be planned during the next TS. In the meantime, one



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

North Area

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

North Area Users

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

AWAKE.

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

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

LHC.

There was no report.

TI

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

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

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

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

3. Technical stop report

Linacs



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

LEIR

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

PSB

There was no report.

PS

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

SPS

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

4. Schedule update.

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

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

5. AOB

There was no AOB.

Next Meeting: Tuesday 13th June 2016.

Minutes reported by [JB. Lallement](#) on 8th June.



Summary of the 12th FOM Meeting

Held on Tuesday 13th June 2017

Agenda (<https://indico.cern.ch/event/645622>)

- 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](#).

1. Follow-up of the last FOM

Minutes of the last meeting were approved.

2. Status of the machines

Linac2&Linac3

R. Wegner reported ([Annex 2](#)) that both Linac2 and Linac3 had an excellent week with 100% availability. Linac3 was delivering 35uA Xenon beam.

LEIR

S. Jensen reported for LEIR ([Annex 3](#)). A good week with 96% availability. Only on Monday there was an issue with LN3 cooling.

PSB

K. Hanke presented the status of the PS Booster ([Annex 4](#)). Very good availability of 99.6%. The RF specialist investigated throughout the week on the R2 C02 cavity, which needed a beam stop on Thursday. All problems could be understood and fixed (several actions taken, in the end the problem was related to a faulty insulation on a few cables, which was difficult to find as it was hidden). In this context the Finemet cavity was also revived in order to be put in operation (was in the end not done, but it is good to have it available as backup).

The only other real issue of the week was a fault of BE4.DHZ11L1; the piquet was called, but the power supply came back by itself before the piquet arrived.



M. Gašior *et al.* fixed the tune measurement, and systematic measurements were done with the wire scanners (R3 vertical shows jitter), and the BI team worked on a noisy pickup (BTP.BPM20-H).

On Sunday evening there were a few resettable trips of the extraction kickers. Only a few minutes downtime.

All beams were delivered within specification and PSB started the setup of the LHC50 beam in view of the LHC MDs.

ISOLDE

L. Fadakis reported the status of ISOLDE ([Annex 5](#)).

ISOLDE low energy:

- HRS: Last Wednesday COLLAPS finished their run on 27Al.
- GPS: Delivered radioactive beam (51 to 61Mn) on Thursday to users (both GLM and GHM lines).

A few issues:

- The high tension was tripping above 30kV on Tuesday. By careful conditioning managed to ramp it to 40kV, which was acceptable for the users, although they had requested 50kV for this run. Investigation on site by experts ruled out some possibilities, but could not identify the issue.
- Suffering from RILIS instabilities, mainly due to the issue with the air conditioning in the lab that causes temperatures fluctuations, which in turn cause wavelength fluctuations. This lowers the beam efficiency.
- Target front-end PLC malfunctioned. It is responsible for all interlocks and it caused the interlock for vacuum to not be sent. It led to a decrease of target and line heating and to an HT trip. After a power cycle the expert needed to manually load the configuration values, as they got lost.
- GLM deflectors got stuck and their stepper counter needed to be restarted in order to move them again.

REX/HIE-ISOLDE:

- First beam through CM3. $E=1.88$ MeV/u (7gap2 energy) $A/q=3.5$.

Question from **B. Mikulec**: The ventilation issue with RILIS room was already reported before the Technical Stop and it was supposed to be fixed during the TS. Could this not be done?

Answer by **S. Deval**: The problem with the RILIS air conditioning is followed by EN-CV, but the system is working really at the limit (design problem). A working solution has been found and since last weekend conditions inside the room are more stable.



ISOLDE Users

K. Johnston: This week ISOLDE was running solid state experiments with Mn beams for two different types of spectroscopy: emission channelling and Mossbauer spectroscopy. Emission channelling went very well, excellent new data on topological insulators was obtained, the experimental team is very happy. For Mossbauer it was not so straightforward, in addition to the problems over the weekend at ISOLDE there were issues with their setup in terms of alignment and detectors. Nonetheless, good data were obtained in the end, although the full physics programme wasn't possible.

PS

H. Damerou reported the status of the PS ([Annex 6](#)). Good week with about 93% of beam availability. The main issue was due to the amplifier on the 40 MHz cavity in SS77 that had to be exchanged on Friday, which took 5h30. The remaining issues:

- Transition crossing triplet down – 1h20 downtime for all beams (above 5.7 GeV)
- Circuit breaker on 10 MHz cavity in SS76 – 0h40 downtime for all beams
- Tuning issue with C40-78 – 1h40 intermittent LHC beam with 25 ns spacing
- Fault of power converter of ZT8.QDE01 – 2h25 downtime for EAST_IRRAD (relay card changed)
- Fault of ejection septum PE.SMH57 (due to warm weather?) – 1h00 downtime for EAST beams
- Fault of power converter of FTN.BHZ403 – 0h55 downtime for TOF

Available user beams: LHCPROBE, LHCINDIV, LHC25#12b, LHC25#72b, LHC25#12b_BCMS, LHC25#48b_BCMS, AD, EAST, MTE, TOF.

Recent updates:

- LHC-type beams: Trying operation with both 40 MHz cavities
- MTE: Intensity increase to $1.7 \cdot 10^{13}$ ppp
- 8b4e: Basic check with 32 bunches at extraction
- Xe setting-up: Basic RF setting up, bunch length at extraction ~4 ns

East Area

B. Rae: Nothing to report

East Area Users

H. Wilkens: All fine, happy users.

nToF

M. Bacak: Everything was going fine.



AD

L. Bojtár reported on the AD status ([Annex 7](#)). Availability was 95%.

The issues:

- 09/06 afternoon: power supply DR.SCOMP2607 needed a repair (1.5h downtime)
- 12/06 evening: the beam request server was not working correctly. The beam destination was changing on every second cycle by itself.
- Power supply DE.QDE7030 had a control problem and it was oscillating between positive and negative currents. This was only a problem for the ELENA transfer line MD.
- Problem with ATRAP access system, solved quickly.
- ATRAP super conducting solenoid magnet quenched and steering of the Alpha line had to be adjusted.
- Red radiation alarms when the injection kicker trips.

T. Eriksson said that ELENA started the regular operation. The beam is not yet circulating. The beam control is difficult due to very limited number of beam instrumentation, especially in the transfer line.

Question from **B. Mikulec**: Did you ask BI for additional instruments in the transfer line?

A.: The new devices are ready, but they are waiting for vacuum acceptance tests. Also their installation will take some time because they need to be baked out.

AD Users

H. Wilkens: The requested amount of liquid He by the AD experiments exceeded the production capacity of the central liquefier plant. TE-CGR specialist (Johan Bremer) will join the AD user meeting this afternoon to discuss solutions to arrive to a smoother profile in the liquid He request. The peak in request might be related to the ATRAP magnet quench last week.

SPS

K. Cornelis reported the status of the SPS ([Annex 8](#)). It was a good week with 90% availability. The main activity was the production of the beam for the LHC scrubbing, which was initially troublesome. Low thresholds on BLMs, difficulties with the 40 MHz in the PS and occasional transverse instabilities in the SPS were at the origin of these troubles. By the end of the week the situation improved and LHC filling went much smoother. On Friday morning access was needed for an intervention on the TI2 beam loss monitors while the PS was off for the repair of a 40 MHz amplifier. Fixed Target intensity was increased Thursday morning to $3 \cdot 10^{13}$. It took until Friday to achieve good transmission by carefully trimming both CPS and SPS. During the LHC filling the SPS suffered sometimes from a vacuum interlock and high spark rates on the ZS. On Wednesday there was a successful MD using the SHIP cycle for short slow extraction studies.



The intensity on the fixed target cycle was increased by a total of 50% and the AWAKE operation continued.

North Area

B. Rae: Good week. During the weekend there was an abnormal consumption of CO₂ and the storage tank was emptied. CO₂ was available again yesterday with low pressure. The cause is not yet understood, but it is likely due to a safety valve.

North Area Users

H. Wilkens: Happy users, COMPASS finally at nominal intensity.

HiRadMat

No report.

AWAKE

AWAKE continued measurements of the self-modulation instability of the proton beam in the plasma with different beam intensities, different plasma densities, different timings of the laser w.r.t. proton beam.

A lot of time is needed for laser and proton beam alignment and whenever the proton trajectory changes also the laser has to be realigned. AWAKE suffered as well from the long super cycle in the SPS with only 1 AWAKE cycle. There are quite some fluctuations of the beam intensity, up to 50%.

It is planned to re-fill the Rb flasks on Monday, a procedure that takes 3 days. However, on Sunday an electric heater of the Rb flasks broke and an access was required. The system was switched off already on Sunday, advancing the re-filling by 1 day.

The SMI measurements will restart on Thursday, when the plasma cell is operational again, running until Monday (included).

In parallel SPS RF MDs were performed on the AWAKE cycle on Monday and Tuesday, introducing the bunch-rotation at flat-top and improving the longitudinal bunch-length.

Comment from V. Kain: the LHCINDIV beam, which is delivered to AWAKE, is known to be fluctuating. To find a solution for more stable beam conditions discussions might be needed. For example, the SPS could block sending the beam to AWAKE if the intensity is not within the specs. It should be understood in which machine the major contribution to the instability is originating.

LHC

R. Steerenberg reported for the LHC. There was a very successful scrubbing run. Sector 12 that was vented due to a magnet intervention is now back to the past year condition. 2820 bunches were filled, what is a new record.



After the scrubbing finished the LHC is back to intensity ramp-up. The last point was 600 bunches per beam and the next step would be 900.

Last night cryogenics tripped due to a compressed air pressure sensor.

TI

No issues.

3. Schedule Updates

B. Mikulec presented a proposed [injector schedule](#) update (version 1.2).

The COLDEX run, which was scheduled for week 25, is proposed to be moved to week 50. It needs to be confirmed by RP if this is compatible with the shutdown interventions that would start the week after.

Question from **K. Cornelis**: What would be the exact required beam parameters for COLDEX? The same as for the LHC scrubbing?

Comment from **H. Bartosik**: We need to meet and discuss the parameters in detail before judging if there are any extra limitations.

Question from **M. Gourber-Pace**: For the Technical Stops in July and September, are the Friday afternoon restarts confirmed?

Comment from **L. Fadakis**: We would like to restart earlier because ISOLDE operation is not running 24/7 and it would be unfortunate to lose whole the weekend of physics beam.

Question from **H. Bartosik**: Before next Technical Stop there is a 24h cool down period. Could we use it for low intensity coasting beam studies?

Answer by **R. Steerenberg**: In the past RP always asked to stop the high intensity beams 10-16h before the start of the interventions and it is reflected now in the schedule. I think that low intensity beams should be permitted longer.

Answer from **B. Mikulec**: The exact times can be defined only when all the details of the planned interventions are available, but it would be very helpful to obtain as soon as possible an estimate from RP.

Comment from **H. Bartosik**: Concerning the dedicated MD tomorrow in SPS: there will be no beam to the North Area apart from isolated short periods, only if the situation permits.



4. AOB

D. Chapuis requested to perform the maintenance of the LEIR access point YEA01.LEI=150 from June 14 08h30 until June 16 17h00. During this time no access through this point would be possible.

Comment from **D. Nicosia**: We will access LEIR today and it is fine for the maintenance from Wednesday to Friday.

The intervention has been approved.

Next Meeting: 20th of June 2017.

Minutes reported by P.K. Skowroński on 13th of June.



Summary of the 13th FOM Meeting

Held on Tuesday 20th June 2017

Agenda (<https://indico.cern.ch/event/647102/>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Schedule update*
- 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 12th FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

JB. Lallement reported the status of the linacs ([Annex 1](#)).

Linac2 had a very good week with just a 10 minute downtime on Wednesday afternoon due to a glitch.

Linac3 had a good week as well. The source tripped for 10 minutes on Monday because of an interlock on the solenoids cooling water temperature as the chilled water production stopped. The linac went also down for 15 minutes because of the glitch on Wed. afternoon.

LEIR

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

It was a pretty good and quiet week. The Linac3 team took the beam for an MD all Tuesday. On Wednesday the LLRF HW was cleaned up and set up. The LLRF team has removed old crate, switch etc... and set up the servo loop and the beam. Some validation tests were done on new ITE pick-ups on Thursday. The ER.QFN2040 power supply tripped on Sunday. The BCT10 polarity issue was corrected.

During the week EARLY was available for PS and NOMINAL was accelerated, but not extracted.



V. Forte presented the status of the PS Booster ([Annex 3](#)).

The PSB had a 97.5% availability over the week and smooth operation apart main faults on Wednesday, due to few electrical glitches, and an MPS blackout on Thursday due to an issue on the interface keyboard of a converter. Some problems for tune measurements on R1 and R2 (followed up by BE/BI and Alan), probably due to an unexpected drift in time of the kicked signal on the tune BPM. A workaround has been found to perform measurements, but investigations are still on-going. A BPM (BTP.BPM20) in the BTP line has noise issues. The PSB-PS energy matching has been successfully performed, to be confirmed by the RF specialist.

Operational beams are within specifications and other beams have been prepared for LHC MDs, like high intensity LHC50 and high intensity doublets, which are urgent for setup in PS and SPS.

Since Thursday the Linac4 ABP team is in the CCC-PSB island to re-start the Linac4 and train the PSB OP team.

ISOLDE

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

GPS: The switch from Mg to In took place on Tuesday. The run stopped on Wednesday morning at 9:30. The target was changed on Friday morning (#601 removed, #603 installed). There were problems controlling shutter and clamps (both were recalibrated). This was due to last week's problem with the PLC when an old configuration was restored, but no calibration was done in order not to perturb operation. Preliminary set up at 50 kV to YGP.BFC4900 started.

HRS: The target was installed and set up on Monday. CRIS took beam from Tuesday. There were issues with the RFQ stability probably due to overheating of the amplifier. In the evening large oscillations in beam intensity caused by a problem with YHRS.QP330-NEG (AQN oscillating between CCV and zero). First Line intervened and everything returned to normal after removing and reinstalling the power supply. On Wednesday a new proton scan and yield checks were performed in the morning. Beam back to CRIS in the evening. Recurring problems with the separator magnet. On Thursday the PSB MPS problem interrupted the beam for ~2h. The slits got stuck and required intervention of the expert to reset the position. On Friday there were other checks of the status of the separator after a week of unstable beam conditions. The cable of YHRS.QP180 was found not properly connected and the separator retuned. The beam was back to CRIS in the late afternoon and for the all week-end.

ISOLDE Users

K. Johnston could not be present at the meeting. He sent the following report.

Last week at ISOLDE the CRIS experiment (laser spectroscopy) were taking potassium isotopes with the intention of measuring the hyperfine parameters of 51K and 53K. Initial yields were not promising and once some technical issues were solved on Friday, this seemed to be confirmed. The production of even relatively "easy" K isotopes was low and 51K and 53K were out of reach. The experiment was able to perform some systematic studies of non-exotic K, but the physics program was impossible due to the low yields: no new data were obtained. The experiment may be re-scheduled – if possible – later in the year.



PS

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

It was a good week for the PS with more than 95% availability.

There were issues with some power convertors (mainly doublet and SMH16) and trips due to power glitches. The SMH57 tripped due to too high cooling water temperature (affecting EAST beams). TOF, EAST, AD, MTE and LHC beams were delivered.

The standard LHC25ns emittance sent to HIRADMAT was a bit too large (around 3 mm.mrad). Investigations are on-going. On Wednesday there were several cavity trips due to glitches. On Thursday, during the booster MPS fault, an access was given for the repair on the C76 cavity relay gap. Following the access, an expert was needed for the POPS restart. On Friday, a Booster-PS energy matching was performed with LHCINDIV-type beams.

The setting-up of LHC25ns_8b4e and LHC25ns_Doublets advanced well over the week-end. The ToF delivered integrated intensity is well on schedule.

After discussion, **J. Nielsen** and **M. Hourican** concluded that the SMH57 cooling issue should be followed up by EN/CV.

East Area

B. Rae said that except from the cooling issue on the SMH57 that affected the EAST beam production, it was a pretty good week.

East Area Users

There was no report.

nToF Users

M. Bacaq said there was nothing special to report.

AD - ELENA

L. Joergensen reported the status of the AD.

The AD had another very good week. The only real issue was some strange setting for the magnets just before the AD Target. After the PS went down on Thursday, the AD was only ejecting half of what it does normally. Everything was thoroughly checked both on the AD and the PS side. Nothing special was found. In the early evening the beam was optimized right before the target and the full beam at the AD was very quickly recovered. On Friday, at noon, the beam suddenly halved again. The beam went back after the original settings were restored. The root cause of this issue is not identified yet and investigations are on-going.



Concerning ELENA, **T. Eriksson** said they were still debugging the transfer line.

AD Users

T. Eriksson said that everything went fine. The BASE experiment is starting this week and they experienced some issues with the controls and the working sets.

M. Gourber-Pace said the controls issue was only affecting the FGCs control. It looks like the issue is coming from the RBAC permission. Investigations are on-going and a BE/CO staff is presently working on it.

SPS

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

The SPS had an availability of 90% in week 24 with roughly 5.5 h downtime caused by the SPS injectors, followed by a bit more than 4 h of downtime for extraction systems with the ZS sparks and the LSS4 MKE extraction kicker no trigger issue.

This was also the last week for the first AWAKE run this year. One of the highlights this week was the successful bunch rotation MD, which delivered bunch lengths of ~ 200 ps (1 sigma) for the AWAKE experiment. The frequent MKE extraction kicker no trigger issues are understood, albeit not solved yet. The extraction is intermittently inhibited while the PFNs are already charged due to power converter interlocks (this was solved) and also FMCM interlocks on the TT41 RBI. The latter one will have to be followed up this week.

Fixed target physics continued with $\sim 3e+13$ extracted. The normalised losses on the ZS are increasing again and ZS is frequently sparking. The cathode on ZS2 was found misaligned and the losses should be reduced a lot after its realignment planned for this week.

The LHC is now taking 3 batches of BCMS beam with 225 ns batch spacing. The bunch intensity was increased to $1.2e+11$ towards the end of the week. The emittances are typically 1.6 to 1.7 μm .

HiRadMat28 for the LIU transfer line collimators and the new TDI in the LHC was carried out this week. Up to 288 bunches of 25 ns standard beam were extracted on to different graphite and C-C materials. The experiment is essentially finished. One of the measurement systems did however not work as expected for one of the materials. HiRadMat was run with two 800 MHz cavities, but was frequently longitudinally unstable. The transverse emittances were also too large (~ 3 μm compared to ~ 2.6 μm reached before) from the PS. The spot size measurement in the line with a dedicated screen at the target location needs further studies.

North Area

B. Rae said it was a good week. The CO2 leak mentioned last week was due to a “disconnected” beam instrumentation. A report on the incident will be written this week by the expert.

North Area Users



There was no report.

V. Kain said that because of the ZS realignment the North Area beam intensity will be lower in the coming days.

AWAKE

E. Gschwendtner said that the Rubidium re-filling of the plasma cell went smoothly and the experiment was restarted on Thursday. In parallel the proton trajectory was optimized to AWAKE during these days and additional measurements of the beam waist at the plasma cell and setup the bunch-rotation of the proton beam in the SPS were performed. On Saturday the communication to the plasma cell was lost. An access to the service gallery to switch to the spare power supply was needed, as the original one blew a fuse due to a failure to ground. The experiment stopped on Monday morning at 5:00 until when the experiment continued with further proton beam self-modulation-instability measurements, scanning with different plasma densities, laser and proton timings, and proton beam intensities. For the next 2 months installation of the electron source/beam line system continues, with the main efforts on cabling. Another AWAKE SMI physics run is foreseen in August in weeks 33/34/35.

LHC

R. Steerenberg could not be present at the meeting. He sent the following report.

The LHC is very well advanced in the intensity ramp-up with 1800 bunches and the next step should be ~2300 bunches. Sunday night and yesterday morning the LHC was stopped due to several water leaks in the main power converter of arc 1-2. This was repaired yesterday and stable beam could be established again yesterday evening. The peak luminosity is around 1.1×10^{34} for (only) 1800 bunches.

TI

J. Nielsen reported on last weeks main perturbations.

It was a rather busy week with quite a few electrical perturbations, two on Wednesday and one early Thursday morning.

On Saturday at 11:32 the cooling towers stopped in the North Area and were restarted quickly by TI with CV on the phone. Agreed with CV to leave in manual mode until Monday.

On Sunday at 21:38: There were some problems with the GPN network, which was down CERN-wide for 1,5 hours. The problem was due to an overload on the DNS server.

3. Schedule update.

B. Mikulec presented the proposed new injector schedule version 1.2b ([Annex 7](#)).



The Technical Stops in week 27 and 38 were advanced by one day. The start of the COLDEX run was moved according to an estimate of the RP cooldown request (20 hours). The AWAKE run dates will be added in the final version.

R. Froeschl said that the exact cooldown times (probably 24h) and the December COLDEX run would be confirmed before the end of the week.

M. Gourber-Pace reminded that there is no guaranty for operational controls during the TS.

R. Alemany added that the Linac3 ion source will be changed during the September TS and will entail a 5-day ion beam stop.

The new schedule version will be presented at the IEFC.

The machine coordinators were asked to present the list of the upcoming TS activities at the next FOM.

H. Bartosik reminded that dedicated MDs are taking place tomorrow in the SPS (coast) and in the PS (PFW; perturbations to be expected for the users).

4. AOB

H. Bartosik presented the beam requests for the upcoming MDs in the LHC and injectors ([Annex 8](#)). The only specific beam that has to be prepared for the LHC that is not operational yet is a high intensity/brightness INDIV beam.

The Linac4 tunnel access door maintenance ([Annex 9](#)) was approved pending confirmation from **J-B. Lallement** due to current access in Linac4.

Next Meeting: Tuesday 27th June 2016.

Minutes reported by [JB. Lallement](#) on 22nd June.



Summary of the 14th FOM Meeting

Held on Tuesday 27th June 2017

Agenda (<https://indico.cern.ch/event/648565>)

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

B. Mikulec chaired the meeting.
The list of presence is in [Annex 1](#).

1. Follow-up of the last FOM

Minutes of the last meeting were approved.

2. Status of the machines

Linac2&Linac3

R. Wegner reported the status of the Linac2&Linac3 ([Annex 2](#)).

Linac2 had 100% availability. From Tuesday to Friday higher spark rate was observed, most probably due to hot and humid weather.

Linac3 also had a good week. A few trips of the RF generator were recorded (remotely resettable). On Thursday the temperature of the chilled water raised what triggered an interlock for a solenoid. The cooling system was regulated what fixed the issue.

Question from **B. Mikulec**: Is there any more margin for the cooling system?

Answer by **S. Deval**: No. The temperature on that day was above the design value.

Comment from **B. Mikulec**: On the last IEFC **S. Deval** gave a presentation concerning the issues and the situation of the injector cooling systems. Many of the current issues will be addressed during LS2, and certain actions will already be taken before.

LEIR

M. E. Angoletta reported for LEIR ([Annex 3](#)). It was a good week with no specific issues, apart from some elements tripping and needing TLC (ETL.BHN10-INJ, kickers ER.KRF31, ER.KFH32, ER.KFN34 on 21/06). Activities during the week:

- Linac3 MDs (19/06 and 20/06)
- ITE BPM studies (21/06 and 22/06)
- LLRF servoloop measurements (22/06)
- LLRF MD (22/06): initial setup for h=3+6 operation
- LLRF MD (23/06): initial setup by S. Hancock on cavity voltage measurement via beam + Tomoscope

PSB

A. Findlay presented the status of the PS Booster ([Annex 4](#)). It was a worse week for the PSB, availability at 95%.

On Thursday the MPS was problematic, with a thermal problem causing one of the supplies to be swapped with the spare what generated 2 hours downtime. Waiting for an update as to when the original will be re-connected. BE4.DHZ11L1 gave the machine a lot of grief during the week, with the PiPO having to intervene numerous times to try to repair it. Eventually on Friday evening the power supply was changed in the shadow of the cavity issue and it has remained operational since.

Friday evening around 19h15 the R3 C16 cavity, which is used for bunch shaping and longitudinal shaving, tripped and required the cavity specialist to intervene. After diagnostics on the surface, it required a machine access to change the amplifier, so the access process was put into motion. Slowly, at 20h30 the machine was vented for access, but it seems that all the standard IMPACTs that are set-up for such situations were de-activated for the last technical stop as usual, but they were not re-activated afterwards, as is normally the case. After a long wait for the unfortunate RF & RP specialists, the ZORA piquet had managed to get things sorted out, then after a further delay for the access system to get the updated information, they were finally granted access after 1 hour 15mins. The result was not good however, the changed tube demonstrated the same fault, and it is now expected that there is a faulty connector/socket for the tube. As this equipment is rather old and access very difficult, it will take some time to check how exactly this equipment was made and how to change the connector/socket. It took 3hrs 20mins to get through this process, so beam was back for 3 rings and in degraded mode for R3 around 23H45.

The shavers where necessary to replace the missing longitudinal shaving on certain users.

All IMPACTs have since been re-activated for PSB & L2.

Otherwise, the week was spent setting up MD beams and adjusting operational beams as required. The RF team also put the R4 Finemet back in operation as a H=2 replacement for the GPS & HRS users on Wednesday.

Once again this week, there were several periods where there weren't sufficient MD users free to do the MD program and the setting up required. It will be watched as it often delays the setting up of the upcoming beams that are required in the complex.



Comment from **C. Rossi**: The C16 problem is still not understood and is being investigated. Access may be necessary again.

Comment from **A. Findlay**: The specialist performs investigations using the zero cycle.

Question from **S. Hancock**: How bad do the beams look without R3 C16?

Question from **B. Mikulec**: It is a question for the machines downstream, how degraded is the beam arriving there?

Answer by **T. Eriksson**: It is no big issue for the AD.

Comment from **K. Cornelis**: For the time being it is quite good in the SPS, however, it might turn out to be insufficient for the MD beams next week.

Answer: We can eventually use another ring for these beams.

Comment from **A. Findlay**: The access might take longer than expected, as it was the case the last time. Can the intervention eventually wait until TS2?

After an inquiry of the FOM participants **B. Mikulec** proposed to wait until ITS2 with the intervention to minimise loss of physics time.

ISOLDE

M. L. Bonito reported the status of ISOLDE ([Annex 5](#)). 79% availability, however most of the downtime issues due to the PSB issues and accesses. There was 75 minutes downtime due to condensate water dripping on power supplies.

This week there was no physics in HRS. Target change is scheduled on Friday and beam setting up on Monday.

First HIE-ISOLDE beam delivered to MINIBALL for detector calibration. Some cavities tripped during the weekend, a normal restart worked.

ISOLDE Users

K. Johnston provided the report by e-mail:

'Last week a variety of Bi isotopes were measured by experiment IS608. This was the first collaboration between two previously independent spectrometers at ISOLDE: the windmill and the ISOLDE decay station (IDS). Alpha spectroscopy at windmill was complemented by hyperfine spectroscopy at IDS and many new results were obtained on Bi isotopes from 188 – 215Bi. The only puzzle was the apparent non-production of isotopes beyond 215Bi: 216-218Bi were seen relatively easily last year. Nonetheless, this did not affect the physics programme and the experiment was able to complete its programme.'

PS

A. Guerrero Ollacarizqueta reported the status of the PS ([Annex 6](#)). 92% availability.

- Half an hour beam downtime due to an issue with 10MHz cavities C76 and C11 and the specialist had to intervene.
- A repeater failure stopped all 200MHz during 3.5h. The intervention was carried out by RF who was already on site.
- On Tuesday the water cooling issue affecting SMH57 was solved.
- PIPO was called for a non-resettable trip on bumper 14, 40m downtime.
- PE.SMH16 tripped several times due to a vacuum interlock triggered mainly by the losses created by kicker 71 pulsing with incorrect user value. Beams affected for 2.5h.
- On Friday a problem on a NIM crate affecting the LHC beam control stopped all LHC beams over half an hour.
- Yesterday a PS patrol was done following a firemen intervention.
- Measurements on MTE emittance in SPS show almost twice the emittance in the core than in the islands. The issue is still under investigation.
- A big effort is ongoing to understand and reduce the emittance growth on LHC Indiv and LHC1 beams.
- Doublet beam was prepared longitudinally
- Wednesday MDs:
 - PS dedicated MD interrupting all beams for physics. No real improvement on the regulation could be achieved.
 - Beams slightly perturbed by the BGI MD. Signals can be measured without magnet, but is lost as soon as the magnet is switched on. BI investigating
 - New B train was successfully used for RF and POPS feedback loops.
 - Finemet cavity set-up

Question from **B. Mikulec**: Concerning the emittance growth, is there any understanding of the issue?

Answer: For the LHC1 beam this was related to a head tail instability. For LHCINDIV tunes had to be corrected.

Comment from **M. Hourican**: Concerning the fire brigade intervention, a valve broke and started smoking. The personnel alarmed by the smell called the firemen, however, they did not find it because it was hidden behind a shielding.

Comment from **B. Mikulec**: The info to also look behind the shielding should be passed to the fire brigade.

East Area

N. Charitonidis reported for East Area. In general, smooth operation of all lines with BabyMIND in T9 still checking their hardware till Sunday. In T9 and T10 the CCC operator had to search the area on Wednesday evening, as no user with patrol right was present in the area.

After a discussion it was said that patrol rights expire and that this has to be surveyed closely.



East Area Users

H. Wilkens: BabyMind detector commissioning is in progress.

nToF

F. Mingrone: Running smoothly, measurements are ongoing. Still asking for more protons and further optimization of the super-cycle.

AD

B. Dupuy reported on the AD status ([Annex 7](#)). Good availability of 90%. No problems in AD, most of the downtime due to the issues in PSB. BASE experiment restarted taking data. There was an issue with the FGC3 control of the power converters that was not allowing to swap polarity what was needed to do scans in the BASE line. It was related to a bad equipment configuration and was fixed by EPC support.

AD Users

H. Wilkens: Not so good time for ASACUSA and ATRAP because they had to cancel their beam time due to their technical problems.

ELENA

T. Eriksson reported that anti protons were finally injected into the ELENA ring, but still they were not captured. Proton source is broken again and waiting for a spare part.

Question from **B. Mikulec:** Do you plan to get more spare parts for the source?

Answer: We have spare parts. This particular one was not likely to fail therefore was not on stock.

SPS

H. Bartosik: reported the status of the SPS ([Annex 8](#)). An average week for the SPS, with 87% beam availability. Investigated and improved LSS2 slow extraction losses for SFTPRO. Ongoing work on improving transmission (not more than 92% for now). Prepared 200 ns batch spacing for the LHC including BCMS. The feed-forward on 200 MHz main RF still cannot be used because it does more harm than improvement. On Wednesday there was an MD on emittance growth in coast as preparation for crab cavity tests. LHC was warned about coasting beam tests, anyway they started asking for beam at 2PM and the MD was not completed.

In LSS2 extraction channel to the North Area the ZS cathode was found to be misaligned by 2 mm. After realignment, the losses are back to the 2007 reference value. Transmission on SFTPRO cycle is not yet optimal for high intensity beams (max so far about 92%). Optimization of trajectories from PS to SPS was done, but there is still room for improvement. H emittance of core MTE is double compared to islands (without the core losses at injection are reduced by 50%), investigations are ongoing. Intensity delivered to the fixed target experiments is ahead of schedule.

Downtimes:

- 2h for FGC update



- 2h for exchange of tube in TX1
- 15h due to injector downtime

North Area

N. Charitonidis: Smooth and stable operation. K12 was running stably, apart from a short First Line call at the end of the Wednesday MD. In H6, B6 took 4 hours to be restarted by First Line after the Wednesday MD.

North Area Users

H. Wilkens: All fine, a good week.

HiRadMat

K. Cornelis: Resuming the experiment today. There were no issues. Emittance of the standard 25ns beam was too high and the PS is working on that. There is hope it will improve.

AWAKE

No report.

LHC

No report.

TI

J. Nielsen: Nothing special.

3. Technical stop interventions

Linac2

C. Mastrostefano showed the [list of the planned interventions for Linac2](#).

Question from **B. Mikulec:** There are no very long interventions?

Answer: That is right.

Linac3

C. Mastrostefano showed the [list of the planned interventions for Linac3](#). Only 2 interventions and none of them are lengthy.

PSB

D. Hay presented the [list for PSB](#). Routine work, usual lengths for interventions.

PS

S. Mataguez presented [the list for PS](#).

The longest is the installation of cabling for the BGI, which will take 2 days.

SPS

D. Mcfarlane presented [the scheduled activities for SPS](#).

The longest intervention concerns the replacement of MBA13370 magnet, which should fit within 30h.

Alignment of TECS.51799 and TECS.51652 requires breaking the vacuum and metrology. There will be also an intervention on the lift in BA5, so all the required equipment needs to be brought down in the early morning until the lift is in operation and later accesses need to be done using BA4 or BA6.

Comment from **H. Vincke**: Radiation needs to be verified locally before approving and defining cool-down times for the magnet exchange. What about accessing the zone?

Answer: The zone will be accessed via BA2 to avoid the dump area.

Comment from **H. Vincke**: We need to repeat the same procedure as for the last magnet change during TS1.

Comment from **K. Cornelis**: As this is the aperture restriction it may be quite radioactive. The procedure needs to be eventually negotiated.

Question from **B. Mikulec**: Can you verify the levels just after the COLDEX run, when the apparatus is moved away? This would allow having a preliminary assessment.

Answer by **H. Vincke**: Yes, good point.

Comment from **D. Mcfarlane**: Last time the intervention fitted within 30h and the stop is 36h, so we can use some margin for cool-down.

Comment from **H. Vincke**: Wednesday evening time, when nobody is in the machine, is reserved for tests of the Radiation Protection robot. It is required that nobody is in the tunnel.

Question: What is the official closing time of the tunnel?

Answer: Thursday 20h.

Comment from **B. Mikulec**: We ask all persons responsible for the interventions to call the machine coordinators as soon as the jobs are finished, so hardware restart can be commenced. There are always some devices that need Piquet interventions.

4. Schedule Updates

B. Mikulec presented the version 1.2 of the [injector schedule](#) that was approved past week by the IEFC. The only unknown to this schedule was the COLDEX run.

Question: Ions to SPS are still on the plan?

Answer by **K. Cornelis**: Yes.



Schedule of beam stop before the Technical Stop for **SPS**:

1. COLDEX run:

- **Stop all beams in the SPS at 17:00 on Monday 3/7**
- Access for COLDEX at 17:30 after 1/2h cool-down time
- Stop all beams in the SPS on Tuesday 4/7 at 16:30
- Access for COLDEX on Tuesday 4/7 at 17:00 after 1/2h cool-down time
- COLDEX moved OUT (before 18:00 4/7)

2. Post-COLDEX:

- Low-intensity single-bunch MDs as discussed with H. Bartosik allowed until Wednesday 5/7 5:00
- RP survey Wednesday 5/7 at 8:00
- **Access Wednesday 5/7 from 8:30**

For **Linac2, PSB, PS, TT2** (Linac3, LEIR and AD ring not subject to any cool-down requirements):

- **All proton beams to be stopped on Wednesday 5/7 at 5:00**
 - **ISOLDE, SFTPRO, EAST, TOF beams to be stopped 16h beforehand, i.e. on Tuesday 4/7 at 16:00**
- Ion beams stop Wednesday 5/7 at 7:30
- RP survey from 8:00 to 9:00
- Access to the machines on Wednesday 5/7 as from 9:00

All subject to the current knowledge of the interventions planned in BA1.

Accesses to certain areas are only permitted on Thursday 6/7 → planning from machine coordinators to be respected.

ITS2 ends officially on Thursday 20:00, but the machines should try to restart as soon as all interventions are finished (OK from machine coordinators).

5. AOB

1. Maintenance of TT2/TFP access point YEA01.TT2=269 from June 28 08h30 until June 29 17h00. **Approved.**
2. Maintenance of PSB access point YEA01.PSB=361 from July 3 08h30 until July 4 17h00. **Approved.**

Next Meeting: 4th of July.



Minutes reported by P.K. Skowronski on 28th of June.



Summary of the 15th FOM Meeting

Held on Tuesday 4th July 2017

Agenda (<https://indico.cern.ch/event/650685/>)

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Update on technical stop activities*
4. *Schedule update*
5. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The list of presence can be found in [Annex 0](#).

The [minutes of the 14th FOM](#) were approved.

Concerning the [open action](#) on FGC power converters, **C. Mugnier** reported on the conclusion of the meeting with FGC developers ([Annex 1](#)). The new systems will include two DCCTs. Every DCCT will be equipped with a Dallas chip (similar to LHC). Every DCCT head will be checked and properly tested. The CCC will be informed every time a new DCCT is installed. A commissioning and installation procedure is being set up.

The action was closed.

2. Status of the machines.

Linac2 & Linac3

F. Di Lorenzo reported the status of the linacs ([Annex 2](#)).

It was a very good week for Linac2 with 100% availability.

The Linac3 availability was 99.4%. The few downtime were due to trips of the source RF Thomson amplifier.

LEIR

S. Pasinelli reported on the LEIR status ([Annex 3](#)).



The week was mainly devoted to studies on the ITE BPM (Calibration & Control debugging), setting up of Xe39 NOMINAL cycle (Orbit & ECooler), LLRF setting up on the cycle EARLY & NOMINAL and providing EARLY beam to the SPS for setting up.

Few faults occurred during the week: The CRF43 went in fault and it was not possible to switch the cavity back on. The spare cavity CRF41 was then switched on. Specialists found a problem on an electronic module and with 2 power supplies in the PLC. They went back on CRF43 yesterday. The vertical kicker for the tune measurements is not pulsing. Until the return of the specialist, the beam can only be excited with the damper (Chirp excitation).

PSB

JF. Comblin presented the status of the PS Booster ([Annex 4](#)).

The main problem for the Booster over the week was the issue with the C16 cavity of ring 3. An access was required Monday and lasted longer than estimated. It generated a 6 hour downtime and delayed the LHC fill by 2h30. Investigations continued on the surface, but the problem is not yet understood. As the operational beams were not much impacted, it was agreed during the last week FOM that further investigations in the ring could wait until the technical stop. For the LHC and SPS MDs of the week-end, LHCINDIV-type beams were switched from ring 3 to ring 2 to use the longitudinal shaving as usual.

Otherwise, the week was busy with lots of MDs: Finemet studies, phase noise blow-up, tune shift vs chromaticity, wire scanner prototype tests etc...

The ring3 vertical wire scanner will be replaced during the technical stop.

ISOLDE

L. Fadakis reported the status of ISOLDE ([Annex 5](#)).

It was a very smooth week for ISOLDE.

For GPS:

The new target (#605) was installed on Friday. This will be the target to deliver first RIB to Miniball.

For HRS:

ISOLTRAP is taking beam (114, 126, 128, 129Cd) since Tuesday afternoon.

The only issue was on Sunday noon when a HT FEC and a few power supplies in CA0 tripped at the same time. After a reset things returned to normal. The HRS experiment stopped on Monday midnight (was initially planned at 9 AM) because of an issue with the vacuum in the RFQ. The vacuum piquet could not be reached certainly because of a problem with cell phone coverage.

J. Ferreira commented that if the first piquet cannot be reached, the second piquet should be called.

For HIE-ISOLDE:

All 15 SRF cavities were successfully phased on Wednesday with a beam of $A/q=3.5$ and $E=6.62$ MeV/u. They were then scaled to $^{22}\text{Ne}^{6+}$ and $^{39}\text{K}^{10+}$ (in preparation for the first RIB run). The beam line was set up for $A/q = 4.0$, $E=6.6$ MeV/u. On Friday stable beam, $A/q=4.0$ and $E=5.5$ MeV/u, was



delivered to the users (Miniball). There were a few SRF trips during nights throughout the week that were easily restored by turning them back on.

ISOLDE Users

K. Johnston said that it was a good week at ISOLDE. One of the more complicated target and ion source combinations involving a quartz line (and which is very fragile) was operated very successfully to deliver neutron rich Cd isotopes to the ISOLTRAP experiment. The focus was precision mass measurements on Cd isotopes, which are important for the r-process in nuclear astrophysics. ^{132}Cd was successfully measured for the first time and this was complemented by ^{131}Cd , ^{129}Cd and ^{127}Cd . Smooth running until the failure of the RFQ on HRS, and the experiment managed to complete their program.

PS

I. Efthymiopoulos reported the status of the PS ([Annex 6](#)).

The PS was smoothly running with an excellent overall 97.1% availability.

PS delivered beams to East Area (including IRRAD), nTOF (6.8 Tp/pulse, 5.86 E18 pot cumulated over the year, corresponding to approx. 32% of the yearly planned), AD, SPS (15.7 Tp/pulse) and all varieties of LHC beams including those for the MDs since Friday 30.06. The Xenon beams from LEIR were also prepared at early (1.6×10^{10}) and nominal intensities and sent to the SPS.

On the problems side, the major events were on Thursday afternoon when the machine went down for 15 mins following a power glitch. In the same afternoon soon after filling LHC an access was given to repair the cavity C51 (~1.5h downtime). The few remaining faults during the week are below the 15min threshold, and there was a transient problem with one wire scanner stuck in the beam.

6 MDs were planned over the week, each of several sessions, in particular that of studying the machine behaviour and instabilities when approaching the integer tune. Work also continued on the MTE extraction trying to optimise the imbalances between the islands to improve the capture at the SPS in view of the later operation at higher intensities. This needs to be further looked at.

The ToF delivered integrated intensity is well on schedule.

East Area

B. Rae said that it was a very good week for the East Area.

East Area Users

H. Wilkens said the users were happy.

nToF Users

F. Mingrone said it was a very smooth week. The next experiment is being installed in EAR1 and will start after the technical stop.



AD - ELENA **P. Freyermuth** reported the status of the AD ([Annex 7](#)).

It was a good week for AD with no major failure. There were few night interventions by the PS team to solve experimental line power supply faults (First Line called). The MTG fails the PS-AD synchronization when a new super-cycle is uploaded, resulting in an empty AD cycle. While it's a known and reported issue (and hard to solve), it can represent more than 5% of the AD cycles on days with many supercycle changes.

AD Users

H. Wilkens said that the ATRAP experiment is still in cool-down period prior to the intervention.

T. Eriksson said that ELENA will be stopped for 2 weeks from next Monday for the GBAR beam line installation.

SPS

K. Cornelis reported the status of the SPS ([Annex 8](#)).

It was a rather good week. HiRadMat was finally finished on Tuesday. As there were no MDs on Wednesday the beam production for FT was good with a slightly improved MTE. Xe-ions were injected for the first time in the SPS on Thursday. They could be captured and accelerated on the MD cycle. During the weekend different beams were produced for the LHC MD. A big effort was made by the CPS to reduce the emittance on the high brightness bunch, 1.5 μm for 2×10^{11} protons. The COLDEX run started yesterday evening with high intensity 25 ns beam and is going pretty well.

H. Wilkens commented on the good performance of the SPS that directly increased the integrated intensity delivered to T6.

North Area

B. Rae said it was a very good week.

North Area Users

H. Wilkens said it was a good week for the users.

HiRadMat

B. Rae said that a new experiment was being installed.

AWAKE

There was no report.



LHC

R. Steerenberg said it was a very good week and they achieved the current luminosity record of $1.58E34\text{cm}^{-2}\text{s}^{-1}$. The integrated luminosity since the beginning of the run is 6.5 fb^{-1} . These good performances are also due to a availability above 50%.

TI

J. Nielsen reported on the power glitch that occurred on Thursday and on some access system database problems this morning.

3. Update on technical stop activities

Linac 2 & 3

C. Mastrostefano presented the list of [Linac2](#) and [Linac3](#) technical stop activities. They were similar to what was presented at the previous FOM. It is planned to close the Linac2 tunnel at 3.00 PM on Thursday and the beam should be back in the linac by 5.00 PM. As the same team is dealing with the two linacs, Linac3 will be restarted once Linac2 is running.

LEIR

R. Alemany presented the list of [LEIR technical stop activities](#).

There will be some modifications and some cabling activities for solving the ITE BPM issue. They are documented in an ECR.

PSB

J. Coupard presented the list of [PSB technical stop activities](#).

Main activities are the investigations on the R3 C16 cavity and the wire scanner replacement. The high voltage on the distributor will be pulsed in the afternoon on Thursday once the access is finished.

PS

J. Coupard presented the list of [PS technical stop activities](#).

There are no new activities with respect to what was presented at the previous FOM. The main activity being the repair of the water leak. **A. Berjillos** is replacing **S. Mataguez** and **D. Hay** as coordinator for the technical stop. **F. Tecker** added that the PFW test will take place during the RP survey.

SPS



D. Macfarlane presented the list of [SPS technical stop activities](#).

The activity list is similar to what was presented at the previous FOM. The RP survey in BA3 will take place outside of working hours. Due to the long lift maintenance in BA5, the activities taking place in BA5 were added to BA4 and BA6.

M. Gourber-Pace said that the control system will be operational for the Linac2 restart at 3.00 PM on Thursday. **C. Mastrostefano** said that considering that the linacs are the first machines to be restarted, the CO team should first come there if any intervention on the consoles is planned.

4. Schedule update.

B. Mikulec presented the injector schedule version 1.2 ([Annex 9](#)).

The HiRadMat run will be postponed by one week (week 28 to 29).

5. AOB

There was no AOB.

Next Meeting: Tuesday 11th July 2016.

Minutes reported by [JB. Lallement](#) on 6th July.



Summary of the 16th FOM Meeting

Held on Tuesday 11th July 2017

Agenda (<https://indico.cern.ch/event/652329/>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. ITS2 report*
- 4. Schedule update*
- 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 15th FOM](#) were approved.

V. Kain asked about the issue concerning AD beam request perturbations when too many changes in the supercycle. **M. Gourber-Pace** said that this is not really an issue and it has been like that since always. She will ask **JC. Bau** to present a slide at the next FOM.

2. Status of the machines.

Linac2 & Linac3

D. Kuchler reported the status of the linacs.

Both linacs had an excellent week (Linac2 100% uptime, Linac3 some resets). TS2 was finished without problems in time. The new SAIREM generator was installed during the technical stop.

LEIR

M. E. Angoletta reported on the LEIR status ([Annex 1](#)).

The week starts well with 2E10 charges extracted from LEIR. Studies took place on LINAC3-LEIR with Ecooler ON/OFF, Schottky measurements, various debuncher and ramping cavity settings. The LLRF was setup to work with the newly repaired CRF43 but after setting everything up it was discovered that the CRF43 cavity had in the meantime gone out of service again. The cavity CRF43 was back to operational state on Tuesday. After the end of the technical stop the element EI.BHN10 did not restart and remained in fault. It was quickly fixed by EPC piquet on Friday. The electronics was stuck and did not get any command through, so a local reset was needed. The LLRF was once more setup to work



with the CRF43 cavity. Beam was successfully captured and accelerated with the CRF43 but this cavity went in standby state when the unused CRF41 was switched OFF. It was not possible anymore to switch the CRF43 ON. So the LLRF was once more set to work with the CRF41 and the CRF43 was switched OFF. The HLRF experts are informed and keep working to understand and solve the problem.

PSB

G. Di Giovanni presented the status of the PS Booster ([Annex 2](#)).

It was a good week with 95.2% availability. After providing beam to COLDEX on Monday the high-intensity, high-loss cycles were stopped on Tuesday at 4pm and all remaining beams on Wednesday at 5am. Main interventions in the PSB were: Repair of ring3 C16 cavity, exchange of ring3 vertical wire scanner, powering test of a repaired BI.DIS10 module and repair of a vacuum leak in the BT line. All interventions were successful.

The main issue of the week were: Monday evening no more beam from ring 1 due to a broken CPU of the RF frontend cfv-361-allr1bc (2h30 repair time), a long-lasting INCA/LSA issues where the settings were not propagated correctly to certain equipment after cycle mapping could be solved. At beam restart after ITS2 Thursday afternoon several problems occurred with synchronization and later on with dying RF processes, related to LL-RF SW changes deployed during the TS (migration of ALLPSBDSPA, ALLPSBDSPB and ALLPSBDSPC to FESA 3). In addition the blow-up of all rings had to be adjusted after the recalibration of all C16 cavities. Operation went back to cruise speed from around 4 AM on Friday after interventions from the RF team, the LL-RF piquet and **M. Jaussi**.

ISOLDE

J. Alberto Rodriguez reported the status of ISOLDE ([Annex 3](#)).

It was a very busy week at ISOLDE, most of it dedicated to prepare and deliver the first HIE-ISOLDE beam of the year (^{72}Se at 4.4 MeV/u). A complicated radioactive molecular beam ($^{72}\text{SeCO}$) in the GPS target was generated, transported it to the REX-TRAP and the REX-EBIS where the molecules were broken and the charge state of the Selenium to $^{72}\text{Se}^{19+}$ was boosted before accelerating it to 4.4 MeV/u. On Friday evening the radioactive beam was sent to the Miniball users for the first time. The machine (specially the REX-TRAP, REX-EBIS and the REX/HIE-ISOLDE linac) was very stable during the whole week. Unfortunately, the target production rate of the molecular beam has been steadily decreasing since Friday (~a factor 2 every 12 hours) and on Monday it was too low for the users. Therefore it was decided to go for a target and Laser MD and send the beam to users for background and calibration measurements. The target will be replaced.

ISOLDE Users

K. Johnston said that it was a disappointing week at ISOLDE from the user's side. The first experiment for HIE-ISOLDE (IS597) had the aim of probing shape coexistence in ^{72}Se at Miniball. This should be a relatively straightforward beam for ISOLDE to produce, but some as-yet unknown problem with the target resulted in yields being low at the beginning of the experiment and they continued to drop over the weekend. By Sunday, insufficient production of ^{72}Se meant that the experiment effectively ended



2 days early. An early estimate from the spokesperson was that only about 3% of the experimental program was possible. Now to be checked why the chemistry of the target did not work as expected.

PS

K. Hanke reported the status of the PS ([Annex 4](#)).

All in all good week with only a few faults and an availability of 93.3%. The first part of the week before the technical stop was extremely quiet. On Tuesday beams were stopped for the 36 h technical stop. Access started on Wednesday with the RP survey followed by the various interventions. All planned interventions were completed timely. The PS was closed on Thursday 15:00, followed by the patrols. The Power and Kicker Piquets were needed to start some of the equipment. Beam was taken as from 19:00 slightly ahead of schedule but the PSB had still some RF problems. The only major fault of the week was a stop of the EAST beams for more than 6 h on Friday due to a faulty power supply, fixed by First Line. The PS was not affected by the power glitches during the weekend. However there was a fire alarm in b.151 on Sunday (some electronics burnt in the power rack of the 24 kV final amplifier for PR.C40-77). On the beam preparation side, a 12b BCMS with 160E10 ppp was set up for the LHC on Sunday morning.

East Area

B. Rae said that apart from the power converters fault. It was a good week

East Area Users

H. Wilkens said that the users were happy.

nToF Users

F. Macina said that nToF ran smoothly.

AD - ELENA

L. Bojtar reported the status of the AD ([Annex 5](#)).

The AD ran quite well, although the start-up was a bit problematic after the technical stop. Beam came from PS at 10 PM as planned, but it was delivered to AD experiments only at 2 AM, due to 3 different problems. The injection kicker timing had to be adjusted because of some HW change during the TS (this was expected). Ejection timings were missing due to a modification made for Elena during the TS. And there was an orbit jump (it happens generally after the e-cooler drops or an access is given to the ring). The BASE and AEGIS experiments asked then to re-steer their beam line.

ELENA is in transfer-line installation phase.

AD Users



H. Wilkens said that the ATRAP experiment being still warm, beam was rescheduled to AEGIS and ALPHA experiments.

SPS

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

The week was rather smooth with excellent beam availability of 95%. The North Area beam was stopped as planned on Monday evening for a 24 h dedicated run for COLDEX. The cool down time before the technical stop was used for MDs with low intensity single bunch coasts (crystal assisted slow extraction and emittance growth studies in Q20 optics). Some issues were encountered after the 36h Technical Stop on Thursday evening. About 1 h downtime was caused by a problem on a few TT10 magnets which tripped and could eventually only be restarted by the Piquet. Furthermore, there was a problem with the intensity on the T2 target despite the fact that the transfer line trajectory had not changed as compared to before the Technical Stop. Eventually it was found on Friday morning that the target intensity monitor TBIU had lost its reference position in the FESA class and therefore was offset by 25 mm. Until that moment the North Area beam was delivered with reduced intensity to the other targets. An aperture scan performed on Friday confirmed that the exchange of the dipole MBA13370 during the Technical Stop indeed resolved the aperture bottle-neck in location 133.

L. Jensen commented that the fault on the TBIU should not be assigned to the BI group but to the EN/STI as it is not an instrumentation problem. **V. Kain** answered that fault are not assigned according to groups but to systems. This can be further discussed.

J. Ferreira asked whether the aperture restriction in 133 was understood. **K. Cornelis** answered that there was no clear clue as nothing clearly visible.

North Area

B. Rae said they had a difficult restart on T2 but it went well once intensity issue was solved. T4 and T10 were suffering from transmission degradation. Investigations on the cause were on-going.

North Area Users

H. Wilkens said it was a very productive week-end. A field mapping of the GOLIATH magnet took place during the TS. It was a bit tricky as it was the first time the magnet was powered. Users are happy.

HiRadMat

B. Rae said there was nothing special to report.

AWAKE

There was no report.



LHC

K. Cornelis said the LHC was restarted on Saturday after the technical stop.

TI

J. Nielsen reported on the week events.

On Saturday the chilled water distribution stopped for NA61. TI was notified by the users since no new alarms were active. Alarms were already present because of a maintenance on-going on the other pump. The pump tripped due to the high temperatures in the hall. 2 hours later the chilled water and pumps on the production unit for NA61 tripped again. It was still very warm in the hall. The doors were opened wide, to let more air circulate.

During the night from Saturday to Sunday an electrical perturbation tripped the SPS.

On Sunday there was a fire alarm in the PS. PS operator confirmed a problem with a RF cavity in building 151 at the same time. There was an Intervention with fire brigade and electrical power supply was consigned.

3. Report on ITS2

Linac 2 & 3

C. Mastrostefano said that everything went well with Linac2 and Linac3. Beam was back at 16.00 on Thursday. The vacuum intervention on the first DTL tank could not be completed. The L3 source new SAIREM generator was commissioned.

J. Ferreira commented that a leak was found on the secondary vacuum of intersection of tank 1. Due to the short distance between drift tubes at the beginning of the LINAC this leak is not accessible to repair, but it was reduced. The objective of this secondary vacuum is not to mitigate a leak but to avoid the progression of the corrosion found. As an alternative solution a tube was prepared to install a N2 bottle close to the RFQ (out of the tunnel) to keep the corroded volume under N2 atmosphere. The position of this bottle needs to be agreed.

LEIR

D. Nicosia could not be present at the meeting. He sent a mail saying that everything went fine.

PSB

A. Berjillos Barranco reported on the ITS2 for the PSB ([Annex 7](#)). Everything went well. The C16 was repaired and the wire scanner replaced.

PS



A. Berjillos Barranco reported on the ITS2 for the PS ([Annex 8](#)). As already mentioned by **K. Hanke** in the PS report, everything went well.

SPS

D. Macfarlane reported on the ITS2 for the PS ([Annex 9](#)). There were half the number of intervention usually planned for a technical stop (certainly due to the proximity of the previous one). The BA5 lift maintenance did not take place because the team did not get the correct access rights. It is reschedule to the next TS. The magnet was successfully exchanged in 133 but there was an accident during the transport and a staff got injured. The event is being followed-up by HSE. Several doors were forced without permission.

4. Schedule update.

V. Kain presented the injector schedule version 1.2 ([Annex 10](#)).

There will be a dedicated MD in the SPS tomorrow. The LHC MD beams requirements will be discussed next week.

5. AOB

The maintenance of the AD door YEA01.ADT=853 (13/07 to 14/07) was approved.

Next Meeting: Tuesday 18th July 2016.

Minutes reported by [JB. Lallement](#) on 13th July.



Summary of the 17th FOM Meeting

Held on Tuesday 18th July 2017

Agenda (<https://indico.cern.ch/event/653667/>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Schedule update*
- 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 16th FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

G. Bellodi reported the status of the linacs.

Both linacs had a very good week. Linac2 had 100% beam availability. For Linac3, only a couple of source resets were needed and there was an intervention to exchange a MEFT quadrupole power supply module.

LEIR

S. Jensen reported on the LEIR status ([Annex 1](#)).

It was an eventful week for the LEIR. On Wednesday, there were few issues with quadrupoles and they had to switch again from the CRF43 to the CRF41 cavity (expert investigating). On Friday, powering cables of ITE.BHN30 and ITE.BHN20 were found cracked and LEIR was then switched to standby mode over the weekend. Cables were replaced on Monday.

L. Germain-Bonne said that they would require a 10 minute visual inspection of the cable during the week.

PSB

V. Forte presented the status of the PS Booster ([Annex 2](#)).



It was a very good week with 99.8% availability. The tune measurement issues on R1 and R2 were solved. The residual noise on the BPMs in the BTP line will be investigated by BI during the next technical stop. The increase of activation at BHZ52 is not explained yet and moving a BLM closer to the area would certainly be necessary to get a better understanding. The new BPM system is under commissioning. There were recurrent issues with the R3V and R2V wire scanners. **A 1 hour intervention is needed for the R2V** (to be scheduled). The BCMS 1.5 eVs beam is being prepared. The list of the different MDs performed over the week was given.

ISOLDE

E. Siesling reported the status of ISOLDE ([Annex 3](#)).

It was another very busy week at ISOLDE. With the production rate of the radioactive molecular beam $^{72}\text{SeCO}$ being too low to continue the run last week it was decided to do an (unplanned) target change. On Wednesday morning the new target was clamped onto the GPS front-end.

The complicated radioactive molecular beam ($^{70}\text{SeCO}$) is generated in the GPS target, transported to the REX-TRAP and the REX-EBIS where the molecule is broken up and the charge state of the Selenium boosted to $^{70}\text{Se}^{17+}$ before accelerating it to 4.5 MeV/u in the REX and HIE linac. By Thursday evening the radioactive ^{70}Se beam was sent to the Miniball users.

Overnight they then saw a large amount of Germanium contaminant in the beam ($^{70}\text{SeCO}$ and ^{66}GeS are at the same mass) and Miniball decided to change to ^{66}Ge instead with the ^{66}GeS beam being as exotic as the original $^{70}\text{SeCO}$. The radioactive $^{66}\text{Ge}^{16+}$ is being sent to the Miniball experiment since Friday afternoon.

The machine (specially the REX-TRAP, REX-EBIS and the REX/HIE-ISOLDE linac) has been very stable during these days. Small hick-up of the IHS RF amplifier in the REX linac part and an issue with the isolating transformer for the GPS HT platform (target heating went down) apart from very few RF amplifier trips and the line heating going down once.

The target production rate of the molecular beam expectedly decreased since Friday (to a factor 2 this Sunday evening), but with some re-optimizing over the weekend the number of particles per second seen at the experiment was brought back up. The Miniball users are very happy.

ISOLDE Users

K. Johnston said that the second HIE ISOLDE run was more successful than the first. The beam of interest was ^{70}Se , but for the second week in a row, the production of this isotope was low. There are some technical issues yet to be understood about why Se beams are apparently so difficult to produce now, when they were relatively strong a few years ago. Although ^{70}Se was weak, a comparatively strong ^{66}Ge beam was seen, which had neither been studied nor post-accelerated previously. This isotope displays many of the same properties as ^{70}Se – such as shape coexistence – and the physics program was adapted accordingly. Coulomb excitation of this isotope ran from Friday till Tuesday morning. The users are pleased with the data collected and appreciate the excellent efforts of all the ISOLDE technical teams from operations to the target team ensuring that the second (unplanned) target was produced and put online to allow the experiment to happen.



PS

I. Efthymiopoulos reported the status of the PS ([Annex 4](#)).

It was a very good week with 99% availability. The list of produced beams and MDs performed over the week was given. The only three blocking faults were related to the quadrupole F16.QFO215 and to the C76 cavity. The nToF delivered integrated intensity is well on schedule.

East Area

J. Bernhard said there was nothing special to report.

East Area Users

H. Wilkens said it was a very good week with a record integrated intensity thanks to the very good availability of the PS. Users in T9 have completed their 6 week run and will move out of the beam line today.

nToF Users

F. Macina said that everything went fine. Thanks to a relaxed cool-down time, they will profit from 2 additional physics weeks at the end of the year (draft program to be approved).

AD - ELENA

L. Jorgensen reported the status of the AD. It was a very good week. The intensity was degraded due to an issue with the stochastic cooling, which was not optimum. On Thursday the cryogenic current comparator went down. **A 1 hour stop will be required for investigations.**

The ELENA extraction line to GBAR was being baked out and it induced a pressure increase in the AD such that the valves around sector 3 had to be closed. They will see if it entails a lifetime decrease of the H-.

AD Users

H. Wilkens said that the ATRAP experiment is still warm (cool-down expected towards the end of the week). Beam time this week was rescheduled to ASACUSA and ALPHA.

SPS

F. Velotti reported the status of the SPS ([Annex 5](#)).

The availability was 83% over the week and mainly influenced by the fault on the 18 kV (22 hour stops) and many short faults on the RF. The 18 kV fault induced damages on the SMD12 bucket network that was repaired by EPC experts on Wednesday night. The issue with the XTAX.021-023 that



was stuck caused a reduced intensity for the whole Tuesday night for T2 and NA beams. The list of performed MDs was given.

North Area

J. Bernhard reported that portable ODH/CO2 detectors and two persons are now mandatory for patrols in PPE132, PPE142, PPE152, PPE124, and PPE148 (all in EHN1), see [EDMS 1827690](#). He then thanked the SPS-OP team for the better steering on the splitters and T4 where losses led to a background outside of the useful spot on T4. This led to a lower transmission towards the T10 target, which is now back at the expected value.

North Area Users

H. Wilkens said that even if less good than previous ones, it was still a good week.

HiRadMat

There was no report.

AWAKE

There was no report.

LHC

Karel said it was a difficult week for the LHC. The issue with the RF coupler is now more or less understood. They were starting intensity ramp up. The LHC was off all day yesterday due to a short circuit on temperature sensor electronics.

TI

R. Ledru said that the main problem of the week was the 18 kV fault with the electrical breaker "EMD212/BE", which prevented the restart of the SPS and LHC. After 24H of investigation, a wire was found pinched inside the breaker.

3. Schedule update.

B. Mikulec presented the injector schedule version 1.2 ([Annex 6](#)).

The LHC MD2 block is scheduled on next Monday-Tuesday. There is this week a dedicated MD in the SPS (no beam to the NA). **D. Macina** said that they will perform calibration in nToF tomorrow from 9.00 to 16.00 and will therefore not request beam during that period.



As the 1 hour stop for the AD and the PSB is not urgent, it will be scheduled on short notice whenever another machines have unexpected downtimes.

4. AOB

The [beam request for the LHC MD](#) was provided by **M. Solfaroli** (only standard beams).

The maintenance of the access point YEA01.SWY=151 from Wednesday 19/07 - 08.30 to Thursday 20/07 - 17.00 was approved.

Next Meeting: Tuesday 25th July 2016.

Minutes reported by [JB. Lallement](#) on 20th July.



Summary of the 18th FOM Meeting

Held on Tuesday 25th July 2017

Agenda (<https://indico.cern.ch/event/655432>)

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](#).

1. Follow-up of the last FOM

Minutes of the previous meeting were approved.

2. Status of the machines

Linac2&Linac3

R. Scrivens reported the status of the linacs ([Annex 2](#)).

Linac2:

- ~99.6% availability
- On Monday an issue with a pulse repeater caused incorrect BCT acquisition, leading to the Watchdog continuously cutting the beam. CO was asked to clarify to us the call procedure (Timing? Hardware?)

Comment from M. Gouber-Pace: The call procedure applied on last Monday was right: OP called the FE Operational support (BI) who diagnosed a timing problem; at this stage, BI had no means to guess if the problem was on the generation or on the reception side. It was then logical that he called a timing expert. This one was able to identify the root cause of the problem (misbehaving HW) and advised OP to call the INFRASTRUCTURE support team. As you correctly outlined, INFRASTRUCTURE was NOT the right qualifier, the expert should have used the term 'HW INSTALLATION' team.

With the new pulse repeater generation (installation has started in some places and will reach its apogee in LS2), the diagnostic tools will allow the FE operational support (in this case BI) to identify the root cause of the timing issue and then to call either the timing team if the problem is generation-related OR the HW installation team if a HW module is faulty.



- After LS2 there will be additional diagnostics, so discrimination if source or reception is faulty will be immediate.
- A high source flashover rate (23/day) is being correlated against environmental conditions. If there is a stop, inspections will be made.
- RF phases could not be controlled after a FESA update. Fixed.
- If there is a 1 hour stop RF will exchange the reference line amplifier that has shown some fault conditions; it's not urgent.

Linac3:

- 94% availability.
- Poor transmission after the linac was traced to the RFQ tube failing, which was replaced on Wednesday (3 hours down in total)
- RF phases could not be controlled after a FESA update. Fixed.
- At the moment a 2 hours stop to change the FJ amplifier on tank2.
- Xe gas is getting low, but waiting longer to replace.
- Four trips of the source RF in the week. The spare is being prepared in situ, as the controls need to be better integrated before it would be used operationally. Will then require a day to retune the source. In preparation (date ready not yet known).

LEIR

N. Biancacci reported for LEIR: ([Annex 3](#))

Issues:

- On Monday recovery from BHN20/30 re-cabling procedure. Beam only in the afternoon for joint LEIR/LINAC3 MDs. Difficult restart, needed to exchange module in EI.QDN10 PC.
- On Tuesday unusual injected intensity fluctuations: identified Linac3 RFQ RF tube to be changed.
- The same day a small water leak issue on RF LEIR: quickly fixed by increasing pressure.
- Few trips in LINAC3, quickly fixed, then beam to the PS for EARLY to SPS setup still with old transfer line optics.
- On Thursday fixed BPM reading in EE, ETL, ETP lines.

Activities:

- Joint LEIR/LINAC3 MDs to study the effect of ramping and de-bunching cavity on momentum distribution.
- NOMINAL cycle setup for multiple injections and e-cooler current increased from 200 mA to 300 mA to boost cooling time.



- RF studies on EARLY and NOMINAL beam: flat bunch produced in NOMINAL with $h=4$, RF voltage calibration accuracy measured down to 1% in EARLY.
- 7 injections in NOMINAL: working on injection and capture efficiency.
- EARLY to SPS.
- LLRF MD.

PSB

A. Findlay presented the status of the PS Booster ([Annex 4](#)). Availability 96%.

Issues:

- Monday 80 minutes lost due to L2 Watchdog timing issue.
- Monday 3hrs 20mins lost due to BE.SMH15L1; electro valve changed
- Friday 1hr 40mins lost due to BE2.KFA14L1; timing card changed
- Saturday 70mins lost for ISOLDE due to BTY.QFO153; fixed by First Line.
- BPM & wire scanner issues worked on throughout the week.

ISOLDE

M. Lozano Bonito reported the status of ISOLDE ([Annex 5](#)).

Working with a new isotope Ba 144, which was delivered to the MiniBall experiment. It was a good week, got the beam on Thursday while it was expected for the following Monday.

Issues:

- Several times power supply for the target heater tripped and restart was time consuming.
- Some trips of the normal conducting cavities.

ISOLDE Users

K. Johnston: Pretty good beam, this time it was as predicted, what is not often the case. This week will switch to another Ba isotope.

PS

M. Fraser reported the status of the PS ([Annex 6](#)).

It was a good week for the PS with an average availability of well over 90%. Downtime was caused by minor faults spread across a range of equipment that could be reset after piquet interventions. On Thursday morning, and with very short notice, it was agreed between with the LHC co-ordination team that an LHC 50 ns beam would be provided to help diagnose the 16L2 issue. The beam was available for SPS on Thursday afternoon. Also on Thursday the LHC ion beam (EARLY) was sent to the SPS setting up. An issue with the ion beam transmission between the machines was solved and attributed to the PS extraction equipment having wrongly scaled settings. The LHC VdM beam was tested during the week and is ready at 2.6 mm mrad at extraction from the PS. Over the weekend, the East Area was able to profit from the extra space in the super-cycle due to the SPS mains problem and could take extra spills. Work is on-going to improve the TPS15 shadowing of



the SMH16 for MTE extraction and a further iteration was made over the weekend, needing adjustment and optimisation of all other beams extracted through SS16. The MD programme was busy and the BGI magnet was successfully powered at nominal current without perturbing the beam using an additional trim circuit, which was added during the last Technical Stop.

East Area

N. Charitonidis: Nothing to report, smooth operation throughout the week.

East Area Users

H. Wilkens: A smooth week.

nToF

M. Bacak: Also smooth operation.

AD

B. Dupuy reported on the AD status ([Annex 7](#)).

Availability was 100%, however, the beam position was drifting due to instability of fine timing at the extraction kicker what affected ATRAP and ASACUSA. It seems to be related to temperature changes. A timing card in a kicker was modified and it should solve the issue.

AD Users

H. Wilkens: The experiments suffered due to the beam position fluctuations.

SPS

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

Availability of 73% due to problems with the main power supplies (dedicated presentation in AOB of this meeting). The transmission is improving after it got worse following the technical stop interventions.

Activities:

- HiRadMat experiments, ATLAS Pixel and RotColl, are almost finished. The run was stopped by the mains problem.
- Xe beam 100 % transmission from PS and acceleration through transition.
- Q22 MDs for high bandwidth feedback.
- 50 ns beams for LHC to investigate 16L2 loss problem.
- BCMS beam Sunday fill: 1.2×10^{11} ppb, 1.5 μm emittance,

North Area

N. Charitonidis: Smooth operations.



North Area Users

H. Wilkens: In H6 we had many problems with radiation alarms.

Comment from N. Charitonidis: The alarms are indeed correlated with the beam losses. Thresholds of the BLMs were temporarily increased in accordance with RP and the issue is being investigated.

HiRadMat

N. Charitonidis: Last week HiRadMat was close to perfect, thanks for the good beams delivered by the SPS operation team. The program of the experiments was almost complete, just one pulse missing for RotColl and ATLASpixel. Monday the 24th, access was necessary for successful recovery of TCDI in preparation of TDIcoat (with beam slot in 2nd week August). Aiming for another 2-3 hours of access this week.

AWAKE

No report.

LHC

J. Wenninger: The LHC finally recovered from the technical stop. Large amount of time was spent on investigation of the losses in cell 16L2 and they are still not understood. The loss rate is larger at this point, but still within the limits. Sometimes it jumps and afterwards the beam gets unstable provoking beam dumps within a few milliseconds. It seems to be related to low energy electrons. At the moment there is an MD and tomorrow there will be VdM scans. There is a new luminosity record thanks to better emittance from the injector chain.

Comment from S. Hancock:

It is a pity that nobody reported earlier on the 16L2 issue while it was observed already for a few weeks. If we knew about it we could get prepared for 50 ns beam in advance and avoid doing it in hurry.

TI

C. Wetton: Thunderstorms made a lot of equipment unstable from Friday to Saturday, but the biggest problems happened on Saturday afternoon and evening.

3. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

Currently LHC MD2 is ongoing. The HiRadMat runs that were scheduled for week 28 and 31 were both delayed by one week. AWAKE run 2 will also be delayed by one week (from week 32 to 33).



4. AOB

Q. King reported on the SPS Main Power Converter issues ([Annex 9](#)).

Glitches started on Tuesday provoking large spill intensity fluctuations. On Saturday it was identified as the active filters being switched off and on because of Profibus communication failures. On Sunday it was fixed after:

- reducing the bus data-rate from 187.5 kbps to 93.75 kbps
- enabling missing bus termination resistors in the Profibus repeaters
- replacing the master PLC Profibus interface

On Sat could not restart QF power supply fault. The cause was identified on Sunday afternoon as the loss of 400VAC for an auxiliary power supply. The circuit breaker had tripped during the storm and after re-closing, the faults could be reset. The reason it took so long is age of the equipment and missing technical documentation.

On Saturday night BEQ3 F5 Filter tripped due to current imbalance. All the capacitors were measured on Sunday morning, which identified two that had lost ~5% of their capacity since the previous measurement at the start of the year. These were replaced by spares and the SVC was restarted at 17:30. The replacement was complicated because the spare capacitors are a different shape, so extra-long bolts and additional nuts had to be used.

The intervention was complicated due to multiple unrelated overlapping issues – there were several minor issues not mentioned in this presentation that still took time to resolve.

1. Concerning the glitches, the CIS PLC software will be upgraded to make it more resilient to occasional communication failures – this will be deployed in the next TS, if it is ready in time. The CIS is nearly 20 years old. Some components were already consolidated in LS1, but not the Profibus interfaces or repeaters. This will be planned for the YETS. Profibus links between the SPS buildings used free pairs of existing unshielded multi-core cables. These do not conform to the Profibus standard and may contribute to the communication errors. Replacement by dedicated Profibus cables will be studied.
2. Concerning the QF spurious faults, much of the control and interlock electronics in the SPS main power converters is original, dating from 1973-75. Documentation will be improved so any similar pattern of faults in future will be quickly traced to this power supply. Consolidation of the controls electronics is planned for LS2, provided there are sufficient resources. Since LS1, the QS converter cannot seamlessly replace QF or QD without major retuning of the functions.
3. Concerning the SVC trip, the spare SVC (BEQ1) is so old and fragile that attempting to restart it takes more effort than repairing minor issues with BEQ2 or BEQ3. This will be resolved in LS2 with the replacement of BEQ1. The SVC repair was delayed by more than



an hour by the spare capacitors being a different size. The procedure and material needed to handle this will be prepared to avoid this additional delay in future.

Question from B. Mikulec: Can the Profibus communication also be monitored?

A.: Yes, it is also in the plan to implement it.

D. Chapuis requested maintenance of TFP access point YEA01.TFP=801 from July 26 08h30 until July 27 17h00 ([Annex 10](#)). **Intervention was approved.**

Next Meeting: 1st of August.

Minutes reported by P.K. Skowronski on 26th of July.



Summary of the 19th FOM Meeting

Held on Tuesday 1st August 2017

Agenda (<https://indico.cern.ch/event/656392>)

- 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](#).

1. Follow-up of the last FOM

Minutes of the previous meeting were approved.

2. Status of the machines

Linac2&Linac3

R. Wegner reported the status of the linacs ([Annex 2](#)).

Linac2 availability was 97.1%. Tank 2 amplifier had to be changed (3h downtime) as well as amplifier of DB10 (2h). Spark rate at the source was higher this week and counted 75 sparks. The reason is not understood.

Question from **B. Mikulec**: Do you plan to do some more investigations?

A.: All the known sources of the sparking were verified OK.

Question from **B. Mikulec**: During the next stop do you plan to do some local investigations?

A.: The investigations will be continued. There are some ideas and new measurements that are planned.

Linac3 was running quite well with 98.8% availability. An amplifier tube was exchanged that took 1h. Another tube exchange is in preparation. There were a few trips of the source RF system. The source and LEBT was retuned what gave more beam current and much less current jitter.

LEIR

S. Jensen reported for LEIR ([Annex 3](#))

Availability was 80%, but it was only due the Linac3 issues.

Activities:



- Tue: NOMINAL study: inj. eff. optimization
- Wed: NOMINAL study: quality of multiple injections
- Thu: NOMINAL study: e-cooler setup (high losses @ 2nd injection)
EARLY to SPS for RF setup
- Fri: EARLY to SPS for RF setup

PSB

B. Mikulec presented the status of the PS Booster ([Annex 4](#)).

Good week for the booster with 96.4% availability. Main downtime:

- Linac2 problems on Wednesday night.
- PS switchyard access
- Several resets for extraction and recombination kickers

Beams:

- All operational beams available
- Van der Meer beam prepared for LHC
- 2 dedicated cycles set up for ISOLDE beams with Finemet cavity for h=1 or h=2 replacement
- MD cycle prepared for h=2 user with h=1 synchronisation; first tests done in PS
- BCMS 1.5 eVs cycle has been optimised and is available for dispersion matching and transverse blow-up studies at PS injection

Since Thursday running Linac4 24/7, babysitting and fault follow-up by PSB operators and Linac4 ABP team.

ISOLDE

E. Matli reported the status of ISOLDE ([Annex 5](#)).

Smooth operation with 95.4% availability. On Thursday, the source gave up and the run had to be interrupted. Another major issue was an RF FEC that had to be locally power cycled. New targets are installed and ISOLDE is ready to restart.

ISOLDE Users

E. Matli: The 144Ba run was successful. Ba142 run was interrupted and now the experiments are preparing for Sm measurements. HRS is delivering 35Ar to VITO experiment.

PS

M. Fraser reported the status of the PS ([Annex 6](#)). Average beam availability 93.4%. Setting-up LHC BCMS 1.5 eVs. For R3 there is blow up at injection (C185), 100% in H and 40% in V.

Faults:

- Recurrent faults with PR.WFW due to a communication problem between FGC and VS state card. FGC will be changed during next beam stop.
- SMH16 electro-valve (replaced)

- RF 10 MHz cavities: C56/C86
- KFA45 tripped on maximum voltage

Over the weekend LHC reported satellites. Immediate mitigations:

- Tightened extraction kicker (KFA71) pulse around the batch.
- Second instance of kicker used to clean satellites after triple splitting.
- Losses seen at 26 GeV in PS (SS99) as machine ramps down.
- Fine-tuned KFA71 pulse with SPS (with second instance OFF).

Next steps:

1. Check/improve splitting, as 10 MHz RF system was not performing nominally over the weekend, but no obvious correlation with satellites.
2. Check implementation of second instance of KFA71 on 2.5 GeV intermediate flat-top: SPS reported that bunches were touched over the weekend.
3. Using PS internal dump after extraction, before machine ramps down, is an option.

The nTOF beam is still ahead of schedule. The nTOF beam was steered to be centred on the MTV screen, but this made the neutron rate drop, so it was brought back to the old settings.

East Area

N. Charitonidis: Nothing special to report.

East Area Users

H. Wilkens: Happy users.

nTOF

F. Mingrone presented the status of nTOF ([Annex 7](#)). There was an issue with the beam steering (reported above in PS section). Conclusions:

- Significant effect on the neutron beam of EAR2 (i.e. neutron production per proton pulse intensity) due to the displacement of the proton beam on the target: 6-7% decrease per 5 mm shift
 - If any intervention is necessary from the PS side, it is important to communicate it in advance so nTOF can tune the data taking without spoiling the operation of the facility
 - Need few more details: distance of the screen and position of its center
 - Would it be possible to measure the position of the proton beam at the beginning of each experimental campaign (every 1-2 months)?
- Would be very interesting from nTOF side to do a complete scan on the horizontal axis to find the maximum of the neutron flux in EAR2, both for TOF and EAST beams: possible to plan during a PS MD session?

Comment from **K. Hanke:** Scans at the beginning of a run can be arranged as it is done for the ISOLDE beams.

AD



P. Freyermuth reported on the AD status ([Annex 8](#)).

It was a good and stable week at AD with 99% availability. Only 90min of machine downtime due to an RF amplifier trip. Daily extracted intensity fluctuations of ~10% (correlated to the outside temperature) are still present and are investigated.

Comment from **T. Eriksson**: For a few weeks ELENA was down for installation of the GBAR extraction line. It has finished and ELENA was restarted.

AD Users

H. Wilkens: BASE experiment is scheduled for the next week.

Comment from **M. Fraser**: Often the AD experiments reported movement of beam position. The AD supervisor trimmed the extraction kicker delay by some 100's of nanoseconds to correct the beam position. It is bizarre because the kicker is horizontal, but the movement on the target is vertical. ABT experts report stability of a few nanoseconds with respect to the extraction timing event. The expert needs to be called next time it happens.

A: There is indeed vertical position movement observed. To be followed up.

SPS

K. Cornelis reported on SPS status ([Annex 9](#)).

Availability was 90.1%. Downtime was mainly due to the injector complex problems and an issue with the power converter for the MST septa (3h46min).

HiRadMat run (Rotating Collimators) finished last Tuesday. Van der Meer bunches provided for LHC until Friday. Difficult LHC filling on Saturday (satellites due to problems with 10 MHz cavities in PS). Fixed as of yesterday. Xe ions accelerated on prototype FT cycle.

North Area

N. Charitonidis: In H2 line a collimator got stuck and as a workaround optics was adapted. Radiation monitors show sometimes 20-22 uSv corresponding to the first warning level. Still being investigated.

Question: Are there any changes in the spill quality? Are there any observations from the user side?

Answer by **H. Wilkens**: On the last users meeting the operation team was complemented.

Comment from **K. Cornelis**: The beam is drifting, which seems to be related to the power consumption of the complex. There is a semi-automatic procedure to correct for these effects. The operation team should be called whenever a degradation is observed.

North Area Users

H. Wilkens: A new super-conducting magnet in the H8 line was tested successfully.

HiRadMat

K. Cornelis: The run was completed and currently another experiment is being installed.



AWAKE

No report.

LHC

R. Steerenberg: Past week there were MD and VDM scans, which were very successful. Over the weekend there was intensity ramp-up. Now LHC is in regular physics run again. The issue with elevated losses at 16L2 is still present what occasionally provokes beam dumps.

TI

C. Wetton: Nothing to report.

3. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

Question: Any remarks concerning the MD tomorrow?

H. Bartosik: There will be no beams to the North Area.

Question from T. Eriksson: Will the AD beam also be affected?

Answer by **H. Bartosik:** No, but it might be that it will be slightly less frequent.

AWAKE and HiRadMat runs need to be moved to one week later on the schedule. Otherwise nothing special for August.

4. AOB

No AOBs.

Next Meeting: 8th of August.

Minutes reported by P.K. Skowronski on 2nd of August.



Summary of the 20th FOM Meeting

Held on Tuesday 8th August 2017

Agenda <https://indico.cern.ch/event/657912/>

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule update*
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 19th FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

JB. Lallement reported the status of the linacs ([Annex 1](#)).

It was a very good week for the Linac2 with 100% availability and only one non-blocking fault. On Thursday afternoon, the intensity sent to ISOLDE was limited for 1 hour as long beam pulses entailed losses in the DTL with radiation level going above the first alarm level at the control room and at the PAD. It was caused by some of the tank1 quadrupoles current ramping down before the end of the pulse. The reason for this timing change was a power converter current flat top length reduction due to high temperature. The evolution of the flat top duration will be monitored in the coming weeks for confirmation. The power converters will be upgraded during the next technical stop in order to avoid such behaviour in the future.

It was also a very good week for the Linac3 with more than 99% availability and only two resets of the source.

D. Kuchler added that there is no way for the linac team to be informed of 1st level radiation alarm except being present in the linac2 control room at the time of the alarm. **J. Vollaire** answered that 1st level radiation alarms are treated by the RP group every morning and they then decide to take action if necessary.

J. Ferreira said there is a concern about a pumping group on tank2. An access is required as soon as possible to check it.



LEIR

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

The LEIR team continued Xe beam setting-up with the optimization of the NOMINAL cycle (multiple injections), the EARLY beam was sent to SPS for setting up and NOMINAL multiple injections studies took place (orbit adjustments at the injection, optimization on the E Cooler, adjustment of the capture of the beam). It resulted in 7 injections and 6.5×10^{10} charges.

There were few faults over the week:

The rack which contains the DSC of the DFH bump was OFF. The specialist has been called and found the "Disjonteurs" of the rack and of the start point OFF.

The cavity CRF41 went OFF and could not be reset remotely. The specialist has been called.

The beam after a NOMINAL cycle was not injected. It was found that the ejection value of the ETL.BHN10 on the NOMINAL, with the wrong polarity (291 A instead of -291 A).

PSB

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

It was a smooth week apart from a few resets and 2 short interventions of the Piquet for the ring 1 extraction kicker. An important ripple on the main power supply for the defocusing quadrupoles was observed, which seems to be due to a problem with the active filter of the spare QDE power supply, in operation since June. The specialists propose to switch back to the operational power supply this week, which will require a stop of ~ 1.5 h, also because first the electromechanical switch that allows the configuration exchange, broken during a piquet intervention in July, has to be repaired.

There were a lot MDs: $h=2$ cycle with $h=1$ synchronisation, longitudinal blow-up using phase noise, bunch flattening through triple harmonic operation on ring 0 (Finemet), emittance measurements along the cycle taking into account scattering on the wire, dispersion measurements.

F. Boattini confirmed that EPC needs a 1.5h access. They first have to identify the broken part before repairing as the diagnostic was not done yet.

ISOLDE

E. Siesling reported the status of ISOLDE ([Annex 4](#)).

HRS ran with Ar beams for the VITO experiment the all week.

On the GPS side, the week was dedicated for the preparation of the upcoming Sm run (REX/HIE) consisting in RILIS laser tuning, proton scan and yield check as well as Sm injection into Trap/EBIS to define best charge state all done in preparation of the very dense schedule for the coming week.

The week was reasonably calm except for a few issues: On Tuesday evening all vacuum sectors went down due to a short circuit created by one of the users. Normal situation was quickly recovered with help from TE-VSC (and luckily the target vacuum sectors were not affected). On Wednesday evening the HT2 high voltage power-supply broke (swapped for HT1 since GPS was not taking beam). On Thursday afternoon HT2 was repaired by TE-ABT. During the intervention all power in the HT room



were lost bringing down the target heating of both HRS and GPS and causing the CPU card of the high voltage FEC to break. BE-CO helped to replace the broken card. The power trip itself is not fully understood but suspected to be related to the repair on the HT2 (the circuit breaker seemed to have tripped when restarting after the repair). ISOLDE did not suffer from the 1 hour long Linac2 intensity limitation. During the weekend a few times (3 times in 48 hours) some of the CAO sector elements went down. A reset put them back on.

VITO is very satisfied with the running of ISOLDE. They do have a few issues with their set-up, mainly polluted crystals.

ISOLDE Users

K. Johnston could not be present at the meeting. He sent the following report:

IS601 took 35Ar to the VITO beamline last week and finished this morning. From a technical side the experiment went smoothly, ISOLDE delivered good beams with only some small downtimes. This is a difficult experiment and a lot of new data were obtained on the asymmetry of polarized Ar in a variety of crystals. The aim would be to have asymmetries of the order of 5-10% for an accurate measurement of the Vud CKM matrix element, but this has not yet been reached. The experiment will need to revise their setup to see what will be possible to realize this measurement in the future.

PS

A. Guerrero reported the status of the PS ([Annex 5](#)).

It was a smooth week with 99% availability. The main faults being related to the power converter of PR.WFW which had to be exchanged by the spare on Sunday afternoon (1h15 downtime) and the PIHLRF who was called due to a C11 fault. The piquet concluded that there is probably a piece of seal in the water cooling circuit (2h access needed but the cavity is back on).

On the beams side, all operational beams have been delivered as requested. Since Friday a new version of the BCMS beam keeping a constant bucket almost up to the 2Gev flat-top and with 10% lower emittance (now 1.5um per plane for 640e10p) is sent to LHC. One by one, operational beams are being prepared to use the new multi-harmonic source for test with SPS. The new B-train was tested on the BCMS beam. Whereas all other operational beams have seen the change of trains transparently this beam will require further study (what corresponds to a drift of field of ~1gauss was observed on the flat bottom).

East Area

B. Rae said that it was a good week for the East Area.

East Area Users

H. Wilkens said the users were happy.



nToF Users

D. Macina said it was a good week for nToF.

AD - ELENA

B. Lefort reported the status of the AD ([Annex 6](#)).

It was a very good week for the AD with 100% availability (5% in degraded mode). A large vertical instability was observed on the ASACUSA beam. As this instability disappears after few shots, it is pretty difficult to diagnose. Partial beam losses at 300 MeV were solved by reducing slightly the cavity voltage.

T. Eriksson reported that the ELENA experimental connection work was on-going. The tests of access system were performed. The DSO test is scheduled on Thursday.

AD Users

H. Wilkens said that the AEGIS beam time was rescheduled. ATRAP will take the beam instead. There is an AD users meeting in the afternoon during which the beam time rescheduling will be discussed.

SPS

H. Bartosik reported the status of the SPS ([Annex 7](#)).

The beam availability was 90% over the week. The beginning of the week was rather smooth with only minor interruptions of machine operation. Significant downtime was however accumulated in the second half of the week: On Wednesday night the beam production had to be stopped due to spurious beam dumps. After about 5 hours without beam the problem could be solved by the kicker Piquet by exchanging a faulty MKD receiver card. On Friday an issue with the pulse forming network PFN6 of the MKP injection kickers was encountered. While first only a degradation of the kicker waveform was noticed on the fixed target beam, the PFN6 broke down completely during the LHC filling preparation at lunch time. Fortunately the LHC beam could be injected with a large horizontal closed orbit bump to compensate for the missing injection kicker strength and the LHC could be filled before launching an intervention. After inspection the ABT experts found a damaged brazing and a destroyed resistor. The repair works could be completed by the early evening. In parallel to this intervention the photomultiplier tubes of the wire scanners 416 and 519 were exchanged in order to improve the signal to noise ratio. There were no major problems during the weekend.

Since Friday the BCMS beams are delivered to the LHC with about 10% smaller transverse emittances following optimisations on the PS side. The setting-up of prototype Xe-cycle for FT ions is well advanced.

J. Borburgh asked that whenever a kicker is reset a note is written in the elogbook.

North Area

B. Rae said it was a good week.



North Area Users

H. Wilkens said that the users were very happy with the pretty high duty cycle. HiRadMat will be moved to a different date.

HiRadMat

There was no report.

AWAKE

There was no report.

LHC

R. Steerenberg said that the LHC had very long fills with pretty short turn over. The week-end was excellent with 1.3 fb^{-1} accumulated (up to 0.5 fb^{-1} per fill). Investigations are on-going on the kicker heating issue.

TI

J. Nielsen said that there was no major event.

3. Schedule update.

B. Mikulec presented the injector schedule version 1.2 ([Annex 8](#)).

The HiRadMat and AWAKE runs will be rescheduled.

H. Bartosik said that there will be dedicated MD in the SPS (coast) and in the PS tomorrow (no beam for NA and no beam for PS physics).

Concerning the access requests: for the Linac2 pumping group check, the PSB QDE power supply switch 1.5 and WS repair and the PS RF cavity water cooling issue, the stop is scheduled on **Thursday from 9.00 to 10.30** (could be rescheduled in case of LHC fill). **J. Vollaire** asked all the teams requesting an access to contact RP in order to inform them on the location of the intervention.

4. AOB

Open questions on ITS3

J. Coupard presented the impact of an ITS3 shortening or cancellation ([Annex 9](#)).

It was requested at the LMC to evaluate the possibility to cancel the LHC TS2 and extend the YETS by one week (could be beneficial for the HL-LHC Crab-cavity). The ITS3 is presently scheduled on week 38 for 36 hours with COLDEX and UA9 runs preceding. A cancellation of the ITS3 would postpone the



AWAKE electron acceleration program to Q2 2018. The list of main injector impacted activities was given. There are especially PSB and PS LIU interventions that if postponed would have a serious impact on the YETS.

D. Kuchler said that the Linac3 source will be replaced during the ITS3 and that one week is foreseen to recover the ion beam out of the Linac.

J. Ferreira said that the vacuum will have to be broken for the WS change in the PSB (24 hours).

A. Bland added that the CO team needs to do regular security fix. If the ITS3 is cancelled, there will not be any security patch applied to the control system from July to the end of the year.

R. Steerenberg reminded that the COLDEX run and the ITS3 are linked. **K. Cornelis** added that the UA9 is generally used as cool down time prior the technical stops.

Next Meeting: Tuesday 15th August 2017 (Chair: **K. Cornelis**, Scientific secretary: **G. Sterbini**).

Minutes reported by [JB. Lallement](#) on 10th August.



Summary of the 21st FOM Meeting

Held on Tuesday 15th August 2017

Agenda <https://indico.cern.ch/event/659235/>

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

1. Follow-up of the last FOM

K. Cornelis chaired the meeting.

The list of presence can be found in [Annex 0](#).

The minutes of the 20th FOM were approved.

2. Status of the machines.

Linac2 & Linac3

G. Bellodi reported the status of the linacs ([Annex 1](#)).

The overall availability of the machine was almost 97% dominated by three major faults.

On Thursday (10th August) an access was scheduled in the shadow of the PSB fault for maintenance to the source HV system (2.5 h).

On Saturday (12th August), a fault of a power converter (LTB.QDW40) caused almost 2 h of downtime. The EPC piquet was called and replaced the power converter.

During the second half of the week the beam transmission was affected by frequent breakdown of the buncher (LI.BU01). The situation worsened during the evening of Saturday (12th August). The RF piquet was called but did not manage to fix the problem. The source of the breakdown is not yet identified. In the morning of Sunday there were several iterations on this issue and investigations are still ongoing. Whenever a LI.BU01 breakdown occurs, almost 60 mA are lost in the transmission (LT.BCT20).

K. Cornelis asked if stops are foreseen to investigate or fix the problem. **G. Bellodi** explained that the piquet asked for a short stop yesterday (Monday, 14th August) but the intervention did not help. Additional short stops may occur depending on the progress in the understanding of the source of the problem. **K. Johnston** commented that HRS would like to run at the beam intensity limit next week (2 μ A) and this intensity jitter can jeopardize the data acquisition.

G. Bellodi reported that Linac3 ran smoothly.



LEIR

S. Jensen reported on the LEIR status ([Annex 2](#)).

Apart from a few hiccups (mostly resettable faults) the week was very quiet. Several MD studies are ongoing.

PSB

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

The availability of the machine was 95%. In addition to the Linac2 downtime, there was a problem with the QDE power supply on Thursday (10th August, 3 h downtime). After the intervention, the current ripple on the power supply was solved. In the shadow of this intervention an access was organized to reset the R2V wirescanner (this device is now operational) and to measure the radiation hotspot around BHZ52. Preliminary analysis showed that this could be generated by the PSB R2. Investigation will continue.

On Sunday (13th August) there were 2 hours of downtime for R1 on MTE due to a fault on the LLRF frontend. Due to an ongoing issue (no alarms notified by the low-level frontend) the problem was difficult to diagnose. The LLRF piquet (responsible for the frontend) was called and restarted it. **A. Findlay** reminded that operational alarms and samplers are not available for the 4 operational FEC since the last upgrade on 6th July 2017 and urged to restore them rapidly.

K. Cornelis asked if the reduced ripple in the QDE impacted positively on the beam quality. **A. Findlay** answered that it had an effect on the tunes but there were no investigations on the impact on the beam brightness.

ISOLDE

L. Faradakis reported the status of ISOLDE ([Annex 4](#)).

The availability of the beam was 94%. In addition to the Linac2 and PSB problem, the fault time was dominated by a problem with the cryogenics of HIE-ISOLDE, induced by a level drop of the LHe in the cryo-module1 (XLL2). The problem occurred during the night between Tuesday and Wednesday (8th and 9th August). On Monday (7th August) the increase of the field in the cavity SRF05, increased the power dissipation by 3-4 W. Due to the strict margin of the regulation valve (2CV960) the system could not provide enough cooling power. The LHe level started to drop but unfortunately went unnoticed. When it reached the 8% level the LLRF amplifier interlock was raised. There is no piquet service during the night so during Wednesday morning, the cryogenic operators adjusted the upper limit of the main valve 2CV960 from 33% to 36% to increase the margin of regulation and corrected the issue with the alarm of the LHe level which was not working at the time.

Apart from the issues stated above ISOLDE delivered beam ahead of schedule.

ISOLDE Users

K. Johnston informed that it was a very good week for ISOLDE users.

The delivered beam was intense and very clean (no oxides). Few hiccups with tripping cavities perturbed the run but did not prevent to collect a significant amount of data.



PS

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

The overall PS availability was of 93.1%. In addition to the upstream machine downtime, the main issues were related to a trip in one of the Pole Face Winding converter (WFW, 1h45 downtime), to a problem with C80-88 cavity (2h30 of perturbation with degraded longitudinal characteristic of the LHC beam), a fault on the power converter of F61.DVT02 (30 min downtime for the EA beams) and a scheduled access in the shadow of the PSB access (2h3). During the access the C10-11 cooling system was regulated.

F. Tecker informed that the wire scanner 64V has the wire broken and that the Multi Harmonic Sources (MHS) RF synchronisation to PSB is being deployed on the operational beams. The nToF delivered integrated intensity is ahead of the schedule.

East Area

B. Rae informed that all lines are working as expected.

East Area Users

H. Wilkens informed that the users are satisfied with the beam quality.

nToF Users

D. Macina informed that nToF run is proceeding smoothly. During this week, a beam position scan will be requested. **D. Macina** asked to the PS team to measure and log on daily bases the position of the beam on the nToF target.

AD - ELENA

L. Joergensen reported that it was a good week for AD.

A dipole magnet was found with a wrong current value. A restart of the PLC solved the problem.

Between Thursday and Friday night (10th and 11th August) AD was switched off to allow the background magnetic measurement in ELENA.

Monday (14th August) was dedicated to MD but was perturbed from an OP7 for access. The calibration of the cryo-beam current transformer with the conventional BCT was not very successful.

In addition there was an intervention of the power supply of the injection line. **L. Joergensen** pointed out that the time to ramp the current to the nominal value is very long. This is due to the fact that the power converter controller can take only one instruction per AD cycle and can be increased only by 300 A per AD cycle (a minimum of 7 AD cycles are needed to reach the nominal current). **L. Joergensen** commented that an improvement on this aspect of the power supply would be beneficial.

R. Froeschl asked if the rate increase of losses could be related to the magnet fault issue. **T. Eriksson** recalled that this was the main objective of the Monday MD (14th August) but due to the problem with the beam setup, the investigation could not be carried out.

T. Eriksson reported that there was some progress with ELENA especially on the RF side. The commissioning is slow due the limited AD duty cycle.



AD Users

H. Wilkens informed that ASACUSA is collecting data on the pbar-He experiment. Towards the end of the month, they intend to cool and operate the CUSP experiment. Some delays are expected due to the increased demands in LHe during this transition.

SPS

F. Velotti reported the status of the SPS ([Annex 6](#)).

The beam availability was good (88%) mainly dominated by the pre-injectors. Frequent but short hiccups perturbed the beams, mainly dominated by few trips in SMD10 and SMD12.

The intensity delivered to T6 is ahead schedule. During the week AWAKE started the second part of the 2017 run. HiRadMat is ready to start for the next experiment.

Thanks to the BE-BI collaboration, a significant improvement on the bunch-by-bunch wire scanner measurement was observed.

S. Montesano asked if the problem with the UA9 interlock was understood. **F. Velotti** explained that the issue was fixed by masking the interlock.

K. Cornelis commented that it was observed a correlation between the SMD10 and SMD12 trip.

C. Mugnier recalled that SMD12 indeed seems affected by the other mains from the 16th July. Investigation are on-going but the progress is slow due to the limited statistics.

North Area

B. Rae reported that it was a good week hiccup in K12. Since Saturday afternoon many trips are affecting MNP33. Each trip can cause several hours downtime for NA62. The problem seems related to a fire cable. Investigation are ongoing.

North Area Users

H. Wilkens reported that the CMS M1 magnet, one of the supra-conducting experimental spectrometer magnet, in the H2 beam line, was successfully brought to nominal current. During the test the outlet water temperature reached 35°C. The maximum temperature allowed by the power converter is 37°C. At earlier tests this year it was not possible to bring the magnet to nominal current (only about 50%) due to insufficient cooling capacity.

HiRadMat

There was no report.

AWAKE

E. Gschwendtner informed that the AWAKE run will continue until Sunday (20th August). This week was mainly devoted to beam commissioning, in particular to the alignment of the proton beam with the laser beam.

The measurement of the bunch length is now available after the bunch rotation.



Trips in the kickers and interlocks of the Fast Magnet Current change Monitoring (FMCM) perturbed the beam commissioning causing the loss of each second shots. **K. Cornelis** commented that the expert of the kicker will be back next week. **T. Kramer** added that the kicker is getting inhibited by the FMCM due to the current tolerances set in the extraction line elements. Investigation are ongoing.

LHC

R. Steerenberg informed that after a very good start of the week, following a heating of the vacuum pipe at 80 K in the problematic section 16L2, the LHC has difficulties to recover its performance. Several dumps occurred also at moderate beam intensities. In one case a quench was also produced. The problem is presently under close scrutiny by several experts.

TI

C. Wetton reported that there is nothing special to mention on the TI side.

3. Schedule update.

K. Cornelis presented the injector schedule version 1.2 ([Annex 7](#)). There was nothing special to mention for the coming week.

J. Coupard presented the proposal to reduce the LHC TS2 from 5 to 3 days ([Annex 8](#)). This correspond to the ITS3. The impact on the TS3 was described.

The proposal is to anticipate the TS3 (presently 24h long) from Wednesday to Tuesday and to reschedule COLDEX experiment after it.

In addition, **J. Coupard** explored the possibilities to reduce the ITS3 from 24h to 12/10 h. At the moment a shorter ITS3 will impact mainly the foreseen activities of the PSB wire scanner prototype and the maintenance of the 925 sump. **K. Cornelis** observed that part of the activity of the 925 sump can be anticipated since does not prevent to deliver most of the beams and in particular can be started before the ITS3 (in the shadow of the UA9 coasts). **R. Langlois** confirmed that the intervention on the 925 sump can be managed in 24 h.

J. Coupard will present the proposal to the LMC tomorrow (16th August) for final approval.

E. Gschwendtner asked when the ITS3 will start. **K. Cornelis** and **R. Steerenberg** informed that it is expected to start from 08h00 (access on the machines). The beams have to be stopped before following RP indications. **K. Cornelis** commented that after the LMC approval additional iterations will follow to define the details of the schedule.

4. AOB

The maintenance of the access point YEA01.ISO=179 from Wednesday 16th August 8h30 to Thursday 17th August 17h00 was presented and approved.



T. Eriksson asked if the PS MD will be transparent for the AD run during next Wednesday (16th August). **H. Bartosik** answered positively commenting dedicated MDs are foreseen only for the SPS.

Next Meeting: Tuesday 22th August 2017

Minutes reported by **G. Sterbini** on the 16 August 2017



Summary of the 22nd FOM Meeting

Held on Tuesday 22nd August 2017

Agenda (<https://indico.cern.ch/event/fom170822>)

- 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](#).

1. Follow-up of the last FOM

Minutes of the last meeting were approved.

The planning of the next Technical Stop was presented and approved in the last LMC and IEFC. UA9 run will take place on September 18, before the TS on the 19th of September. The TS will be followed by a COLDEX run.

Technical Stop is scheduled to take 24h.

2. Status of the machines

Linac2&Linac3

R. Wegner reported the status of the Linac2 and Linac3 ([Annex 2](#)).

Linac2's availability was 90% and all the faults were due to RF components.

- Starting from Saturday 12 of August, Buncher 1 had missing pulses, quite frequently (6 per minute) and random. During those pulses, the entire RF pulse was fully reflected and not arriving at the cavity. A number of components of the amplifier were replaced which showed abnormalities (a number of control modules, high power directional coupler, amplifier output coupler). Furthermore, the amplifier for the master timing was replaced. Those actions cured the problem on Wednesday 12:30. Since then only 6 missing pulses were recorded in 5 days – a normal behaviour as seen over the past years.
- On Saturday afternoon, a failure of an auxiliary power supply in the RFQ amplifier stopped Linac2 for nearly 4 hours (in parallel with an PS access). The fault was hard to find since no error indicators are available in the old rack.
- On Sunday morning, a major fault of the Debuncher DB10 stopped the Linac. A number of components of the high voltage supply were found broken and have been replaced (anode



rejection filter, high voltage resistor, diode bridge, capacitor). The amplifier tube was exchanged twice, since the first tube (brand new) was faulty.

- In the night to Monday, several trips of the Buncher 1 preamplifier and the Debuncher amplifier occurred. A follow-up is ongoing.

Question from V. Kain: The issue with Buncher 1 was due to aging?

Answer: Yes.

Linac3 was running quite well. There were 2 trips of the Thomson generator. Slight beam intensity fluctuations were seen. On Thursday afternoon, the reason was found to be a small fluctuation of the rise time of Tank1. A few control modules of the amplifier were replaced. The situation improved. Nevertheless, the 2 tubes of the tank1 amplifier will need to be exchanged in the coming weeks to fully solve the problem. The beam intensity is typically between 30 and 40 uA.

LEIR

M. E. Angoletta: reported for LEIR ([Annex 3](#)).

Activities:

- High intensity MD in LEIR on August 14.
- LINAC3 MD1678 – dedicated Linac3 MD on August 15.
- HLRF MD for cavities remote control on August 16.
- BPMS MD on August 18.

Issues:

- ER.DWH11 & ER.DEH21 tripped on August 21 and could not be reset remotely. PIPO was called to fix the issue.
- Problems with high voltage stage of cavity CRF43 since August 16 (still under repair).

Excellent progress in cavity remote controls capabilities. Both cavities can now be reliably controlled remotely (ON/OFF). A much improved application program is now available (now Inspector-based) providing additional diagnostics.

LLRF switched to work with cavity CRF41 as operational cavity for the rest of the run.

PSB

G. P. Di Giovanni presented the status of the PS Booster ([Annex 4](#)). Availability was only 88%, which is mostly due to the Linac2 issues. PSB issues:

- On Wednesday morning for about 1 hour it was not possible to control the machine because of networking issues with INCA/LSA service, which were fixed by BE-CO support.
- A network glitch on Friday evening caused several equipment to trip, which needed about 10 minutes to recover.
- A trip of one of the recombination kickers (BT2.KFA20) required piquet intervention to replace a timing cable and caused about 1h45 downtime.
- During the week, minor issues with drifting vertical trajectory of the beam extracted from R1, which was always fixed by tuning the recombination septum BT1.SMV10.
- A timeout error for the WS of R3V that appeared during the week-end will require an expert intervention to reset it.



- The 3rd vertical SEM-grid shows a systematic alternate pattern in the transverse profile. BI experts were informed and they are working on it but no solution yet.

Question from V. Kain: What was the problem for the 1 h stop due to Inca?

Answer by M. Gourber-Pace (received by email after the meeting): The PSB INCA server ran out of memory. Actually, looking closer, there have been 3 similar events since 9th of August. I asked Vito and the INCA team to try to investigate further.

ISOLDE

J.A. Rodriguez Rodriguez reported the status of ISOLDE ([Annex 5](#)).

It has been a very good week at ISOLDE with little downtime due to problems of the equipment in the facility. Availability was 89% for HRS and 91% for GPS. Several important activities were conducted in parallel:

- Set-up of the HRS separator and delivery of several very exotic isotopes of Krypton and Argon to the ISOLTRAP experimental station.
- Set-up of the GPS separator and delivery of an isomeric state of ^{111}Cd to the GLM line for several solid state and biophysics experiments.
- Beam commissioning of the XT03 high energy line and initial preparations for the delivery of $^{15}\text{C}^{5+}$ at 4.3 MeV/u to the scattering chamber this coming week.
- MD: Transverse beam characterization for different breeding times.

Other than the problems with Linac2, there were some small issues with the tape station, the power converters of the HRS separator dipoles and with one of the electrostatic quadrupoles. EPC controls had to solve a problem with the field regulation of the power converter of the XT03 dipoles. An intervention to place to install a set and to replace another set of stripping foils (very quickly organized and carried out on Thursday by vacuum and BI).

ISOLDE Users

K. Johnston: HRS and GPS were running simultaneously with NORMHRS and STAGISO beams respectively. Apart from the problems with LINAC2 this worked very well. On HRS ISOLTRAP were measuring exotic noble gases ^{48}Ar and $^{98/99}\text{Kr}$. These are difficult beams with contaminants to be dealt with and low production rates (~ 100 ions/s or less). Nonetheless good data were measured on ^{48}Ar and the data of $^{98/99}\text{Kr}$ are being analysed.

On GPS Cd beams were delivered to biophysics and solid-state physics, where a wide-ranging programme ranging from the binding properties of chelators used for cancer therapy and solar cell materials were studied. Good data were obtained and the experimental teams are satisfied.

PS

H. Damerou reported the status of the PS ([Annex 6](#)). 79% availability the PS was well below an average week. The major part of the downtime was however due to two faults of Linac2, amounting to in total about 20 hours.



- No beams could be transferred from the PS to the SPS any more on Tuesday morning and a cable for the warning timing PEX.WSPS was found cut in building 354.
- During the first half of the week the injection septum was not pulsing on rare occasions. This problem disappeared once additional timing pulse repeaters were installed on Tuesday afternoon.
- On Thursday morning, a trip of the modules 10 to 12 of KFA71 (SS79) caused a vacuum spike. An access for a short inspection of KFA71 was organized later that morning which caused in total 1h50 downtime for all users. Module 12 (SS79) will stay disabled until the injector technical stop in September.
- On Friday, the operations team found that the interlock that should prevent the TOF bunch from being extracted towards EAST did not work anymore. This was apparently due to a bad contact in the distribution of the dump trigger timing (PX.SD48TRDC), as local investigations by the BE-CO specialist fixed the problem.
- For all beams 2h30 and for the MTE beam 2h30 more were lost due to a failure of one magnet of the octupole family PR.ODE. An access was necessary on Saturday and the magnet piquet identified insufficient water flow due to a valve in the ring not fully opened for the magnet in SS50.
- The operational MTE beam for the SPS has been migrated to the production scheme using new multi-harmonic RF sources on Thursday. Apart from minor fine tuning in the SPS, this has been largely transparent. Also, the TOF and EAST beams were tried with this new production scheme, but the users decided to keep the standard cycle to complete a long series of data taking. The migration is now scheduled this week.
- LHC-type beam with 25 ns bunch spacing was delivered for Q22 studies in the SPS with an intensity of more than $1.7E11$ ppb and excellent longitudinal parameters.

Comment from **M. Gourber-Pace**: Concerning the cut timing cable: 7 control cables were found cut and so far nobody admitted to it.

Question from **H. Damerau**: What are the prospects of the LHC 8b4e? It was tested OK in the PS, still several verifications need to be done.

Comment from **K. Cornelis**: During the LHC OP meeting this morning, there was a new idea to try the 8be4 beam in the LHC. It is therefore very likely that it will be requested very soon. On SPS side we would like to finish the ongoing HiRadMat run before moving to 8b4e.

East Area

B. Rae. Stable running for all users (T8, T9, T10) apart from a few resets on ZT10.QDE5.

East Area Users

H. Wilkens: Good week.

nTOF

F. Mingrone: The dedicated and parasitic beam for nTOF will be put on the new RF control system starting from this Wednesday (tomorrow) morning. From Friday 25/08 to Monday 28/08 morning



there will be a calibration run changing the position of the proton beam in the target to maximise the neutron vs proton ratio. For this, it is required that the BPMs in TT2 are logged in Timber for TOF, EAST1 and EAST2 beams. Regarding the data taking, the week was smooth (no major issues from the poor availability of the beam since we are above the scheduled protons on target). The experiment in the second experimental area (EAR2) will end on Thursday, while in EAR1 the same experiment will continue.

AD

Bruno Dupuy reported on the AD status ([Annex 7](#)). Availability was 86%. Activities and issues:

- Monday 14:
 - Access for intervention on BCCCA (Beam Cryogenic Current Comparator version A).
 - Transformer DE.BCT7049 calibration, the value was wrong more than 10%.
 - Optimisation of FTA line (before the target) without relevant effects.
- Tuesday 15:
 - DR.QUAD-TRIM3 was malfunctioning, the power supply did not follow the signal generator. Fixed by First-Line local reboot.
 - The Power-Supply DR.BHZTR48.49 switched between zero and the set value every 10 seconds.
- Wednesday 16 was dedicated to the injection of antiprotons from AD to ELENA. During scrapers MD, lots of micro-channel plates (MCP) detector studies for future beams profile measurement were made.
- Thursday 17:
 - Cavity C02 down due to broken cable on the resonator (AVR), fixed by the specialist.
 - The fast pulsed convertor (MegaDiscaP) DI.BHZ6045 went down. It's very long to restart as only one command can be sent by AD cycle (113 sec). Furthermore, the ramp rate is limited to 300 Amp by cycle so a restart takes (12 x 113 sec) more than 22 minutes for a simple RESET.
 - The BASE experiment did not receive the trigger on the BTV, a specialist fixed this issue.
 - Very bad beam, many instabilities during the ALPHA night shift. The extracted beam fluctuated between $2.5E7$ and $1.4E7$ antiprotons. The injection power-supply DI.QDE6010 showed significant variations in acquisition which disappeared after a reboot.
- Friday 18 dedicated to the injection of antiprotons from AD in ELENA to improve RF capture.

The extraction intensity was not satisfactory. The settings of the FTA line (before the target) are not at nominal. Continuous adjustment is requirement. The problems of the injection CPS chain contributed to this instability.

AD Users

H. Wilkens: The BASE experiment had only 2 anti-Hydrogen atoms in their trap, they used a shift last week to refill the experiment.



Concerning the situation with the liquid He for the AD experiment. As the ALPHA experiment is warming up this week, there are enough resources to cool the ASACUSA-CUSP experiment this week. For the week of the Jeune Genevois, the cryolab agreed to work over the holiday. The situation will remain tense as from September. The experiments are requesting up to 24 dewars per week, with a total capacity of the cryolab of about 25 dewars.

SPS

K. Cornelis: reported ([Annex 8](#)).

- AWAKE operation continued, interleaved with frequent LHC filling, which was in a semi scrubbing regime.
- In the beginning of the week there was some trouble with the mains (SMD10 and SMD12). After a second iteration of repairs everything was perfectly running as from Tuesday evening. The only trip of the mains since then was Friday afternoon caused by a thunderstorm and without damage.
- On Wednesday, the commissioning of the Q22 cycle continued and, on the ship cycle, studies were done with damper noise assisting the slow extraction.
- On Thursday, an orbit change was discovered due to the sinking of a quadrupole (5.23). During a short access a support was installed to stop the sinking.
- Several hours were lost for fixed target on Saturday because of a failure of the MTE octupoles followed by a problem with the RFQ.
- On Sunday, a long stop was caused by the LINAC source followed by a problem with a distributor kicker.
- HiradMat run started yesterday with up to 144 bunches. This is a really stressing beam because of the intensity. There are some issues with tune trims for this beam currently.
- There are many MKP prepulses missing in the current mode of operation (by design) and in such case the MKP is discharged through a resistor. This is wrongly counted as erratic events and causes interlock action.

Comment from T. Kramer: Indeed, it should not be counted as erratic events and it will be fixed during next Technical Stop.

North Area

B. Rae: Good week. Following the suppression and later repositioning of a fire-cable in the power converter (there is redundancy) MNP33, the NA62 spectrometer magnet, has been stable. The cable will be replaced by a new one as soon as possible during a dedicated Wednesday MD.

North Area Users

H. Wilkens: Overall a good week, however the NA62 experiment reported issues with the spill quality (50Hz ripple) Tuesday to Wednesday last week. This was due to a problem on the compensation monitoring.



HiRadMat

Just started, nothing to remark yet.

AWAKE

No report.

LHC

No report.

Comment from **K. Cornelis**: They have still issue with the losses on 16L2. As mentioned before, it is very likely that they will ask for 8b4e soon.

Comment from **S. Hancock**: There should be someone present from LHC to warn us as early as possible and to avoid beam setup in a big rush.

TI

J. Nilsen: Despite some cooling related issues at the start of the week and a power glitch on the 400 kV on Friday end of the afternoon, the week was good. On Wednesday there was an instability in the NA cooling system, a restart solved the issue. On Thursday the Meyrin demineralized water station stopped due to a faulty protection relay.

3. Schedule Updates

V. Kain presented the latest version of the [injector schedule](#). Next Technical Stop will be on 19th of September.

Tomorrow there will be an Injector MD.

Comment from **H. Bartosik**: There will be no beam to NA during the MD time in the SPS due to scheduled interventions in the NA.

4. AOB

No AOB's.

Next Meeting: 29th of August.

Minutes reported by P.K. Skowronski on 23rd of August.



Summary of the 23rd FOM Meeting

Held on Tuesday 29th August 2017

Agenda (<https://indico.cern.ch/event/fom170829>)

- 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](#).

1. Follow-up of the last FOM

Minutes of the previous meeting were approved.

2. Status of the machines

Linac2&Linac3

R. Scrivens reported the status of the Linacs ([Annex 2](#)). A very good week for Linac2 with 99% availability. On Monday night problem with preamplifier of buncher, fixed on Tuesday. Spark rate is back to an acceptable value of 2 per day, which means that no intervention is needed.

Linac3 had an excellent week with 100% availability. Tank1 tube will have to be exchanged soon.

LEIR

N. Biancacci reported for LEIR ([Annex 3](#)). A good week with 98% availability. Issues:

- On Monday ER.DWH11 and ER.DEH21 needed piquet intervention to perform reset.
- The same day a few minutes intervention on CRF41.
- On Wednesday ETL.BHN10 current at extraction was changing sign leading to large current excursion. It posed problems to all subsequent cycles (EARLY, NOMINAL or MD). The reason is still not completely clear although it seems that trimming the injection function of ETL.BHN10 in the NOMINAL cycle somehow affected the extraction function. The K values were reloaded and it solved the issue.
- Also on Wednesday, air conditioning in LEIR local control room malfunctioned blowing dusty air. A fix is being investigated.

- On Thursday removed bump in sector 4 as the vacuum issue of the last year seems to be gone.

PSB

J.-F. Comblin presented the status of the PS Booster ([Annex 4](#)). Good week with more than 96% availability. On Sunday kicker repair took 2h30 because the piquet was on intervention in the LHC. SIS had an issue with monitoring of number of turns. The LHC 8b4e beam was made available.

ISOLDE

M. Lozano Bonito reported the status of ISOLDE ([Annex 5](#)). Quite difficult week for ISOLDE. Carbon isotope $^{15}\text{C}^{5+}$ at 4.3 MeV/u was sent to the XT03 line, which had to be recommissioned. There was big discrepancy between the expected intensity and the one reported by the experiment. It was finally found that the experiment measurement was faulty. Couple of small problems with RF and some trips of the target heater.

ISOLDE Users

K. Johnston: This was the first experiment to take beam into the newly-commissioned XT03 beamline where scattering experiments on the halo nucleus ^{15}C are planned. The transmission of the beam to the experimental setup turned out to be very challenging and took a number of days to understand fully. Fortunately, the support from the ISOLDE operations team was fantastic and the beam was successfully delivered to the experiment on Saturday evening. Since then the operation has been quite smooth and the first data look promising.

PS

K. Hanke reported the status of the PS ([Annex 6](#)). Good week with 96% availability, but the downtime was mostly due to the faults of the upstream machines. There was a planned stop for RF cavity repair. A lot of trips on KFA71, but now the situation got improved. Also PR.WDW was often tripping. Currently running PR.WDW with a spare power supply, today the original one should be put back in place.

On the beam side, IRRAD took for the first time a very low intensity EAST beam; this was very successful. For the LHC the 8b4e beam was checked, and for TOF logging of the beam position in TT2 was ensured.

East Area

B. Rae: It was a good week. Intermittent problems with a computer in T9 have been reported to BE-CO. ZT10.QDE5 is tripping rather often without apparent reason. Otherwise smooth running in T8 and T9, with frequent access in both lines. CLOUD will start running in T11 from September 18th: magnet tests can start from now on.

East Area Users



No report.

Comment from **H. Vincke**: RP performed an experiment in the EA and would like to thank for the setting up of the low intensity beam.

nToF

M. Bacak: On the weekend performed beam position tests and found that one of the areas is sensitive to the position. Will run with couple of different settings to define a good setting to the operation team.

AD

P. Freyermuth reported on the AD status ([Annex 7](#)). A good week in AD with 97% availability. Only faults to report were a trip of C02 RF cavity and a quickly solved issue with an injection line power supply.

T. Eriksson reported on **ELENA**: Slow progress in ELENA. With p-bar could see some traces of deceleration. This week development of the profile measurement system with some good results (first b-bar profile looked good). Today and tomorrow survey of survey. Lots of problems with H-stability, suspecting fluctuating field in the main bends. G-bar is expecting H- test beam in a few weeks time, and it is not operational yet.

Question from **B. Mikulec**: The poor H- stability, is it a new problem?

Answer: Not really. It was never stable, but now it looks even worse, however, it is not obvious. Will see how it goes with p-bar.

AD Users

No report.

Comment from **T. Eriksson**: The experiments look for solution of the issue with shortage of helium. At least for the week of Jeune Genevois a solution was found.

SPS

K. Cornelis reported the status of SPS ([Annex 8](#)). 93% availability.

HiRadMat run on Monday and Tuesday with 144 and 288 bunches. Observed an increased spark rate on ZS.

Struggled to increase the intensity for the fixed target MTE beam by 10%.

The 8b4e and 50nsec beams were checked in SPS. Observed increased spark rate on ZS with 8b4e. It is still not fully operational because the transfer to the LHC still needs to be done, which might not be straight-forward as the beam is fatter and the batch length different.

AWAKE is running since Friday. An issue with influence of a TT40 corrector on FT orbit was solved. It turned out to be set to DC while it needs to be pulsed.

Kicker electronics had issues and whole electronics rack had to be exchanged (4h downtime).

North Area



B. Rae: On Friday, H4-QUAD power converter could not reach the value we asked for. First Line investigated for 1.5h and finally decided to run at lower current. Investigations will continue tomorrow.

K12-BEND1 had several trips (supply failures) over the last few days, requiring First Line interventions over the weekend. A detailed investigation was done on Monday, but has to continue during the Wednesday MD.

Otherwise, good beam conditions with good transmission from T4 to T10, but since the end of last week high radiation levels above the H6 beam.

Question from V. Kain: The radiation was because of the wobbling issue?

Answer: The radiation problem on H6 yesterday was due to the change of a beam file by the user. However, even with the beam turned off on H6 the radiation alarm above H6 stays on.

Comment by K. Cornelis: I think it is also due to beam size fluctuations. Also, there are many changes on super-cycle and each time the conditions are slightly different.

North Area Users

No report.

HiRadMat

No report.

AWAKE

No report.

LHC

R. Steerenberg: LHC had a very difficult week because of the 16L2 issue. It is caused by condensated gas in the vacuum chamber. It was checked if higher intensity beam performs better and it was not successful. The intensity was reduced to 1500 bunches, which runs OK now. The 8b4e beam should suppress completely the electron cloud, and it will allow to compare with conditions with and without the electron cloud. There were many beam dumps over the week-end. An important leak has developed on August 18 on the B2 dump requiring large amounts of nitrogen gas to maintain the over-pressure inside the dump. It was evaluated safe for further operation under these conditions.

TI

B. Mikulec: J. Nielsen passed the information that there is nothing special to report for TI.



3. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

UA9 run will take place on September 18, before the TS on the 19th of September. The TS will be followed by a COLDEX run. The exact times still need to be defined.

The facility coordinators for all the machines are requested to present the lists of the technical stop activities during the next meeting.

On August 30 there will be dedicated SPS MD and during this time there will be no beam to NA.

4. AOB

Maintenance of nTOF Target (TFT) access points YEA01.TFT=802 and YEA02.TFT=801 from August 30 at 08h30 until September 1 at 17h30. IMPACT=99474 ([Annex 9](#)).

Maintenance of East Area (EA1) access point YEA01.EA1=157 from September 4 at 08h30 until September 6 at 17h30. IMPACT=99475 ([Annex 10](#)).

RP needs to confirm the intervention and the respective machine representatives approved these interventions.

RP confirmed by email their approval for the interventions.

Comment from V. Kain: LHC machine coordinators agreed to give reports and define beam requests during the FOM meetings starting from the next week.

Next Meeting: 5th of September.

Minutes reported by P.K. Skowronski on 30th of August.



Summary of the 24th FOM Meeting

Held on Tuesday 5th September 2017

Agenda (<https://indico.cern.ch/event/663191/>)

- 1. Follow-up of the last FOM*
- 2. Status of the machine*
- 3. LHC MD3 beam requests*
- 4. Schedule update*
- 5. ITS3 preliminary list of interventions*
- 6. 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 23rd FOM](#) were approved.

2. Status of the machines

Linac2 & Linac3

D. Kuchler reported the status of the linacs.

It was a very good week for Linac2. There was only a 30 min downtime on Monday evening when the RF tripped due to a vacuum interlock. There were some pressure spikes recorded on Tank1 and one of the ion pumps tripped. The RF could be reset and the ion pump was restarted the next day.

The week was much more problematic for Linac3 suffering since Wednesday from an RF issue on tank1. **R. Wegner** reported on this issue ([Annex 1](#)). After instabilities were observed on the tank1 RF, it was decided to replace the tube, on Wednesday afternoon, following the standard procedure. Unfortunately, during the amplifier restart, the crowbar stopped the high voltage at relatively low power level. The amplifier was disassembled on Thursday and the grid1 support was found to be partly molten. On Friday, further investigations showed the replacement tube had a bad vacuum and caused the problem at the restart (first defect of this kind in 20 years). As there was no spare for the grid1 support, and in the view of producing a new one, it was measured at the metrology and its material was analyzed. The first replacement piece in DELRIN will be ready tomorrow and two others, in PEEK, will go into production as soon as possible. The amplifier will be restarted on Friday and normal Linac3 operation will resume on Friday afternoon. Note that it is already foreseen to replace



the RFQ and tank1 amplifiers by solid-state amplifier during the LS2 in the framework of the consolidation project.

R. Alemany asked whether the high-voltage impedance tests that were done on the faulty replacement tube could be now done systematically before any tube replacement. **R. Wegner** answered that this problem never happened in the last 20 years but he will pass the message to the linac RF operation team.

LEIR

S. Jensen reported on the LEIR status ([Annex 2](#)).

As there was no beam for most of the week due to the Linac3 issue, there was nothing special to report.

PSB

V. Forte presented the status of the PS Booster ([Annex 3](#)).

It was a good week with an availability of 98.4%. The main issues were the breakage of the wire-scanner R2H on Monday night (BI team will substitute it during the incoming technical stop along with the prototype wire-scanner), and a beam inhibit that happened on Tuesday for 1h45 (was caused by an access to the switchyard following a PS request for exchanging a tube in cavity 36). There is still an issue with R4 MRP (BI following-up). Many MDs were scheduled and performed last week, emittance measurements along the cycle, finalisation of BCMS 1.5 eVs, RF tests and MTE optimisations.

ISOLDE

E. Malti reported the status of ISOLDE ([Annex 4](#)).

It was a quiet week and the experiment on XT03 ran pretty smoothly. There were many RF issues related to cooling water interlocks which are being solved now. A new target was installed on HRS.

ISOLDE Users

K. Johnston reported that last week's run on GPS was a continuation of the previous with IS619 taking ^{15}C to the third beamline of HIE-ISOLDE (scattering chamber) where scattering measurements of ^{15}C from a ^{208}Pb target were made to study the properties of this halo nucleus. With the exception of a few trips from time to time and occasional optimization, the run went quite smoothly, and new data were obtained on this system. Since yesterday morning GPS is running for medical isotopes and biophysics and HRS is setting up for laser spectroscopy of Ni, which should start properly on Friday morning.

PS

H. Damerou reported the status of the PS ([Annex 5](#)).



It was another very good week for the PS with an average beam availability of 98%. No beam could be delivered to TOF on Monday evening during 25 minutes due to an issue with the power converter of a quadrupole (QF0415S) in the FTN line. On Tuesday a short access was required to exchange the final amplifier of the 10 MHz cavity C10-36 causing a total downtime of 2h. The 8b4e 56 bunch beam has been optimized and delivered to the SPS since Friday. On request of the experiment in the T9 branch of the east hall, which will finish on 13/09, as many EAST_North cycles as possible are produced in agreement with the physics coordinator. The preparation of 8b4e and BC(MS) (4x8 bunches) is being prepared. Although ToF was penalized last week, the integrated delivered beam intensity is still well above schedule.

East Area

B. Rae said that it was a smooth operation for all beam lines in use. T11 will start operation for CLOUD on September 18th. Magnets have been tested successfully.

East Area Users

H. Wilkens said the users were very happy as they received 80% more intensity than standard weeks.

nToF Users

There was no report.

AD - ELENA

L. Botjar reported the status of the AD.

The AD ran pretty well. There were nevertheless few problems over the week. The injection kicker went down many times causing radiation alarms and on Friday evening a thyatron finally broke down. The specialist came in and solved the issue. The injected intensity varied sometimes about 20%. It seems to come from a regulation problem of a power supply in the injection line and it will be further investigated this week.

T. Eriksson reported on the ELENA status.

There are waiting for the RF reliability to improve. There are still some H⁻ source instabilities. The Ecooler has to be installed but there is no detailed planning for installation yet.

AD Users

H. Wilkens said it was a week with good beam availability. The AD experiments could have an issue with liquid helium during the long weekend. The delivery is normally planned before Thursday. The BASE experiment will continue running until Friday when other experiments will hopefully be able to cool down.



SPS

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

It was a very good week in the SPS with an availability of more than 95% with the main faults coming from the injector chain and a scheduled intervention of 2h last Thursday, where a limitation against overdriving the new solid state amplifiers was implemented in the RF low level. During the MD on Tuesday to measure the tune shift in the SPS with intensity, experts found that the chirp signal was not properly configured (had not been for years) and repaired it. The FESA class to automatically measure the tune bunch-by-bunch from the injection was finalized by the damper team. Since Wednesday evening the quality of the fixed target beam with about $3.4e+13$ is very good from the PS and a transmission of more than 96% could be achieved in the SPS. On Friday, intensity fluctuations at 70 Hz appeared on the slow extracted spill linked to a ripple at the same frequency of the SPS main dipoles. The EPC experts investigated and removed finally SMD11 from the configuration.

North Area

B. Rae said that the beam quality (H6 dose, transmission to T10) improved significantly. On Thursday morning, a general water cooling problem in BA81, tripping many power converters. It was due to a valve opened by users (about 1 hour lost). COMPASS/M2 had some problems with the SM2 spectrometer in the last few weeks. When they change polarity (2x per week), they see often a "MCB Error" and the power converter cannot be reset. The CCC always needs to call a piquet when this happens and the problem can be solved remotely.

North Area Users

H. Wilkens said it was a good week for the NA users.

HiRadMat

There was no report.

AWAKE

E. Gschwendtner could not be present at the meeting and sent the following information:

AWAKE physics run since 25 August 2017 until Monday, 11 September early morning. During this run the alignment of the laser and the proton beam has been strongly improved, which is reflected in more stable measurements of the seeded proton self-modulation. Laser timing scans and beam intensity scans are performed at different plasma densities, unfortunately some of the measurements had to be delayed due to the frequent LHC filling. Several short accesses were needed to fix experimental diagnostics and laser issues.



LHC

R. Steerenberg said that the week started pretty well with standard beam using 1500 per beam. Few ramps were then lost in 16L2 during the week that forced operation to go down to 1164 bunches. The tests with 8b4e worked very well. And the LHC is now taking 1500 bunches. A comparison with and without electron cloud will be drawn. A decision will be taken in the LMC on the strategy to adopt in the coming days.

TI

J. Nielsen reported on the main perturbations of the week. There was a major water leak on Tuesday in BA2. Wednesday. On Thursday, there was a trip of the NA cooling station in BA81 due to a user refilling his circuit.

3. LHC MD3 beam requests

M. Solfaroli presented the LHC MD3 beam requests ([Annex 7](#)). Several beams (high intensity 8b+4e and $1.4e+11$ 25ns standard) still need preparation. The Wednesday MD still needs to be confirmed depending on the machine status at that time.

K. Cornelis commented that information on how often they will request the beam should be provided.

4. Schedule update

V. Kain presented the injector schedule version 1.4 ([Annex 8](#)).

The LHC MD3 is taking place next week. The technical stop is scheduled for the following week. In view of the technical stop, RP will circulate a tentative planning for beam stops and access start times by the end of the week. It will be presented at the next FOM.

5. ITS3 preliminary list of activities

A. Berjillos presented the list of Linac2 and Linac3 activities ([Annex 9](#)). The Linac3 source plasma chamber will be replaced from the 18/09. Normal operation is scheduled to resume on the 22/09

D. Nicosia presented the list of LEIR activities ([Annex 10](#)). The LEIR TS is depending on the Linac3 schedule and will be extended accordingly. The maintenance of the BPMs in the ITE line taking place in the switch yard, it will be coordinated together with the PS coordination.

D. Hay presented the list of PSB activities ([Annex 11](#)). The 2L1 and 4L1 wire-scanners will be replaced. The cabling intervention is meant as a test in preparation of the 131 cable installation scheduled in the YETS. It requires a special authorization for the safety group. The intervention on the pickup coil will



require a main power supply lock-out. Concerning the wire-scanner replacements, **J. Ferreira** commented that the vacuum group will first intervene in the PS as the pump down time is much longer there.

F. Pedrosa presented the list of PS activities ([Annex 12](#)). He highlighted the interventions requiring a stop longer than 24 hours. They will be discussed with intervention responsables.

D. Macfarlane presented the list of SPS activities ([Annex 13](#)). At the moment. There is no intervention requiring breaking the vacuum. Intervention are mainly usual visits and maintenance. The BA5 lift is out of order and should be repaired. If a 2 hours access occurs by the technical stop time, EN/EL should be informed such that they can anticipate the TS work. In the worst case scenario, access to BA5 will be granted through BA6. As usual, one can expect to have a more complete list of activities next week.

6. AOB

There was no AOB.

Next Meeting: Tuesday 12th September 2017

Minutes reported by [JB. Lallement](#) on 6th September.



Summary of the 25th FOM Meeting

Held on Tuesday 12th September 2017

Agenda (<https://indico.cern.ch/event/664556>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Schedule updates*
- 4. Update on Injector Technical Stop 3 list of interventions*
- 5. AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in [Annex 1](#).

1. Follow-up of the last FOM

Minutes of the last meeting were approved.
Beam stop times for the forthcoming technical stop will be defined at point 4 of the meeting.

2. Status of the machines

Linac2&Linac3

R. Scrivens (replacing **F. Di Lorenzo**) reported the status of the Linacs ([Annex 2](#)).
Linac2 availability was 100%. There was a single 3 minutes interruption of the source, the cause was not identified.

Linac3 had 0% availability due to the continued Tank1 RF amplifier repair, which is down since 30th of August. The old tube is being fitted back and it should be ready by today night.
Otherwise, the RF source generator tripped twice, on Thursday morning and Sunday evening.
There will be no beam next week due to the planned source maintenance.

LEIR

N. Biancacci reported for LEIR ([Annex 3](#)). LEIR was off all the week because of the Linac3 unavailability.



PSB

G.P. Di Giovanni presented the status of the PS Booster ([Annex 4](#)).

Availability was 98%. There was only one important downtime due to PS access on Friday morning to investigate a potential water leak. Otherwise only minor failures could be all quickly reset. There is a BI issue with not yet available MRP and orbit in ring4. A broken electronics card arrived at CERN, but was not yet delivered to the experts. It is a potential issue if orbit diagnostics is needed in case of problems.

Question from R. Steerenberg: There was no spare at CERN?

Answer: No compatible spare could be found. Another batch of spares was ordered already some months ago, but for some reason there was this large delay in the delivery.

ISOLDE

E. Fadakis reported the status of ISOLDE ([Annex 5](#))

Busy week because several experiments were running in parallel and at the same time new beam for the following HIE run was being commissioned:

- In GPS collections on GHM (172Lu, 155Tb, 149Gd16O), GLM (152Tb, 155Tb) and ISOLTRAP takes stable beam from GPS(50Ti).
- On HRS COLLAPS takes stable (58Ni, 60Ni, 61Ni, 62Ni) and radioactive (56Ni, 66Ni, 67Ni, 68Ni, 70Ni) beams.
- On REX-HIE preparation for next HIE run with 94Rb23+ ($A/q=4.0$, $E=6.3\text{MeV/u}$)
 - Intervention on REX amplifiers for longer RF pulses (1.6 ms).
 - Re-phasing of all 15 SRF cavities was needed.

Issues:

- On 1 occasion all GHM, GLM and most of GPS electrostatic elements went off simultaneously, even though the valves for GHM and GLM were closed. To be investigated.
- Circuit breaker EXD12.10 tripped and with it all electrostatic elements. Further investigation needed by EL technician.
- HV for HRS tripped once. Target heating tripped but restarted by users.
- Issue with water flow for IHS required RF experts to enter the HIE tunnel to resolve it (4 hours intervention).
- When the CCV of BTY.DHZ323 is 0.0A the AQN goes to either 40A or 23A and the beam is lost. If 0.01A is chosen then the AQN is ok. Issue created yesterday [APS-7094].

Comment from B. Mikulec: It is a well-known issue for this type of power supplies that they cannot regulate with a 0.00 A CCV.

ISOLDE Users



K. Johnston (delivered by email): It was a busy week on GPS with beam development and physics alternating throughout the week. The production of Ti, Sc and Se beams was examined using the ISOLDE lasers, the ISOLDE target group and ISOLTRAP. Se and Ti do not look possible using this target and ion source combination but radiogenic Sc was confirmed for the first time.

In addition, collections of rare earth isotopes for medical physics and biophysics took place. ^{155}Tb , ^{152}Tb were successfully collected and shipped to PSI (CH), NPL (UK) and Helsinki. The ISOLDE side of this work went very well, it's too soon to say about the experiments in the various institutes as these have just started.

On HRS over the weekend it was a difficult Ni beam time for the COLLAPS laser experiment, the yields of the isotopes were not as expected and it is unlikely that the collaboration will get the data that they were looking for on ^{70}Ni and ^{56}Ni .

PS

A. Guerrero Ollacarizqueta reported the status of the PS ([Annex 6](#)).

Availability was 98.4%. Only one important stop due to cooling water issue. It was thought that there was a leak, but it turned out that it was only a not working pump.

Activities:

- Switched POPS to B-train transmission via W-R.
- Operational beams OK, in particular, delivered $8b4e$ $12-13e10\text{ppb}$ to the LHC.
- Work on LHC MD beams:
 - LHC $8b4e$ HI ($18e10\text{ppb}$)
 - LHC50ns for $6b6e$ request
- Prepared a $8b4e$ BC beam: $32b$ ($12-19e10\text{ppb}$) with $E_h/v \sim 1.7\mu\text{m}$

Special beam requests for LHC MD came too late. The cycle priorities need to be defined on the management level and more guidance is needed from the LHC side.

Question from **H. Damerou**: Does the LHC MD beams have higher priority than the physics beams?

Comment from **K. Hanke**: Depending on which forum is inquired the priorities are different (IEFC or LMC), and a decision from the hierarchy at the department level is needed.

Comment from **B. Mikulec**: **R. Steerenberg** seems to be the proper person to bring up this question.

East Area

B. Rae: A very good week.

East Area Users

H. Wilkens: The experiments are very happy thanks to the relatively large amount of spills delivered.

nToF



No report.

AD

B. Lefort reported on the AD status ([Annex 7](#)). 95% availability. The long-standing issue of beam position instability was finally traced back to the DE0.DHZ45 power supply that was not following the requested value. Power cycling fixed the issue. Cavity C10-26 tripped several times due to the grid power supply, which is at the current limit, and the specialist has increased the current limit. Also the injection kicker tripped several times and the specialist changed a faulty thyatron and masked a sensor in the hydraulic group.

Question from **B. Mikulec**: Concerning the power supply, the tolerances were not defined in the control system to trigger an adequate alarm if the acquisition is too far from the setting?

Answer: I am not sure, we will check if the numbers were defined correctly.

AD Users

H. Wilkens: All liquid Helium was delivered last week, despite the Jeune Genevois interruption. Thanks to the cryolab organising 2 empty dewar collections a day, and the experiments being diligent in returning the dewars. The ASACUSA collaboration is reconfiguring the apparatus from the p-bar/He experiment to the CUSP experiment. Their allocated beam time was used by the ALPHA and AEGIS collaboration. ASACUSA will restart Monday 18th.

ELENA

B. Lefort: ELENA has been taking p-bars last week and this Monday. This beam time has been used mainly to check the machine optics. The H⁻ source stability study is still ongoing.

SPS

K. Cornelis reported for the SPS ([Annex 8](#)). It was a very good week with 97% availability. Beam for HiRadMat on Monday and Tuesday morning with INDIV and 288 bunches. On Wednesday evening there were difficulties with the transmission of the FT beam (grids in TT2), now it is up to 96%. 8b4e is in use for LHC filling. On Friday its intensity was increased to 1.23e11, but on Saturday it was requested to bring it back to 1.1e11. AWAKE was running all afternoons and evenings with problems, mostly due to 800MHz. It was caused by a faulty isolating transformer, which was exchanged on Monday. QD circuit had 600Hz ripple.

North Area

B. Rae: COMPASS suffers with its magnet, which will be fixed during the forthcoming Technical Stop. There were some other minor faults that could be quickly reset.



North Area Users

H. Wilkens: Experiments are very happy as they profited from the great availability of the machines.

HiRadMat

No report.

AWAKE

E. Gschwendtner: AWAKE yesterday finished the run and started an installation period. Will ask for beam at the end of October or in November.

LHC

R. Steerenberg reported for the LHC. Successfully running with the 8b4e beam, at the moment with 1900 bunches. The BCMS version of 8b4e is in preparation in the injectors. It would have a more favourable filling scheme and would deliver smaller emittance.

Comment from **B. Mikulec:** Concerning the beams to be prepared for the forthcoming LHC MD, it seems there were some modifications to the list presented last week.

Answer by **G.P. Di Giovanni:** On Saturday came a new request for a Van der Meer type beam with 4 bunches, and this morning this request was again changed for a 6b6e beam.

Comment from **B. Mikulec:** If there is any change in the requested list of beams it should be circulated to all machine supervisors.

R. Steerenberg: The reason for the change was that high intensity MD requests could not be fulfilled due to the LHC 16L2 problem.

Question from **R. Alemany Fernandez:** Which MD user requested that?

Answer: MD2167.

Comment from **K. Cornelis:** Not all the combinations are possible in the SPS.

Comment from **V. Kain:** That is why it is even more important to know the requests early because if it is impossible to fill in SPS it is a waste of time to work on it in PSB and PS.

Comment from **G. Papotti:** Also the filling scheme cannot be changed quickly because it requires modification of a software application that can be done only by one person, and if he is busy on his shifts he cannot work on this at the same time.

Comment from **K. Cornelis:** Discussing with us may help to find a much easier solution. The requests always demand an ideal beam, but very often there is already another beam that in principle fulfils the requirement.

There is an ATLAS intervention during the technical stop that is scheduled to finish in time for beam on Thursday around 08:00. However, it is not excluded that their intervention might take a bit longer, which would mean that the LHC restart with beam might also be later Thursday morning. Irrespective of that the injectors should get ready to deliver beam to the LHC as of Thursday morning 08:00.



Question from G.P. Di Giovanni: Is the 8b4e the new 2017 standard LHC beam?

Answer: Yes, at least until the end of the year, until the 16L2 issue is solved.

CLEAR

P. Skowronski (in place of **D. Gamba**, [Annex 9](#)). CLEAR had its first beam on August 18th. Last Friday the first beam was transported to the end of the CALIFES injector. Still fighting with many operational issues due to the upgrade of RF network and control system, big thanks for the continuous CO support. This week there are installations for the first experiment, which should be completed by Friday when the beam operation shall restart.

TI

J. Nilsen: Concerning the suspicion of water leak PS, past weeks alarms on the water system were recorded, but they could not be detailed because of a an ongoing at that time a control system update. It was verified locally that there was higher consumption of the cooling water. That is why we communicated to PS that there is a potential water leak.

There was electrical perturbation on Sun morning 6AM confirmed by EDF.

3. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

LHC MD this week, UA9 and Coldex run next week surrounding the Injector Technical Stop 3.

The beam stop times before the Injector Technical Stop 3:

- Monday 18/09 16:00: Stop all high-intensity and high-loss beams (EAST area beams, ISOLDE, nToF, SFTPRO)
- Tuesday 19/09 5:00: Stop all remaining proton beams except the COAST beam for UA9
- Tuesday 19/09 7:30: Stop COAST beam and ion beams

RP will enter for the RP survey in the injectors at 8:00, general access for ITS3 activities from 8:30. The machines will close as soon as all interventions will be finished, but in any case before 21:00 on Tuesday 19/09.

Linac2 will restart with beam in the late afternoon/evening of Tuesday 19/09 after the end of the controls upgrades.

PS and PSB will restart with beam once vacuum conditions permit, presumably early Wednesday morning (20/09).

All p injectors have to try to restart as soon as possible to allow for a successful COLDEX run Wednesday morning.



4. Update on Injector Technical Stop 3 list of interventions

Linacs

Presented by **A. Berjillos** replacing **C. Mastrostefano** ([Annex 10](#)).

For Linac2 4 new IMPACTs were created

- Installation of N2 bottle in intersection tank 1
- Maintenance of ventilation and change of filters
- Control of the regulation FTEF-00216
- Urgent intervention on the control access, which is created only in case of troubles with the access system.

For Linac3 there is 1 new IMPACT for magnet inspection.

LEIR

Presented by **D. Nicosia** ([Annex 11](#)).

2 additional IMPACTs created

- Change of SEMgrid electronics of ETL.MSF30
- Maintenance of 2 PUs in the ITE line

Both will finish by 5PM.

PSB

Presented by **D. Hay** ([Annex 12](#)).

1 new request to install two LHC type BLMs at BR.BHZ52.

Comment from **B. Mikulec**: The BLMs are installed to better understand the losses in this area, which made it quite radioactive, so it needs to be checked by RP.

Safety team approved works for cabling installation.

Concerning the replacement of a pickup coil in the reference magnet, it was agreed that it will be locked out and not disconnected what is easier from an operation point of view.

PS

Presented by **F. Pedrosa** ([Annex 13](#)).

Several new IMPACTs created

- Calibration and installation of 3rd chain WR B-train; around the the reference magnet, but transparent for the re-start
- LEIR ITE line BPMs
- Reparation smoke detector in TT2; transparent for access and re-start



The replacement of PS SS64 WS has the biggest time constraint due to the long vacuum recovery time and similar activities in other machines. It is the only activity that might finish after 5PM.

Comment from **P. Demarest**: We should be out of the machine by 5PM, but the vacuum will not recover before 21h.

SPS

Presented by **F. Pedrosa** replacing **D. Mcfarlane** ([Annex 14](#)).

More than 20 new IMPACTs.

In BA1 all accesses are in the afternoon because in the morning the lift will be under repair. If it is not finished then accesses will be via BA6.

Also BA2 accesses are only in the afternoon.

Concerning BA5

- Access has been granted by RP for IMPACT 99570 to access at 08:00 (via stairs at BA5)
- Lift repair will start at 07:00 (hopefully will only last 1 hour)
- If the lift repairs are not complete then access will be via BA6 or BA4
- It is not allowed to open the doors between ECX5 and ECA5!!! Otherwise patrol to follow takes a lot of time.
- New IMPACT: Exchange of failing PU jack on QD52310 or neighbouring magnets. The exact position needs to be determined

Question from **B. Mikulec**: There was a question if pulling of cables can be approved, was it clarified?

H. Vincke: The IMPACT never came, so it is not possible to discuss without details. What I understood it dealt with a highly radioactive area, therefore I would recommend to postpone it to the shutdown.

Question from **M. Gourber-Pace**: Until when the control system needs to be functional on the day of the technical stop?

Answer by **B. Mikulec**: Until 8AM.

Question from **B. Mikulec**: For Linac2, when the control need to be back?

Answer by **M. Gourber-Pace**: Controls will not restart earlier than 18h. Most of the systems should be back earlier, but it will not be in a state valid for operation.

Comment from **R. Scrivens**: RF system of Linac2 needs the control system 2h prior to when the beam can be restarted.

5. AOB

D. Chapuis requested maintenance of the access point YEA04.PSR=353 ([Annex 14](#)) from Thursday 14th September 8h30 to Friday 15th September 17h00 (IMPACT No. 100007).

The intervention was approved.



Next Meeting: 19th of September.

Minutes reported by P.K. Skowronski on 13th of September.



Summary of the 26th FOM Meeting

Held on Tuesday 19th September 2017

Agenda <https://indico.cern.ch/event/666609/>

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule update*
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 25th FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

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

Linac2 had a very good week with 99.9% availability. The only fault was related to an issue with the first LEBT solenoid power converter.

The Linac3 tank1 amplifier repair was finished on Monday evening, and the beam was back to LEIR on Tuesday afternoon. The linac will be off most of the week for allowing for the ion source maintenance.

B. Mikulec asked if an RF tube replacement was planned in the Linac3. **R. Scrivens** replied that if any replacement, the tubes would be tested before. After the meeting, he informed that the RFQ driver tube was being replaced.

LEIR

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

The beam was back to LEIR on Tuesday afternoon. There were many MDs during the week, ITE scrubbing run took place during the week-end and Xe EARLY beam was sent to the SPS for setting-up. There were also few faults related to EI.QFN20, samplers and temperature of several main quads. Because of the Linac3 source maintenance, LEIR will be off for all the week.



PSB

S. Albright presented the status of the PS Booster ([Annex 3](#)).

It was a very good week for the PSB with an availability of 99.6% and no major faults or downtime. From the PSB standpoint the MDs for the LHC were very successful, all non-standard beams were produced on time and within specification. Work is on-going to increase the intensity of MTE on SPS request. The 8b4e was migrated to an operational user and its high brightness version is available if requested.

ISOLDE

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

It was a pretty good week from the operations point of view. The accelerators have been very stable and there has been barely any downtime due to problems with the equipment in the facility. The set-up for a new HIE-ISOLDE experiment (94Rb with an energy of 6.2 MeV/u from the GPS target to the Miniball experimental station) took place. It was the first experiment that required using all 15 superconducting cavities. Radioactive beam was delivered from Wednesday evening (stable beam a day before). The target, separator and the linac have behaved very well. However, the beam intensities originally planned were not delivered due to the radiation level in a couple of hot spots in the hall and the proton current during these days had to be lowered. The users have started seeing hints of new physics.

ISOLDE Users

K. Johnston said that there was one experiment running last week on GPS taking 94Rb to the Miniball station at 6.2 MeV/u. This was a novel experiment using a strong primary ISOLDE beam to transfer neutrons to a stable Pb target in a bid to explore the excited states of exotic Pb isotopes. In spite of its novelty the proof of principle for the experiment was demonstrated after a number of hours with clear nucleon transfer visible in the spectra. Unfortunately the intensity of the beam was limited by radiation alarms which meant that the experiment couldn't run at its full capability. In the end good data were taken, but the full regime which was to be studied wasn't possible due to the limitations of the protons. In future more concrete procedures to allow ISOLDE to handle such instances will be put in place and this is currently being followed up.

F. Pirotte commented that with such radiation levels, the hall becomes classified as limited stay area and that RP asks fencing off such areas. She added that ISOLDE is presently setting up a procedure, which was unfortunately not fully ready last week, as the measured radiation level was kind of unexpected.

E. Bravin asked whether this hasn't been taken into account for the design of HIE-ISOLDE. **A Rodriguez** answered that the losses were not there, but in the low-energy beam lines.

PS

K. Hanke reported the status of the PS ([Annex 5](#)).



It was a difficult week for the PS. There were repeated trips of the PFW power supplies (issue still ongoing). On Wednesday-Thursday a long stop (mainly affecting the AD) was due to an incompatibility at the hardware level between the normal PC and the spare one (it will be looked at during the YETS). There were many trips of different power converters during the week. The wire-scanners 65H and 85V got stuck on several occasions. An access was needed to move the 85V in parking position. On the positive side all beams requested by the LHC MD were delivered without problems. The MTE intensity was being ramped up. The fault classifications (mainly the ones affecting only the AD user) will be discussed with the AFT team.

C. Mugnier confirmed that EPC was investigating the issue related to the PFW power supplies.

East Area

B. Rae said that there was nothing special to report.

East Area Users

H. Wilkens said that everything went fine and that last week they returned to a standard distribution of spills. The CLOUD experiment is starting this week.

nToF Users

F. Mingrone said that they were commissioning the second experimental area and one could expect many accesses in the next days. They asked for intensity limitations, as the two experiments are rather sensitive.

AD - ELENA

L. Bojtar reported the status of the AD.

Apart from the beam production issues in the PS, it was a very good week with only 0.5h downtime.

AD Users

H. Wilkens said that the ALPHA experiment had to warm up.

SPS

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

It was a relatively good week for the SPS with an overall beam availability of about 90% for the North Area experiments. Since Thursday the intensity on the Fixed Target cycle was further increased following the user requested sharing on the targets. Presently the beam intensity at flat top is about $3.5e13$ p with an excellent transmission of about 95% in the SPS. The major part of the downtime was caused by the injectors (about 12 hours). Apart from that, the beam had to be stopped for about an hour on Monday for an intervention on the 800 MHz RF. Furthermore it was realized that the active



filter on the QD circuit was not working, which resulted in significant ripple at 600 Hz. This was fixed by an intervention on the PLCs controlling the active filters on Tuesday, which lasted also one hour. Since then the ripples at 600 Hz and at 70 Hz on the QD circuit are gone. Besides the 8b4e beam presently used for LHC physics production, the SPS delivered a variety of different beams for the LHC MD block #3 which took place from Wednesday morning until the end of the week. This went rather smoothly, the only exception being the high intensity 8b4e beam with $1.6e11$ p/b as requested for the high pile-up studies: The ZS voltage had to be reduced in order to avoid sparking in the extraction septa and consequently the North Area physics had to be paused both during the preparation of this beam on Tuesday and during the actual delivery to the LHC on Wednesday. Worth mentioning is that the BCMS variant of the 8b4e beam was prepared for potential use in the LHC after the technical stop. The SPS measured transverse emittances of about $1.3 \mu\text{m}$ for 2×32 bunches with $1.2e11$ p/b at flat top. Finally, first tests with partially stripped Xe ($39+$) took place on Thursday and Friday on a parallel MD cycle in preparation of detailed lifetime studies. So far it seems the lifetime due to stripping on the residual gas is of the order of 1 s.

E. Bravin commented that as the new BCMS beam was ready, the LHC would take it soon.

North Area

B. Rae said it was a good week as well.

North Area Users

H. Wilkens said that NA64 asked to increase the protons on target last week. They returned yesterday to nominal intensity.

HiRadMat

There was no report.

AWAKE

There was no report.

LHC

E. Bravin said that the machine was presently in technical stop. They will take the beam Thursday. They will then proceed to the usual intensity ramp up aiming at 1900 bunches. They will most likely start with normal BCMS and try the new BCMS during the week-end. The present integrated luminosity is 23 fb^{-1} (40-45 being scheduled for the 2017 run). Due to the intensity limitation, they will probably re-schedule and postpone some test runs for next year and will certainly take the PILOT Xe beam on week 41 or 45.



CLEAR

F. Tecker reported the status of the CLEAR ([Annex 7](#)).

The plasma lens experiment was installed. They are still debugging some control issues and the beam was scheduled for today.

TI

J. Nielsen said that the SPS and the LHC operations were perturbed by a glitch on the SIG network on Saturday morning.

3. Schedule update.

B. Mikulec presented the injector schedule version 1.4 ([Annex 8](#)).

The injector TS was on-going. The UA9 run took place yesterday. The COLDEX run will start at 8.00 tomorrow morning for 24 hours (including the access for the removal of the experiment).

R. Froeschl said that during the survey, they found the Linac2 dose rate to be higher than usual. R. Scrivens will investigate and discuss with PSB operation whether the beam was properly stopped in the morning.

Remark: It was confirmed after the meeting that OP stopped the beams according to the instructions; the issue was that due to the presence of the COAST beam for UA9 the beam for all remaining ZERO cycles was sent to the Linac2 dump. For the future it was decided to put the low-energy beam stopper IN each time after the SPS has been filled (in case of a preceding UA9 run).

A. Bland reminded that CO maintenance was taking place during the TS with server updates and reboots. All the controls consoles will be rebooted before 5.00 PM.

4. AOB

There was no AOB.

Next Meeting: Tuesday 26th September 2017.

Minutes reported by [JB. Lallement](#) on 21st September.



Summary of the 27th FOM Meeting

Held on Tuesday 26th September 2017

Agenda (<https://indico.cern.ch/event/668260>)

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Debriefing of the ITS3*
- 4. Schedule updates*
- 5. AOB*

B. Mikulec chaired the meeting.
The list of presence can be found in [Annex 1](#).

1. Follow-up of the last FOM

Minutes of the last meeting were approved.

2. Status of the machines

LHC

M. Giovannozzi reported for the LHC. Smooth restart after the technical stop. Next fill will be with normal (non-BCMS) 8b4e beam with higher intensity of $1.2 \cdot 10^{11}$ protons per bunch to check if the newly installed solenoid gives any improvement. BCMS version of 8b4e will be asked later.

Comment from **R. Froeschl**: The yearly 30 hour RP survey for beam loss studies could be scheduled after the stop of the high intensity beams. The first high intensity beam to be stopped will be SFTPRO on Oct 23. The survey could be envisaged for Oct 24, but this collides with the LHC MD4 block. The date for the 30 hour survey has to be further discussed.

Comment from **R. Steerenberg**: Indeed, this would compromise the MD.

Comment from **R. Froeschl**: Another possibility is to stop on December 4 to measure on December 5, but the information from the SFTPRO losses would be lost.

Comment from **R. Steerenberg**: There was also a proposition to move the MD4 block to week 47.

Comment from **B. Mikulec**: This needs to be further discussed.

Comment from **K. Cornelis**: This measurement after the stop of SFTPRO is very important for the SPS because of the changes that were implemented the past year to see if this led to a real improvement in the machine activation. We should not lose the possibility for direct comparison.

Linac2&Linac3

D. Kuchler provided the report by email, presentation is at [Annex 2](#).

G. Bellodi was the Linac2 supervisor and the machine availability was 99%.

For the technical stop on Tuesday all foreseen interventions were completed: air filters maintenance, source HV column cleaning, removal of dust sensor, installation of N2 feeding cable at tank1 intersection, control of tunnel cooling.

Thursday night: At 23h vacuum pressure spikes in Tank1 triggered an RF interlock on all tanks, not immediately resettable. RF expert was called on site. A reset of the tanks and restart of operation was possible after 30 minutes. The problem re-appeared just before 5am, but this time RF reset worked immediately. On Friday morning the vacuum team carried out investigations on an ion pump near Tank1, which was found to have gone off during the night a couple of hours before the Interlock. Upon inspection in the tunnel the ion pump was found to be faulty and was switched off. The quality of vacuum in the DTL should not be compromised by this. The RF interlock connected to the faulty pump has been moved to a different pump right next to it.

At Linac3 the source maintenance was done (plasma chamber, extraction system and gas bottle changed). The beam was back on Friday afternoon. The source is still a bit unstable and conditioning is ongoing.

LEIR

M.E. Angelotta presented the LEIR status ([Annex 3](#)). LEIR was off from Monday 18/09 to Friday 22/09 due to the Linac3 source maintenance works. It restarted with low-intensity EARLY/NOMINAL beams. There was an issue with ITE.BHN30 that often tripped over the weekend. It was restarted by the SIS automatic recovery system. Experts have reverted one parameter back to previous value on Monday 25/09 afternoon.

On 22nd and 23rd of September there was LLRF MD in preparation for LIU:

- Deployed h=3+6. Synchronization algorithm will be upgraded soon.
- Operation with h=2+4+6 (with two cavities) partially deployed.

CRF43 tripped with non-recoverable INTERLOCK fault. The problem was solved on 25th of September.

PSB

A. Findlay presented the status of the PS Booster ([Annex 4](#)). It was a decent week with 97.5% availability, where most of the stops were due to the linacs. On Tuesday the technical stop took place, for which all the works were carried out as planned. Vacuum recovery after wire scanner installations dictated that the beam was back in the PSB on Wednesday at 2AM. R4 didn't come back due to an LLRF issue, which was fixed by the specialists. Later it was found to be a general bug in the updated firmware for all rings. The RF specialists returned to a previous version of the



firmware, which required a 15 minute beam stop on Wednesday afternoon and it's been stable since. The replaced horizontal wire scanner in R2 is working correctly once more.

ISOLDE

E. Siesling reported the status of ISOLDE ([Annex 5](#)). It has been another very good week at ISOLDE with 98% availability.

At HRS the target change was carried out on Monday and setting up of the beam started for the VITO experiment. On Thursday some difficulties with setting up bunched beam through the HRS ISCOOL (RFQ). It was previously running at 40kV and changing to 50kV was not straightforward. On Thursday afternoon managed to deliver stable beam to VITO. Later that night continued with the radioactive run (Na beams). They have been running very smoothly since.

At GPS/HIE ISOLDE there was one more day (from Wednesday until Thursday morning) of 94Rb with a 6.2MeV/u at a reduced proton current (0.5uA) delivered to the Miniball experiment. Afterwards, at the Low Energy part of ISOLDE, there were some collections of long lived 226Ra at the GLM line (without protons on target).

On Friday the target at GPS was changed according to the schedule. Stable beam setting-up has started for the next HIE ISOLDE run and will continue on Monday.

Technical problems:

- The Technical stop on Tuesday has been pretty much transparent for ISOLDE.
- Only two trips of REX RF amplifiers (7 Gap1 & 3) and once an SRF amplifier (XLH2.CAV3) on Wednesday during the HIE ISOLDE run for Miniball. The machine has been remarkably stable during the whole run considering all 15 SRF amplifiers are running at high gradient. Also on the REX side things have been very stable.
- A turbo pump controller had to be replaced at REX Trap on Wednesday morning.
- For some time now some of the convertors for the electrostatic elements in the MSW/CAO sector would drop off. Specialist replaced some of the old connections on the inhibit/vacuum interlocks and the situation seem to be stable now.
- The power convertors for one of the elements in the HRS sector (HRS.QP330-Vert & Hor) trips from time to time. The power supplies have been changed, but the issue is still there. This might be related to a cable problem or short in the machine. To be investigated.
- Few interruptions of protons from PSB, but causing very little downtime.

ISOLDE Users

K. Johnston: The main users last week were on HRS taking polarised 26-28Na beams to the VITO beamline. The aim here is to perform beta-NMR measurements on liquid samples using a differential pumping system. This is a challenging experiment and it is still in its early days. The



operation of ISOLDE was very smooth over the course of the experiment and the first measurements in ionic liquids have been carried out. The next step will be to study DNA quadruplexes, which may be possible before the end of the year. In addition, on GPS two shifts were taken by Miniball of ^{94}Rb at 6.4MeV/u after the technical stop before HRS took the remainder of the week.

PS

D. Cotte reported the status of the PS ([Annex 6](#)). Beam availability 89%. Little bit difficult restart after the technical stop:

- Vacuum condition ready for beam around 3AM on Wednesday morning.
- V346 process not running on cfv-353-allbc4, restarted by RF specialist.
- Pulse repeater power supply cable unplugged in Central building, what prevented C20/C40/C80 cavities to pulse (downtime 4h).
- Beam for COLDEX available around noon on Wednesday instead of 8AM.
- C80/08 relay gap was staying open and in local mode, which was solved by the RF specialist.

PFW are not tripping anymore and regulation seems to be better. 2 vertical FWS back in operation. Other issues:

- Another pulse repeater for LLRF got broken on Friday night (downtime 3h30). Huge radiation levels reported by RP during its troubleshooting and it is still being investigated. SR16 reminder was sent to PS&PSB section.
- POPS tripped twice this week, but the restart was immediate.

PS delivered integrated 1.44×10^{19} protons for nTOF, which is 77.8 % of the total intensity forecasted for 2017. Automatic logging of FTN.BTV484 screenshots is now available in Timber.

East Area

L. Gatignon: CLOUD experiment started and it runs smoothly, as well as “Beam for schools”. This Friday, 29th of September, in the East Area there will be a visit of the Council and Canadian ambassador at 12h45. The beams need to be stopped 15 minutes before. CCC will be called when the visit is finished.

East Area Users

H. Wilkens: The 2017 edition of Beam Lines for School had 180 participating teams, a total 1500 high-school students from 41 countries participated to preparing proposals. Two teams were selected as winners and are now using the T9 beam line: From Canada, The Charging Cavaliers will use a scintillation detector to search for fractionally charged particles in the beam, and from Italy the team TCO-ASA will use a study the Cherenkov effect using a self-build detector read by SiPM devices.



In T11 the Cloud experiment will this year add the study of marine components (f.i. Iodine) in the nucleation process leading to cloud formation.

nToF

D. Macina: Running fine. Keep asking for a max intensity of 700×10^{10} protons for the dedicated bunches (had up to 780 in the past) and 300×10^{10} minimum for the parasitic ones.

AD

B. Dupuy reported on the AD status ([Annex 7](#)). Availability 98%.

During the technical stop inspection of the electron-cooling revealed poor conductivity of the demineralized water circuit of the collector. The resin filters were exchanged. Other inspections did not reveal any anomalies.

The ALPHA beam was moving horizontally, which was fixed by tuning an extraction kicker and First Line preventive intervention on DE0.DHZ45 power supply.

ELENA was operating with antiprotons and managed to decelerate the beam and keep it until the end of the second plateau. It was disturbed by a problem on the Horn PLC upgrade. This time was not lost; it was used for setting of the protons on the target through the screens (usually very disruptive for the users).

Comment from **E. Carrier** received by email: The problem was due to the spare power supply test, which proved to be incompatible with the PLC code of the original unit. The attempt to make a code common to both power supplies proved to be impossible and the initial code configuration was put back in place. A code compatible with the standby power supply is available in the event of a power failure.

AD Users

H. Wilkens: The ALPHA experiment is planning an intervention on their cryostat. Thus a reduced liquid helium request from the AD users.

SPS

V. Kain reported the SPS status ([Annex 8](#)).

The UA9 run was quite successful. There was an issue with CTRIM that were not accepted so no trims were possible during COAST. It was fixed by the LSA team within the UA9 run.

During the technical stop it was found that the polyurethane jack of QF.518 completely collapsed. It was fixed and realignment done. Upgraded DIP, BCT3 FESA class to version 3, SIS and some electronics elements. The BCT upgrade caused many issues:



-
- All BCT-related SIS interlocks were wrong and caused downtime (TIDVG dumped intensity, normalized losses...).
 - The SPS “Larger” page was not working until Friday.
 - Many applications needed release.
 - Certain things could/should have been discussed before with OP, for example sampling frequency change.
 - However, it is not easy to prepare better in the future

Fixed target beam was back later than promised (lunchtime on Thursday) because of an issue with a water leak of a magnet in TDC2. Since then the Fixed Target beam has improved transmission to above 98% and had a very good availability over the weekend, since last week 92.5 %.

Due to the realignment following the jack repair the orbit has changed and re-steering of the LHC transfer lines was required. On Monday an orbit correction of the extraction region was done, which needed further steering of the transfer lines.

12 bunch train was unstable during ramp due to power and software issue with 800 MHz. It was fixed by experts on Thursday.

COLDEX run with 288 bunches up to $1.5e+11$ ppb. Beam only in the afternoon due to PS RF issue.

Question from B. Mikulec: Concerning the BCT upgrade story, was the intervention coordinated with BI and CO?

A.: No, it was not, because it was supposed to be a simple and transparent change of a FESA class version from 2 to 3.

Comment from M. Gourber-Pace: It was not discussed between BI and controls and there is a lesson learnt for the future.

Comment from E. Carlier: We have a problem with MKP erratic events on PFN 6. The situation where the PFNs are charged without pre-pulse arriving should be strictly avoided.

Comment from K. Cornelis: To avoid this issue the MKP application will be updated to show more clearly what is programmed in the timing as injection events and how many kicks are enabled with respect to how many injections are requested with beam.

North Area

B. Rae: Apart from the SPS issue with the leak on TDC2 it was smooth running.

North Area Users

H. Wilkens: During the technical stop the NA64 experiment reconfigured from the setup for the invisible search for a dark photon, to the search for a visible decay of a new boson into e^+/e^- .



Extension of their program is motivated by the anomaly observed in 8Be^* at ATOMKI. For this it will run with $45\text{E}11$ protons on T2, which will be raised to $55\text{E}11$ protons by the end of the week.

HiRadMat

No report.

AWAKE

No report.

CLEAR

P. Skowronski (replacing **D. Gamba**, [Annex 9](#)). On Thursday finished installations for the plasma lens experiment. On Friday the beam was transported through the newly installed capillary. Still struggling with some control issues and CO is working on solutions. Since Friday evening performed set for irradiation tests.

TI

J. Nielsen: Nothing to report.

3. Debriefing of the ITS3

Linac2&Linac3

A. Berjillos Barranco reported for the linacs ([Annex 10](#)).

In Linac2 everything was completed as planned, the machine was closed at 16h and the beam was back at 17:30.

In Linac3 the stop was for the whole week and the beam was back on Friday.

LEIR

D. Nicosia reported for the LEIR ([Annex 11](#)). Most of the interventions were general inspections and all went smoothly.

PSB

D. Hay reported for the PSB ([Annex 12](#)). All interventions were successfully completed with exception of the installation of 2 BLMs at BR.BHZ52, where a problem with cable a extension was discovered. It will be fixed at the next opportunity when it is possible to access for 2h.

There were not enough keys to enter the machine and an additional box will be installed during YETS.



PS

F. Pedrosa reported for PS ([Annex 13](#)).

The Wire Scanner was replaced, and the vacuum recovery went well and faster than initially anticipated. The RF tests went well. It was expected that 17h to finish would be quite tight and eventually the machine was closed as soon the activity was completed around 18h. The BE-RF intervention had some minor setbacks, a flow regulator had to be replaced what was not in the initial planning. The TE-VSC team, apart from the tests foreseen initially, replaced 2 communication cards and a connector (which was discovered malfunctioning during the tests). The alarm level for one of the ventilation units had to be increased because it was already close to the limit, and a 24h stop is not enough to perform the filters exchange operation (no risk to wait until the YETS).

Only 14 out of the 45 activities reported completion of the works. **Please, once intervention is finished close the corresponding IMPACT and call the coordinator, or send a message.** Otherwise it is not known if the machine closure can proceed.

Comment from **B. Mikulec**: Operations needs to be informed as well about any activity during the technical stop that could potentially affect machine operation, in the tunnel and on surface. **As for the facility coordinators, the operations crew would appreciate very much feedback** on such activities in order to have a trace in the elogbook in case of issues after the restart with beam.

H. Damerau stopped the programmed power cut “ENNC2017-168”, which would have affected the PS beam controls (LLRF). The coordinators did not receive any information about this cut.

Question from **J. Nielsen**: Why the cut was cancelled?

Answer from **H. Damerau**: The power cut would have stopped the air conditioning (located in building 359) of the installations in building 353. This would have required to shut down part of the PS beam control equipment in building 353 with the associated risk of problems during the restart. As experts were not available for the restart, we have preferred to keep the equipment running.

SPS

D. Mcfarlane reported for SPS ([Annex 14](#)). Only 4 interventions reported back (same remark as for the PS; see above).

TE-VSC: All foreseen activities are completed, nothing major to report.

BE-BI: In TT10, exchange of a dead frontend electronic card for the BPM 101302. The corresponding channel is now working and the calibration is done. The TT10 BPM instrumentation is fully ready for OP. For EO- BPM in LSS4, installed a new polarisation compensator on one of optical system and a new interferometric set-up on the second optical system. It went smoothly.

EN-HE: The lift maintenances and the both interventions at BA1 and BA5 have been held with success. It was completed faster, but no information was transferred back to the coordinator so the accesses unnecessarily continued through other points.

TE-MSC:



-
- A small water leak has been found on a brazed junction of the MBA.61590. A proper brazing repair could not be performed in situ due to the inaccessibility of the brazed joint at this location. We could however temporarily (almost) stop the leak by hammering the copper around, and a kind of gutter with Kapton foils as to guide the remaining leaking flow (approximately 1 droplet/minute for the moment) directly to the ground put in place, as to protect the surrounding equipment (vacuum pump supply). The magnet will have to be replaced during the YETS.
 - Another water leak has been found in TT20, on the gasket of a water supply hose of the quadrupole QNLD.211500. The defective gasket has been replaced.
 - The quadrupole which gave the vertical orbit kick recently has been identified in position QF.51810. The single polyurethane jack was completely collapsed (top and bottom parts in contact) due to a degradation of one of the polyurethane pads which was progressively extruded between the piston and cylinder of the jack. The jack has been replaced, and the magnet has been put back in nominal position by our colleagues of the survey.
 - All the rest of the ring and transfer lines have been inspected and are OK.

MSC is presently studying a new design of mechanical jacks in collaboration with the survey team SU and the design office EN-MME, which doesn't use the polyurethane pads, as to improve the long term reliability of these jacks.

At 5h30 a team forced a door even though clearly instructed not to and the patrol had to be redone.

4. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

Comment from **H. Bartosik**: On Wednesday there will be a dedicated MD in the SPS using a coast cycle (crystal slow extraction). In parallel, when the SPS does not take beam during the MD, there will be measurements in the PS with the injection SEM grids. Therefore there will be no physics beams in both the PS and the SPS.

There will be a HiRadMat run in week 40.

SPS scrubbing MD in 2 weeks; **B. Mikulec** asked **H. Bartosik** to send the precise beam request to the injectors.

Comment by **V. Kain** concerning the DSO tests for the NA for the ions. The various coordinators are trying to find a date. It is not obvious now, as it is incompatible with various other activities (scrubbing run, proton physics end spurt). It should be defined in next year's schedule from the beginning.



Comment from R. Steerenberg: On Thursday the LHC will most likely request Xenon for MDs and a short physics run. Remains to be confirmed by the physics coordinator.

Comment from R. Alemany Fernandez: The part of the MD concerning crystals may go until Friday.

5. AOB

Maintenance of the doors YEA01.CLX=2010 from 08h30 Thursday September 28 until 17h00 Friday 29 September **was approved.**

Next Meeting: 2nd of October.

Minutes reported by P.K. Skowronski on 27th of September.



Summary of the 28th FOM Meeting

Held on Tuesday 3rd October 2017

Agenda <https://indico.cern.ch/event/669498/>

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Schedule update*
- 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 27th FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

G. Bellodi reported the status of the linacs ([Annex 1](#)).

It was an excellent week for Linac2 with 100% availability.

On the Linac3 side, several resets of the Thomson generator were needed. The source conditioning is still on-going. On Wednesday, there was a 1h downtime to revert the RF PLC code to an older version in order to remove a pulse blocking routine, installed the week before, which did not work as expected.

LEIR

N. Biancacci reported on the LEIR status ([Annex 2](#)).

The LEIR had an availability of 83% with main blocking faults related to RF and Linac3.

R. Alemany commented that most of the RF blocking faults were due to the development of a new interlock scheme preventing having 2 injections per cycle in order to keep the visitor platform open (both on the L3 and LEIR side). The RF team is presently working on the L3 side. RP has blocked for the moment visits to the platform, and all the team is following up the quick deployment of this new interlock to reopen the platform as soon as possible.



PSB

JF. Comblin presented the status of the PS Booster ([Annex 3](#)).

It was an excellent week with 99% availability. The main fault occurred on Wednesday at 5AM when the 2 MHz cavity of ring 3 tripped. The high-level RF Piquet was called and the total downtime was 1h46. The priority this week was given to the reduction of the emittance of the operational 8b4e LHC beams, in order to increase their brightness. On the MD side, it was a busy week with triple harmonic capture, dispersion measurements, ejection septum aperture scan... The MD on MTE to increase the intensity was on-going.

ISOLDE

L. Fadakis reported the status of ISOLDE ([Annex 4](#)).

On the HRS side, the VITO experimental line stopped taking beam (^{26}Na) on Wednesday morning.

On the GPS side, the beam ($^{140}\text{Nd}^{33+}$ $E=4.62\text{MeV/u}$) was sent to MINIBALL in XT01 on Wednesday afternoon. On Friday early afternoon users requested to change isotope, since their yield of ^{140}Nd was overwhelmed by ^{140}Sm . The machine scaled wonderfully and $^{142}\text{Sm}^{33+}$ was delivered by the end of Friday. The GPS availability was dominated by RF amplifier faults. Because of the last minute change of isotope requested by users, amplifier settings were suddenly changed while it would have required some conditioning.

ISOLDE Users

K. Johnston could not attend the meeting and sent the following report:

On GPS last week the main goal was to measure ^{140}Nd using Coulomb excitation at MINIBALL. This was compromised due to ^{140}Sm (the mother of ^{140}Nd) being produced at higher rate than expected and in the end the experiment was forced to change. This happened on Friday when ^{142}Sm – also part of the same experimental proposal – was set up and taken to the experiment. Since then the rates of ^{142}Sm have been good with the experiment forced to take lower than usual proton rate (0.2-0.5uA) so as not to overload the detectors at MINIBALL. The initial data look promising on ^{142}Sm and some of the new states which were looked for have been found. ^{140}Nd remains a problem however and this will require some target development to see if it can be produced sufficiently pure for 2018.

PS

M. Fraser reported the status of the PS ([Annex 5](#)).

It was a good week with 98% availability. The 8b4e beam horizontal and vertical emittances were reduced to 1.1 and 1.0 mm.mrad, respectively, for an intensity of $1.3\text{e}11$ ppb. After the CLOUD experiment reported low intensity, a T11 quadrupole was found with inverted polarity (cabling from the YETS). The intensity to T9 was limited to 3 spills per super cycle due to the reduced limits on RP alarm on PAXEA61N to protect the CLOUD work station. Investigations are on-going on the occasional POPS missing pulse occurring since Friday.

The nToF delivered integrated intensity is 10% ahead of schedule.



East Area

B. Rae said that the main issues were, as already mentioned, the CLOUD beam line quadrupole polarity inversion and the intensity limitation in T9. The wrong quadrupole polarity was not noticed earlier, as it was the first use of the CLOUD beam line since the YETS.

East Area Users

H. Wilkens said that users were happy and they had good time with Beam Line For School.

nToF Users

F. Macina said that users were happy.

AD - ELENA

P. Freyermuth reported the status of the AD ([Annex 6](#)) and ELENA ([Annex 7](#)).

It was a pretty difficult week for the AD with 3 main issues. One of the main power supplies tripped on Wednesday and required the intervention of the First Line. On Thursday night, the horn power supply tripped because of an interlock on the target area due to a drift of a position sensor, which was fixed on Friday morning. The recapture on the 300 MeV plateau started to degrade on Sunday, it was probably due to an issue with RF cables.

The ELENA H⁻ source was refurbished and a Pbar beam circulated last week at 35 MeV.

AD Users

H. Wilkens said that there was no issue to be reported from the users.

SPS

F. Velotti reported the status of the SPS ([Annex 8](#)).

It was a pretty good week for the SPS with an availability of 97% with no major faults. On Tuesday, a change of an insulation transformer on the 800 MHz cavities caused a stop of 45 minutes for all LHC beams, this should theoretically solve the incompatibility of certain cycles (e.g. LHC4) with other LHC beams, to be verified. Also, the BCS version of the 8b4e was taken in view of the LHC possible requests for week 40. On Thursday, following the NA users request, the SFTPRO intensity was raised in order to guarantee the requested sharing of 55-35-150. The intensity before extraction is now up to 3.6e13 p. During the night, a problem on SM2 came back and there was no possibility to deliver beam to COMPASS until the following morning, when the experts finally managed to solve the problem.



North Area

B. Rae said there were serious issues with the SM2 power converter and almost 2 days were lost for COMPASS, in spite of very massive support from TE/EPC. Finally it was solved without full understanding of the problem. Otherwise after the SM2 problem has been solved COMPASS also suffered from a scraper jaw positioning error that caused a significant increase of the beam halo. Fixed after diagnosis from STI and running again from Thursday 16:00. STI was asked to consign the motor until end of the data taking, repair will be done during the YETS. On Friday afternoon a 2.5 hour stop for the whole NA was due to a power converter fault after a wobbling change.

North Area Users

H. Wilkens confirmed that the COMPASS experiment had a difficult week. Na64 will finish on Wednesday and the intensity request on the T2 target will therefore be reduced.

HiRadMat

K. Cornelis said they were starting today.

AWAKE

There was no report.

LHC

J. Wenninger said it was one of the best weeks ever with up to $1.25e11$ in collision with the 8b4e beam and 4 fb^{-1} delivered ([Annex 9](#)).

CLEAR

There was no report.

TI

J. Nielsen said it was a good week with no major issue to report.

3. Schedule update.

B. Mikulec presented the new injector schedule version 1.5 for approval ([Annex 10](#)).



For what concerns the radiation survey during week 43, NA proton physics will be stopped at 6.00 on Monday 23/10.

From 23/10, 6.00 to 24/10, 10.00: most of the proton beams stopped except LHC production beam during LHC fills (with minimum number of beam dumps!).

From 24/10, 10.00 to 24/10, 16.00: All proton beams stopped.

From 24/10, 11.30 to 24/10, 16.00: All beams stopped (including ions).

24/10, 11.30: Machines in access mode.

24/10, 12.00: RP access for radiation survey.

24/10, 16.00: End of access, normal beam schedule can restart.

The main changes to the schedule wrt. the previous version are:

The LHC MD4 was moved from week 43 to week 47 and consequently, the Wednesday injectors MD was moved from week 47 to week 43. The indication of "Xenon ions to LHC" that will take place on Thursday October 12th has been added.

After a comment from **R. Alemany**, it was agreed that the week 43 injector MD could take place in week 49 instead, as no high intensity is needed.

The new 1.5 schedule version has been approved with this modification.

F. Pirotte added that DSO tests will take place on the 16/10 AM in the North Area and on the 23/10 on the AWAKE electron dump.

4. AOB

B. Mikulec gave details on the van der Meer beam request. The LHC experiments requested to have a VdM scan at injection energy as part of the physics program for the 900 GeV high beta star run. Therefore, the injectors should prepare injections of 8 bunches into the LHC with a bunch spacing of 525 ns that would require the use of the 4 PSB rings. The run is planned for the last week of the 2017 LHC run (week 49). The beams should be as Gaussian as possible, with slightly higher intensity than usual (around 1.2×10^{11}).

Next Meeting: Tuesday 10th October 2017.

Minutes reported by [JB. Lallement](#) on 5th October.



Summary of the 29th FOM Meeting

Held on Tuesday 10th October 2017

Agenda <https://indico.cern.ch/event/671627/>

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Schedule update*
- 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 28th FOM](#) were approved with comments from **F. Pirotte** concerning the coming DSO tests (NA ion interlock and AWAKE electron gun).

2. Status of the machines.

Linac2 & Linac3

F. Di Lorenzo reported the status of the linacs ([Annex 1](#)).

There was nothing special to report on Linac2 with 100% availability over the week.

Linac3 had a 99.5% availability due to few source RF generator trips that were solved by simple resets.

LEIR

R. Alemany reported on the LEIR status ([Annex 2](#)).

It was a busy week at the LEIR with many MDs and an improved injection efficiency (up to 8×10^{10} charges) approaching last year's performances (with lead). The operation was perturbed by three main issues related to the CRF41 cavity and to the B-train generation. New electronics was installed on the ETL.MSF30.INJ SEMGrid giving the possibility to have time resolved measurements (4 us time slices). On Thursday, the record transmission efficiency with Xe beam to SPS was broken.

Few issues are still to be followed up: Ripple on ETN.BHN10 acquisition, unstable phase offset between LEIR and PS, wobbling beam and PS flat bunches....

PSB



V. Forte presented the status of the PS Booster ([Annex 3](#)).

It was a very good week for the PSB with 99.6% availability. Several beams were finalized: 8b4e_BCS for LHC was inserted in the operational list (changing status/name from MD), MD2240_SPSSCRUB beams (BCMS25, LHC25_A and LHC25_B versions) were played by the PS on Friday and ready to be taken by the SPS, STAGISO, MD_GPS_H2_PS MTE beam with ISOLDE-like intensities ($\sim 660 \times 10^{10}$ ppr, 8-8.5 and 7-7.5 μm in horizontal and vertical emittance respectively) and the 4-ring version of LHC_VdM (AOB from last week) was also prepared.

The major fault of the week was the failure of the transverse feedback cooling system, which generated ~ 19 minutes of beam stop on Saturday morning. Few minor faults occurred on extraction bumpers, septum and kicker. A short stop should be planned next week for an intervention to fix the issue with the BT1.SMV10 drift.

There is also a recurrent issue related to the Tomoscope and the number of available licenses for Mathematica. **B. Mikulec** commented that a short term solution would be to get 2 more licences, the long term solution being to translate the FORTRAN and Mathematica codes in an open source language. For getting more licences, **A. Bland** said it should be discussed with the IT licence manager. **M. Gourber-Pace** added that the FORTRAN part could be re-written in Python, which is supported by CO and **H. Damerou** said that Mathematica only provides the graphical interface and could be replaced by a code in Java. **C. Rossi** added that **A. Butterworth** is already working on replacing the FORTRAN part. The budget question for the 2 additional Mathematica licenses will be followed up by **C. Rossi**.

ISOLDE

M. Lozano reported the status of ISOLDE ([Annex 4](#)). It was a very good week for ISOLDE.

On the GPS side, 142Sm beam was sent to Miniball at 4.62 MeV/u until Wednesday. The run was extended by one day due to the target increase yields found by the target team on Wednesday morning. There were MDs since Thursday and a new target was installed.

On the HRS side, CRIS started to take radioactive Ga beam from Friday before coming back to protons and neutron converter on Sunday. CRIS run stopped on Monday. The target was being exchanged.

E. Siesling added that they will request STAGISO beam on HRS.

ISOLDE Users

There was no report.

PS

I. Efthymiopoulos reported the status of the PS ([Annex 5](#)).

It was a very good week with 98% availability. The list and details on delivered beams and MDs that took place were given.

The issue with POPS failing to pulse for few cycles continued at the beginning of the week. The intervention on Tuesday to exchange a communication card did not solve the issue. It was finally decided on Thursday to switch to the old pulse B-train system since when smooth operation resumed.



The EPC experts are following up the issue and may want to switch back to the new WR system at some point. The intensity limitation to T9 (3 spills/SC) will be kept until the end of the proton period, as the PAXEA61N monitor remains on low thresholds set from RP (corresponding to a permanent working area for the CLOUD team). Some transient instabilities were observed for the MD1-high intensity beam for SPS scrubbing MD (mainly in the V-plane around extraction). Changes in the vertical chromaticity improved things (to be followed up).

The optimization of the Xenon beam in view of the ion physics program for the LHC and NA is ongoing.

The ToF integrated delivered intensity is almost 10% ahead of schedule.

East Area

B. Rae said that it was a very stable week.

East Area Users

H. Wilkens said that the present number of cycles in the supercycle is fine until the end of the year.

nToF Users

F. Mingrone said that a new experiment started yesterday in EAR1.

AD - ELENA

L. Jorgensen reported the status of the AD ([Annex 6](#)).

It was a very stable week.

The AEGIS experiment had a vacuum leak on Wednesday and had to do a partial warm-up of their system. It then became necessary to do some steering on the ALPHA line on Friday morning and on the ATRAP2 line on Monday morning. On Friday night there was a problem with a vacuum valve at ASACUSA, which was solved by the vacuum Piquet. A NIM crate power supply was replaced and connectors cleaned and sprayed with contact spray to try to get rid of the instability in the LLRF causing smaller numbers of ejected Pbar.

T. Eriksson reported the status of ELENA.

The priority is given to deliver H⁻ ions to the Gbar experiment. A pretty good intensity was reached at the beginning, but it started to slowly degrade. The issue is not understood yet and it will be investigated this week. The Ecooler will be ready for installation in ELENA in December.

AD Users

H. Wilkens had nothing to add.

SPS



K. Cornelis reported the status of the SPS ([Annex 7](#)).

The SPS had an availability of 93.5%. Main issues were related to Fixed Target cooling problems, which are not fixed yet, as the replacement of the flow switch in T6 would take too much time. The intensity on T2 was reduced on Thursday from 50e11 to 20e11.

A blow-up was observed on the 3rd batch last bunch when they switched to 4 batches with BCS beam for LHC and the third injector kick had to be slightly delayed. The Xe beam for the LHC was prepared on Thursday and Friday.

HiRadMat had an extensive week.

The Scrubbing run with 2e11 ppb last 24 hours happened as scheduled.

B. Mikulec added that the high intensity MTE version still gives large emittances. **K. Cornelis** said that they could take it as it is now, but **H. Damerou** confirmed the beam was not ready yet in the PS. **F. Tecker** (PS supervisor) will inform the SPS operation as soon as it will be ready.

North Area

B. Rae said that on Friday morning an un-understood RP veto cut the H4 beam. It was quickly fixed, presumably due to a REMUS problem. The Firstline was called twice this weekend for 3 SF problems in the NA62 Beam and for the TRIM1 on K12.

North Area Users

H. Wilkens said that users suffered, as usual, from the supercycle modifications due to HiRadMat.

HiRadMat

There was no report.

AWAKE

There was no report.

LHC

M. Giovannozzi said that they were running fine with the new BCS beam. They will take the Xe beam on Thursday and Friday for 3 shifts and then switch back to the BCS beam. Since the solenoid is used, there is a clear reduction of the steady state losses, but there were no more dumps due to 16L2. The solenoid effect should still be clarified.

CLEAR

There was no report.



TI

There was no report.

3. Schedule update.

B. Mikulec presented the [injector schedule](#) (version 1.5).

Concerning the MDs, **G. Rumolo** could not attend the meeting and sent the following information:

Concerning the MD tomorrow please flag for the PS physics users that in the morning there will be an MD (tagged as dedicated in the [MD schedule of Week 41](#)) that will stop all EAST users. Other than that, please note that there will be three parallel MD users in the PSB and two in the PS both in the morning and afternoon, which we had to allocate in order to satisfy all the MD requests of the week. This might lower the duty cycle for the physics users both in PSB and PS tomorrow from 8:00 to 18:00.

In the SPS we will carry on with the high intensity run (~2e11 p/b injected into SPS with both standard and BCMS users), which successfully started yesterday.

4. AOB

The maintenance of the door YEA01.PSR=152 from Thursday 12/10 - 8.30 to Friday 13/10 - 17.00 was approved.

R. Alemany said that the LEIR visitor platform was re-opened last week. The Linac3 side interlock will not be developed. The radiation level in the area will be limited by the LEIR SIS.

Next Meeting: Tuesday 17th October 2017.

Minutes reported by [JB. Lallement](#) on 12th October.



Summary of the 30th FOM Meeting

Held on Tuesday 17th October 2017

Agenda (<https://indico.cern.ch/event/673244>)

- 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](#).

1. Follow-up of the last FOM

Minutes of the last meeting were approved.

2. Status of the machines

LHC

J. Wenninger presented the status of the LHC ([Annex 2](#)). A good week with an average of 0.5 fb^{-1} delivered per day. Availability was 87%; there were some minor issues with cryogenics. Today CMS measured a world record instantaneous luminosity of $2.12 \text{ cm}^{-2}\text{s}^{-1}$. Until now the LHC delivered integrated luminosity of 37 fb^{-1} , what is 10% ahead of the schedule. If this rate is kept until the end of the run then it is likely to overcome 50 fb^{-1} , whereas 47 fb^{-1} was scheduled. The 36 hours Xe run was very successful.

Linac2&Linac3

R. Wegner provided by email the status of the linacs ([Annex 3](#)).
*'Excellent week for Linac2 with 100% availability.
For Linac3 a good week, only the source's Thomson RF generator tripped several times.'*

LEIR

S. Pasinelli reported for LEIR ([Annex 4](#)).

Issues:

- Missing BTrain (no Bup & Bdown), fixed by a crate reboot.
- ETL.BHN10 interlock; the investigation is still on-going.



- ETL.QNN60-EJ was not following the reference setting because the defined MAX value was not correct and the current asked for the power supply was too high.
- Several CRF41 trips, sometimes the remote reset didn't work and a specialist had to intervene.
- E Cooler in Local mode and OFF due to glitches on the power network.

Main activities:

- EARLY Beam to LHC for Xe collisions and crystal collimator MD.
- EARLY beam to SPS for partially stripped ion Xe³⁹⁺.
- NOMINAL beam for instability studies reached $7.4 \cdot 10^{10}$ injected ions with 7 injections.
- Investigation on Flat & Wobbling bunches. Two different types of oscillations have been seen: dipolar and quadrupolar. The dipolar one comes from the difference between the RF frequency and the beam frequency. The quadrupolar mode (the donut effect) is not yet clear.
- Investigation on fluctuation of the extracted intensity: the efficiency of capture and acceleration in LEIR increases when the IPM (Ionization Profile Monitor) is switched on.

PSB

G.P. Di Giovanni presented the status of the PS Booster ([Annex 5](#)).

A good week and RF problems during the weekend. Availability was 95%.

On Saturday, the 8b4e_BCS beam was lost sometimes in Ring2 at capture. The RF piquet replaced few components of the HLRF to try to disentangle the origin of the problem causing some downtime for the PSB or having the PSB running in degraded mode. Finally, the RF experts could not find anything unusual and the problem seems to have disappeared.

On Sunday, the 2 MHz cavity in Ring3 started tripping regularly. A coupler was exchanged by the expert, but it did not solve the issue, as around 3AM on Monday the problem re-appeared. An access Monday morning was needed, and the exchange of the final blower solved the problem.

The issue of the drift of the BT1.SMV10 power converter is still not solved. This requires continuous monitoring of the extracted trajectories, re-steering or calling the TE-EPC expert to retune the converter. This is likely the cause for the blow-up of R1 emittance reported by the LHC. TE-EPC will attempt the repair during next week's radiation survey.

A first version of the VdM beam with 4 rings for the LHC special run was prepared and transferred to the PS. The high-intensity MTE beam (up to $2.5 \cdot 10^{13}$ ppp) for a special run to test the equipment with SHIP-like intensities in the PS and the SPS was optimized.

ISOLDE



E. Siesling reported the status of ISOLDE ([Annex 6](#)). Very busy, as all the lines were running in parallel.

GPS had 96% availability. Vacuum gauge for sector GLM10 had to be exchanged.

REX-HIE had also 96% availability. 7GAP2 preamplifier broke and was exchanged.

HRS had 98% availability. Trips of HRS.QP330 and HRS series 700 and 800.

ISOLDE Users

K. Johnston provided the report by email.

'On GPS STAGISO protons were taken on a Sn target for Cd beams which were delivered for solid state physics. This was an excellent run with many systematic measurements taken on multiferroic, solar cell and semiconductor materials. Although the data will take a while to analyse, the users are extremely content with the physics output from this week.

On HRS NORMHRS beams – in a batch mode – were taken for the production of Sn beams for HIE-ISOLDE/Miniball. This was quite a tough setup – the first on HRS this year for HIE-ISOLDE – and the laser ionisation scheme took longer to find the desired efficiency than usual (an alternative scheme was tested which should have been more efficient but there were errors in the literature, so the traditional scheme was in the end favoured). Once beam was delivered to the experiment the intensity has been excellent, although some problems at the experiment have been an issue.

Nonetheless, by taking one more night tonight (Monday) they should be able to essentially complete the planned programme. The users would like to especially thank the support received on Friday night for the work on the 7-gap which saved the run. The RF group – and Erwin - did a great job. In addition, many thanks to the booster for delivery of two different type of beams within the constraints required for the experiments. This week has been the 50th Anniversary of beams at ISOLDE and it has been a demonstration of the diversity of the experimental programme and also the terrific technical support that all users at ISOLDE receive to achieve their physics goals.'

PS

F. Tecker reported the status of the PS ([Annex 7](#)). A relatively good week with 91% availability.

Faults:

- During the maintenance of the access system one of its fuses blew (most probably unrelated to the maintenance works) and a patrol had to be redone.
- A spare 10 MHz cavity broke, and to avoid running without any spares over the weekend it was decided to fix it on Friday, what required access.
- FTN.BHZ403 power converter (affected only nTOF)
- POPS, PFW

Activities:

- Beam for scrubbing sent to SPS.
- Xenon (fully stripped) sent to EAST dump.
- Optimisation of MTE with $2.5 \cdot 10^{12}$ ppp.



- VdM beam has higher emittance than requested: $2.4 / 2.1 \mu\text{m}$ at injection and $2.5 / 2.1 \mu\text{m}$ at extraction.

Comment from **J. Wenninger**: These numbers have to be confirmed because on yesterday's meeting with the experiments new values were quoted.

Comment from **B. Mikulec**: Maybe the setup should be started later, when the requirements are stabilized.

Comment from **J. Wenninger**: I will try to write the values down and we stick to them.

Question from **B. Mikulec**: Is the PS currently running on White Rabbit B-train transmission?

Answer from **F. Tecker**: We are using still the old transmission of the B-up-B-down signals. **A. Beaumont** had informed me that they were not able to reproduce the problem on the WR transmission. Therefore he proposes to switch back during this week to the WR transmission in order to investigate if the rare problem of a missing POPS cycle would reproduce.

East Area

B. Rae: All good.

East Area Users

No report.

nToF

D. Macina: Nothing to report.

AD

T. Eriksson on behalf of **B. Lefort** reported on the AD status ([Annex 8](#)). Nearly perfect availability this week (above 99%). Injection septum had to be reset several times. Some instabilities detected on ALPHA's line that were corrected by steering.

ELENA

T. Eriksson: It was not so good at ELENA. Attempted to improve stability and intensity of the H⁻ beam from the source, including help from the Jülich experts, who built the source. The new settings seem to increase the rate of breakdowns. In turn, they lead to failures of the filament power supply. Already a few units had to be exchanged and there are not many spares left. Currently restarting the source to continue ELENA commissioning, which on certain days will be also done with p-bars.

AD Users

No report.

SPS



V. Kain reported the SPS status ([Annex 9](#)). Availability was 92%. The biggest issue was the interruption of the chilled water for the septa (2.1h downtime).

BCMS beam with the pushed intensity for high intensity run had issues:

- Losses at transfer, injection and flat-bottom of 15%.
- Emittance blow up.

For partially stripped Xe ions (Xe39) only 8% survive acceleration.

On the other hand, the fully stripped Xe was very efficient and thanks to a small emittance the intensity was reduced to 1.5×10^{10} ions per bunch.

HiRadMat finished its last run yesterday.

North Area

B. Rae: A good week.

North Area Users

No report.

HiRadMat

No report.

Comment from **V. Kain:** It was the last HiRadMat run this year that just finished.

AWAKE

No report.

Comment from **B. Rae:** AWAKE will have DSO tests for the electron source/line on next Monday (October 23) afternoon. Hardware commissioning of the electron source/line will then start end of next week for several weeks.

TI

J. Nielsen: The issue with the BA2 chilled water was due to a high temperature interlock. It was longer to restart because there was another interlock on the user side that had to be reset manually. During the weekend there was a strange problem with a server delivering data from the Technical Network: data packages were not arriving and causing communication interruptions.

3. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

In the SPS a UA9 run is ongoing.

G. Rumolo reported that on Wednesday, in the SPS there will be a dedicated MD, during which there will be no NA beams.



On Monday, there is the end of the proton run for the NA. All proton beams will be stopped at 6am with exception of LHC fills. On Tuesday, also the ion beams are stopped for the radiation survey. Please keep in mind to avoid sending beams to the dumps before the radiation survey.

4. AOB

Maintenance of the access point YEA03.PSR=151 from 08h30 October 19 to 17h00 October 20 was **approved**.

There will be interventions on Telecom and Tetra from Thursday 19 October to November 17 with exception of October 24, when the radiation survey is scheduled. In case an access is needed please call the TI operators who will inform the installation team that will immediately put it back to operation. The system will be off only during working hours (during the nights and weekends it will be operational).

Next Meeting: 24th of October.

Minutes reported by P.K. Skowronski on 18th of October.



Summary of the 31st FOM Meeting

Held on Tuesday 24th October 2017

Agenda (<https://indico.cern.ch/event/674478>)

- 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](#).

1. Follow-up of the last FOM

Minutes of the previous meeting were approved.

2. Status of the machines

LHC

M. Giovannozzi gave the LHC status. This should be a standard week with the exception of Thursday, when in the morning high beta optics will be tested and afterwards a special fill for ATLAS calibration (150 nominal bunches separated by 525ns to avoid any encounters in the straight sections) are scheduled.

Comment from **F. Tecker**: The Van der Meer beam with 4 bunches spaced by 525ns was taken by the PS. The emittances are 2.5/2.1 μm rad H/V. The SPS will measure the emittance and an eventual further tuning can be done on the PS/PSB side.

Comment from **M. Fraser**: It was not yet sent to the SPS.

Question from **B. Mikulec**: During previous meetings **R. Steerenberg** and **J. Wenninger** commented on the requested beams for the special LHC runs at the end of the year, which were not yet fully defined. Are they already defined?

Answer from **M. Giovannozzi**: This needs further discussion.

Comment from **R. Steerenberg**: There are ongoing discussions to give extra MD time to the LHC at the end of the run, so it is possible that additional requests for special beams will be placed.



Linac2&Linac3

J.-B. Lallement provided the status of the linacs by email. Slides are in [Annex 2](#).

Linac2: There was only one minor issue this week. On Tuesday afternoon, for an unknown reason, the amplitude of the first DTL tank went down generating losses downstream. It was solved by the RF team switching the tank amplitude command in local (15 mins downtime).

Linac3: Overall a good week with some source pulse to pulse instabilities (especially during the second part of the week) and few source RF generator resets.

LEIR

S. Hirländer reported for LEIR ([Annex 3](#)) Not a bad week, availability was 94%.

There were 2 problems

- A broken PCB had to be exchanged in the electron cooler.
- Power converter ER.CRF41 tripped, however, the piquet was investigating ER.CRF43 instead. When it was clarified a simple reset solved the issue.

The injected beam intensity was increased to $3e10$ charges (a new record) thanks to transfer line optics rematch and the source tuning. Increase of ejection intensity to $5.6e10$ charges for NOMINAL beam is also thanks to RF tuning.

PSB

B. Mikulec presented the status of the PS Booster ([Annex 4](#)). Excellent week with only little downtime due to the following faults:

- Monday morning (last week) access was needed to repair a ventilation unit of the R3 C02 cavity.
- On Wednesday, the RF team had to intervene to solve a Transverse Feedback cooling issue
- Firstline intervention for a BTY line quadrupole (it influenced only ISOLDE).
- Saturday morning all C16 cavities tripped with an 'air flow' fault. The HLRF piquet had to exchange a ventilation power supply (1h20m downtime for certain beams).

Many MDs were again performed last week with the involvement of several groups, and for the first time the Finemet cavity was successfully used for beam splitting (production of an h2 MTE-type beam). New request for Roman Pots beam MD_LHCINDIV_LowInt_lowEmit: quick check confirms transverse emittances around 0.5 mm mrad for $\sim 10E10$ p on R3 and it can be taken by PS. All beams were stopped this morning at 6AM to prepare the RP survey after the stop of the NA proton run; only exceptions are LHC fills.

Today there will be an intervention on the BT1.SMV10 septum to cure drifts of R1 trajectories and to connect BLM to investigate losses.



ISOLDE

J. A. Rodriguez reported the status of ISOLDE ([Annex 5](#)). Availability was 93%. During the week ${}^9\text{Li}^{3+}$ at 8.0 MeV/u to the Scattering Chamber (XT03) was set up, which turned out to be very difficult. Main Issues:

- Lower yields than expected in the target (probably due to the material chosen for the ion source).
- Difficult setup of the REX-TRAP because of the low mass of the ion.
- Gradient of SRF cavities pushed very high: quite a few trips of two of them.
- Problems with the movement of the target holder in the experimental station.

From Wednesday to Friday and from Monday to Tuesday ${}^{12}\text{C}^{4+}$ at 8.0 MeV/u beam was delivered to the users.

ISOLDE Users

K. Johnston: The physics aim in week 42 was to perform transfer reactions with a ${}^9\text{Li}$ beam – to study ${}^{11}\text{Li}$ – at 8MeV/u to the scattering chamber at XT03. Li is a very light ion and extremely challenging to transport through the machine, but the run was more difficult than expected. In addition to transporting the beam – for which the users are very grateful to the whole operations team who performed heroics to achieve this – there were issues with the experimental setup, which delayed the start of the experiment, and the target/ion source were under-performing: initially thought to be solely an ion source problem, there are some doubts about the target itself; standard isotopes are not being well produced. In the end, with a factor of 10 less yield than expected, the experiment can only perform a proof of principle run – which has been successful – but to achieve the final physics goal this experiment will have to be re-scheduled in the future.

PS

F. Tecker reported the status of the PS ([Annex 6](#)). Good week with 97% availability and only 1/3 of the downtime was due to the PS faults:

- POPS trip
- Some short trips of 10 MHz cavities caused 0.5h down time, and additionally 1h of degraded beam for AD because the spare cavity used as the replacement of the faulty one didn't follow the requested RF function. This has been fixed by now.

B-train distribution was switched back to the White Rabbit and the issue with POPS occasionally missing a single cycle was observed again. However, the experts think that they found the cause and it should be fixed today.

High Intensity MTE ($\sim 2.5 \times 10^{13}$) was sent to SPS on Wednesday.

The rate of the delivered intensity to nTOF is still above the originally assumed one and already 94% of the target was accomplished.



East Area

B. Rae: A good week, nothing to report.

East Area Users

H. Wilkens: I confirm a good week in EA. On the user meeting a possibility to have more cycles, but with lower intensity to reduce the amount of radiation alarms, was discussed.

Comment from F. Tecker: The request was passed to the operators.

nToF

D. Macina send an email that there was nothing to report for nTOF.

AD

B. Dupuy reported on the AD status ([Annex 7](#)).

Availability was 99.8%.

A software problem did not allow to finish the stochastic cooling MD on Monday (impossible to put AD in PAUSE mode). Since Friday important variations in deceleration are observed, which are still under investigation.

Following several breakdowns of the ELENA H⁻ source, it is out of spare components for protection circuits, and now it can work only with p-bars from AD.

AD Users

H. Wilkens: BASE wanted to refill the trap these days, but due to their issues they postponed until the next week.

SPS

H. Bartosik in place of **F. Velotti** reported the SPS status ([Annex 8](#)).

Availability was 93%.

Main downtime due to:

- DSO tests for NA.
- Control of the main PCs caused wired trips (bug which is being fixed) of the QF and QD as consequence of dV/dt threshold exceeded. EPC experts remove this threshold, as not harmful for the converter itself.
- Server in BA4 was not sending the right functions to the PCs. This also included one of the extraction sextupoles provoking high losses at the ZS and blocking the extraction. Prompt reaction of the shift crew stopped the SE. Reason is not yet understood.
- BCT4 published data with shift of 200 ms - this caused the PROBE-BEAM-FLAG to be always true. A reboot fixed the issue.
- Interventions on Full Economy mode.



The 2017 proton run for the NA officially ended with about 10% more protons delivered to T6 than foreseen at the beginning of the year. The ion beam setup for the NA has started. On Wednesday, during the dedicated MD the high intensity MTE beam was injected into the SPS. It was to check for any unexpected showstoppers with the MTE scheme with the intensity needed for the future beam dump facility experiments at the SPS (e.g. SHiP). As expected the transmission was lower compared to the operational Fixed Target beams due to the higher vertical emittance and the limited vertical acceptance of the SPS. Apart from this expected degradation, no other immediate issues were encountered on the SPS side. Up to $4e11$ ppp could be accelerated to 30 GeV in the SPS, i.e. beyond transition crossing.

Comment from R. Steerenberg: In view of the soon to be taken IEFC decision whether some machine elements for the CT extraction can be removed from the PS during LS1, the input about possible emittance reduction from the Linac4, PSB and PS needs to be provided.

Comment from R. Alemany Fernandez: The setting up of the ion beams was finished within 16 hours while it was scheduled for 24 hours. Thanks to all the teams involved.

North Area

B. Rae: Last week was fine. We got ion beams fast to H2 and H4, while H8 is still outstanding.

North Area Users

H. Wilkens: The completed proton run was very successful and I would like to thank all the machines.

AWAKE

No report.

TI

R. Ledru: Nothing to report.

3. Schedule Updates

B. Mikulec presented the latest version of the [injector schedule](#).

At the moment the radiation survey is being prepared. The protons were stopped already yesterday, with the exception of LHC fills, and ions will be stopped at 11h30. No LHC filling from 10AM until 4PM.

Question from D. Mcfarlane: Is the 2018 schedule already available?

Answer from R. Steerenberg: The SPSC was discussing the very last requests and it should be published very soon.



4. AOB

Maintenance AD Access Point YEA01.ADR=193 from Thursday October 26 08h30 to Friday October 27 17h00 **was approved.**

From November 1st **S. Hirländer** will replace **P. Skowronski** in the function as scientific secretary. B. Mikulec thanked P. Skowronski for his important contribution. From now on please send requests and comments concerning the FOM to **S. Hirländer** and **J.-B. Lallement** in parallel.

Next Meeting: 31st of October.

Minutes reported by P.K. Skowronski on 25th of October.



Summary of the 32nd FOM Meeting

Held on Tuesday 31st October 2017

Agenda <https://indico.cern.ch/event/676462/>

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule update*
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 31st FOM](#) were approved.

2. Status of the machines.

LHC

W. Hofle said the LHC was currently in access to fix several issues. They will continue taking the 8b4e beam, which gives good luminosity performances, until the end of the week. Next week, they will certainly request a VdM beam with 150 ns spacing. **B. Mikulec** said that they should give a pre-warning few days before they ask a beam that was not prepared yet. **K. Cornelis** added that, if possible, they should ask for already existing beams.

Linac2 & Linac3

D. Kuchler reported the status of the linacs ([Annex 1](#)).

The Linac2 had an availability of 97.8%. There were two main problems. On Tuesday, there was an issue with the feedback loop of tank1, which could be partially cured with some tuning, but still requires some time for an intervention. During Friday night, a power glitch stopped some equipment and the reference amplifier needed to be replaced (2h13min downtime). Over the weekend the PSB suffered from unstable pulses for long beams. It was solved by retuning the RF amplifiers on Monday.

There is a request from the linac RF team to have some tests for 4-8 hours at the end of the run. **A. Berjillos** said that these tests could be scheduled on the 18/12.



Concerning the glitch on Friday, **C. Wetton** said that RTE and SwissGrid were contacted and they did not see any glitch on their networks. It appears that it was an internal glitch, possibly caused by the equipment trip.

The Linac3 had a pretty good week with 99.7% availability. There were few source RF generator trips. The source stability was improved and the beam current at the end of the linac is between 30 and 35 μA .

LEIR

N. Biancacci reported on the LEIR status ([Annex 2](#)).

It was a good week for LEIR with 98.3% availability. There were several trips of BHN30 that required an intervention from EPC. They fixed the problem by resetting the interlock and communication card controls. The ER.KFH32 trips were investigated by specialists. Some noise coupled on the main switch pickup triggered an interlock. Masking has been done, but it will need further investigations. The ETL.BHN10 ripple issue requires an intervention that will take place on Wednesday during the SPS MD.

PSB

G.P. Di Giovanni presented the status of the PS Booster ([Annex 3](#)).

It was a good week with 97.4% availability and main downtimes due to Linac2.

On Friday lower efficiency at capture in R1 was observed for all high intensity beams with $I > 500 \text{E}10$ ppr. No issue was found with the PSB equipment or its setting and the Booster could anyway supply all physics users with nominal performances. Over the week-end the PSB operators noticed losses of intensity along the Linac2 pulse and the linac RF settings were adjusted to recover good transmission. On Monday morning, linac RF experts re-set the original configuration, as the modified settings were found not to be optimal, and **A. Findlay** reworked the PSB settings (qstrips, injection pos./angle,..). While in theory the Linac2 and the PSB should have been back to the configuration when the issue was observed, the PSB recovered its initial performances. The origin of the problem remains unknown.

ISOLDE

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

On REX-HIE, the issues experienced last week with RF cavity trips continued this week. A new target was installed on GPS and the next HIE experiment is being prepared.

On HRS a new target was installed on Monday and the line was set up during the week. COLLAPS had a bumpy start due to a series of problems: no He gas in RFQ, no protons from PSB, interruptions for interventions in HT room and RILIS issues. The run finally started on Saturday and went pretty well all over the weekend.



ISOLDE Users

K. Johnston said that the HIE-ISOLDE run taking 9Li to XT03 finished on Thursday morning. As discussed at last week's FOM this was a difficult run, but some new data were nonetheless collected, whether they have sufficient statistics remains to be seen in the post analysis.

On HRS, laser spectroscopy was performed on a wide range of neutron rich and neutron deficient Sn isotopes at the COLLAPS experiment. The start-up for this run was difficult with many overlapping small problems, but once the beam was delivered on Saturday afternoon the conditions were quite stable and the yields and purity from the target were very good. The hyperfine parameters of Sn from ^{108}Sn – ^{134}Sn were successfully measured and the collaboration is very satisfied; they completed their experimental program.

PS

M. Fraser reported the status of the PS ([Annex 5](#)).

It was another smooth week for the PS with an availability of 97%. Special LHCINDIV beams set up in the PSB were delivered to, or prepared for set-up in the SPS, including the multi-bunch VdM beam and a low emittance (0.5 μm injected, 0.7 μm extracted) and low intensity ($10\text{E}10$ ppb) version. The NOMINAL LHC ion beam (2b, 100 ns) was set up in the PS and is ready for the SPS to take at about $6\text{E}10$ charges. The bug observed on the WR transmission of the B-train measurement appears to have been fixed on Tuesday by TE-MS-C-MM with no further missing POPS cycles (to be confirmed). The new B-train measurement system was also tested on clones of most of the operational beams with success. Very promising tests of the BGI were made in the PS on Friday. The LLRF settings issues with transverse feedback causing problems to MD users is being followed up by the RF team. The integrated intensity delivered to nToF is 9% ahead of schedule (already 98% of the 2017 request).

East Area

B. Rae said it was a good week.

East Area Users

H. Wilkens said the users were happy.

nToF Users

D. Macina said that nToF users were fully satisfied.

AD - ELENA

L. Bojtar said it was a very good week for the AD.

There was an issue last night with the C02 cavity that could not be understood, as all checks done did not highlight any issue. The operation resumed this morning at 8.00 with the problem not understood.



T. Eriksson said they still had some issues with the ELENA H⁻ ion source. They will take a pbar shift on Friday.

AD Users

H. Wilkens said there was no issue to report.

SPS

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

It was a good week with 96.5% availability. The Xe run for the North Area started on Monday and the Xe beam extraction at 358 GeV/z was set up. The beam reached the T2 target in the evening and was ready for the secondary beam line physicists to set up for the experiments. Since Wednesday night, the users of H2 (NA61) keep reporting vertical drifts of the beam position, while the TT20 transfer line trajectory up to the T2 target seems stable. Despite investigations from both the SPS side and from the secondary beam line specialists it is not yet understood what is causing this drift. For the moment, the work-around consists in vertical steering before and after the T2 target until the beam is found back in H2. Apart from this, beam availability in the SPS was rather good with only minor interruptions. The biggest downtime (2 hours) was caused by a parallel MD cycle, which triggered the primary ion interlock on Thursday afternoon. The ZS extraction septa suffered from high spark rates when the 8b4e beam is put into the sequence in preparation for LHC filling. After a few cycles, the spark rate is back to normal levels. However, the ZS tripped a couple of times during the weekend. LHC filling itself went rather smooth. In addition to the normal physics fills with the 8b4e BCS beam, a special version of the INDIV beam with 2x4 bunches was sent to the LHC for a 150 bunch calibration run requested by ATLAS. The spill quality was affected by quadrupole ripple. As the 50 Hz compensation is not available, the chromaticity was increased in order to minimize the spill sensitivity to QF ripple.

North Area

B. Rae said that the only problem of the week was due to the issue of beam drift already mentioned.

North Area Users

H. Wilkens said that the spill quality issue was solved in time for the experiment start. As NA61 is a bit late on the statistics they will continue until Monday and the change of momentum will be delayed. As a consequence, the other experiment schedule will be affected. The nucleon experiments needing lowest energy, their rescheduling will be discussed.

HiRadMat

There was no report.

AWAKE

K. Cornelis said that the electron gun DSO test took place on Friday.



CLEAR

There was no report.

Linac4

G. Guidoboni reported the status of the Linac4 ([Annex 7](#)).

The Linac4 was restarted last week, on Monday, and the second phase of the reliability run started yesterday. It will last until the 30/04/2017 (with a stop in January-February) under the supervision of BE-OP with support from BE-ABP.

M. Gourber-Pace asked whether the Linac4 control room was still in use. **JB. Lallement** answered that this control room has to be kept operational for occasional debugging.

TI

C. Wetton said there was nothing worth mentioning.

3. Schedule update.

B. Mikulec presented the new version of the [injector schedule](#) (version 1.6).

The LHC MD4 block will start at the end of week 46. An extra 3-day MD block (LHC MD5) was added at the end of the week 49. The new Injector schedule version 1.6 was approved.

H. Bartosik commented for the Wednesday Injector MD block that besides the dedicated MD in the SPS there is no special disturbance expected for the physics users of the other injectors.

4. AOB

The maintenance of the door YEA02.PSR=352 from Thursday 02/11 - 8.30 to Friday 03/11 - 17.00 was approved.

Next Meeting: Tuesday 7th November 2017.

Minutes reported by [JB. Lallement](#) on 2nd November.



Summary of the 33rd FOM Meeting

Held on Tuesday 7th November 2017

Agenda <https://indico.cern.ch/event/678374/>

1. *Follow-up of the last FOM*
2. *Status of the machines*
3. *Schedule update*
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 32nd FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

G. Bellodi reported the status of the linacs ([Annex 1](#)).

The Linac2 had an excellent week with no issue to report.

On the Linac3 side, there were a few trips of the RF Thomson generator at the beginning of the week. The source was retuned on Wednesday afternoon to gain in beam stability (though at the cost of a couple of mA decrease in intensity on BCT41, and slightly worse shot to shot variation). Performance was very stable in the second part of the week.

LEIR

S. Jensen reported on the LEIR status ([Annex 2](#)).

The machine availability was 85% over the last week. The list of the various faults that occurred over the week is given. There were few trips of the CRF41 cavity, which required RF expert intervention. A phase shift between LEIR and PS was observed on Wednesday (OK after FECs reboot, but being investigated). Since yesterday, there is an issue with the ER.KFH34 kicker and the machine was presently running in degraded mode. Since this morning, the beam is lost right after injection. This issue might be related to a problem with the e-cooler.



PSB

B. Mikulec presented the status of the PS Booster on behalf of **JF. Comblin** ([Annex 3](#)).

It was a very good week for the Booster with 99.4% availability and few short downtimes due to few needed resets and an intervention of RF specialists for a beam loading problem. For the first time, the new B Train distribution with White Rabbit was tested on an LHC25ns type beam with very promising results.

ISOLDE

L. Fadakis reported the status of ISOLDE ([Annex 4](#)).

It was a very interesting week with 4 different experiments sharing the beam from GPS (target #619). MINIBALL required the lasers to minimize contamination while the remaining 3 experiments needed to run in VADIS mode. 206Hg46+ beam was delivered since Thursday night to MINIBALL (IS547). The REX RF cavities were pushed more than ever to provide beam and they performed greatly (only 5 trips over the week). 199Hg beam was sent to GLM for both Biophysics and Solid State Physics (IS585, IS515, IS602), since Tuesday night.

The Pb target used last week needs approximately 450A to heat up, melt and produce the beam. The temperature inside the target needs to remain quite stable at ~480Deg. Depending on the intensity of the STAGISO beam, the target heating system has to be regulated from 0-500A. This means that every change of the Supercycle composition has to be compensated by an increase or a decrease of the target heating (if the target cools down, the Pb will solidify, which could be problematic for the remaining of the run). The PSB operators were aware that they should inform the ISOLDE team as soon as the Supercycle gets modified.

There were few issues over the last week. On Tuesday the proton scan could not be performed because the two wire grids used to steer the protons onto the target were not working properly (FEC reboot solved the issue). Due to field emissions, the SRF05 cavity had to be operated at a smaller gradient than originally set up. During the setting-up on Thursday, the extraction electrode moved in by itself and got stuck (expert was called).

B. Mikulec asked whether one could think of an automated feedback system for keeping the Pb target at the correct temperature. **L. Fadakis** answered that such a target is only used once a year and the investment in time to build such a system is not really worth it.

ISOLDE Users

K. Johnston could not be present at the meeting and sent the following information.

There were several experiments taking Hg beams last week on GPS: 206Hg for MINIBALL and 199Hg for collections (solid state and biophysics). For MINIBALL it was realized relatively recently that 206Pb would also come from the target (and would be a problem for their measurements). This affected the setup with the planned plasma ionization needing to be complemented by laser ionization. Setting this up required more time than expected with great efforts from the operations, lasers and target teams to allow two separate tunes of HIE-ISOLDE. In the end we settled down to lasers for MINIBALL and plasma for collections. Instead of being able to operate fully in parallel the two groups had to run in series and the run was less efficient than it should have been. Although good new data were collected by MINIBALL



on the excited states of ^{206}Hg and numerous experiments were possible for biophysics/solid state, the reduction in overall time has led to reduced statistics and more time may be required to complete the experimental program.

PS

I. Efthymiopoulos reported the status of the PS ([Annex 5](#)).

It was a very good week for the PS with 97.7% availability. The main downtimes were mainly due to transient faults related to RF cavity and power converters (including POPS). Since Thursday, the AD and nTOF beam are run with the upgraded B-train. Some missing signals from the B-train to execute the programmed cycles are still observed on the other beams (good hope that this will be sorted out once all beams will be transferred to the new system – hopefully this week). Among many MDs, one aimed at accumulating statistics in view of the decision later in the year to dismantle the CT equipment from the ring (a MTE SFTR0 cycle @ $2.4\text{E}13$ was used to continue the studies and accumulate statistics). The yearly scheduled protons on target for nTOF was reached on Thursday.

East Area

B. Rae said there was nothing special to report.

East Area Users

H. Wilkens said users were happy.

nTOF Users

D. Macina said users were VERY happy.

AD - ELENA

T. Eriksson reported the status of the AD ([Annex 6](#)).

The AD had a pretty good week with 96% availability. On Monday, the HLRF on C02 and C10 had an unexpected behaviour. The normal situation recovered although the issue was not understood. On Wednesday, e-cooler power supply and water cooling issues perturbed the operation. On Friday, some adjustments on the extraction kicker timings improved the ejection efficiency.

The ELENA ion source was repaired, but the beam is very unstable. Some basic setting-up was performed last week taking a pbar shift. The e-cooler installation is still scheduled for the two first weeks of December.

AD Users

H. Wilkens said there were some hiccups with the ATRAP helium delivery.



SPS

V. Kain reported the status of the SPS ([Annex 7](#)).

It was the second week of Xe run at the highest momentum (360 ZGeV/c). The problem of the vertically drifting beam in H2 for NA61 was understood and could be mitigated. It was due to the change of field with temperature of one of the vertical bends in H2. As soon as it had been switched into DC no more issues were reported. Due to the ZS sparking with ions in the supercycle during 8b+4e filling, the LHC filling supercycle was changed and does not include any fixed target cycle anymore. The low emittance Roman pot beam was taken on the INDIV cycle in the SPS. 0.5 mm.mrad in V and 0.8 mm.mrad in H were measured for $\sim 1e+11$ p+ per bunch.

The SPS had a very good availability of 95% of availability despite the 6 hour stop due to a LOKN configuration issue on a power converter card in the North Area.

North Area

B. Rae said that it was a very good week. The switch to lower momentum took place yesterday and went very smoothly with beam available to users at 6.00 PM.

North Area Users

H. Wilkens said that the NA61 users were very happy with the fast switch in energy.

AWAKE

There was no report.

LHC

J. Wenninger reported on the LHC status ([Annex 8](#)).

On CMS request, the LHC run was shortened by one week and will end on Monday 4/12. The medium energy run will take place on weeks 46-47 and the MD4 block on the last week (week 48). In order to help LHCb in collecting more data, the LHC is now run with long fills up to 24 hours and 50 fb⁻¹ integrated luminosity since the beginning of the run should be reached by the end of the week. The beam requests for the coming week are the following:

- Standard INDIVs of $\sim 1E11$ ppb for Wednesday (high beta* at injection commissioning) and Friday (2.51 TeV run commissioning).
- Beam for VdM scans on Saturday (could be early morning): Gaussian VdM beam with 3 to 3.5 mm.mrad emittance and 0.7e11 to 0.8e11 ppb, INDIVs and TOTEM beam (1e11 ppb / 0.8 mm.mrad).
- Later on Saturday back to 8b4e of ~ 1.25 ppb for at least 10 days.



CLEAR

There was no report.

Linac4

G. Guidoboni reported the status of the Linac4 ([Annex 9](#)).

It was a pretty good week with 90% availability with downtimes mainly due to trips of the RF and of the pre-chopper. Work in progress on RF software upgrades, instrumentation debugging and full ppm operation. An access will be given to the tunnel on Friday.

TI

J. Nielsen said there was nothing worth mentioning.

3. Schedule update.

B. Mikulec presented the new version of the [injector schedule](#) (version 1.7).

The LHC run will stop on Monday 04/12 at 6.00 AM.

On **H. Wilkens** request and in agreement with the participants (to ease installation work in H8) the injectors MD on Wednesday 6/12 was moved to Monday 4/12.

S. Montesano said that UA9 people were not available on the 15/11 and asked whether the UA9 run could be moved one week later. **J. Wenninger** said that the LHC will be in high beta run during that week, and there might be many fills affecting the protons availability for UA9. Discussion on UA9 rescheduling will take place offline and the decision reported to one of the coming FOMs.

The Injector schedule version 1.7 was approved with the modification brought forward by **H. Wilkens**.

4. AOB

The maintenance of the door YEA01.LN2=363 from Thursday 09/11 - 8.30 to Friday 10/11 - 17.00 was approved.

The intervention on the access point EA2-IRRAD – YEA01.EA2=157 on Wednesday 08/11 from 9.00 to 10.00 AM was approved. It will require a patrol of the first sector and an RP survey. Beam will be stopped at 6.00 AM.

H. Bartosik said that tomorrow's MD is dedicated in the SPS and will affect the NA. He also added that between 1.00 PM and 6.00 PM no beam will be sent to East Area users.



Next Meeting: Tuesday 14th November 2017.

Minutes reported by [JB. Lallement](#) on 9th November.



Summary of the 34th FOM Meeting

Held on Tuesday 14th November 2017

Agenda <https://indico.cern.ch/event/680209/>

1. *Follow-up of the last FOM*
2. *Status of the machines.*
3. *LHC MD4/5 beam requests*
4. *Schedule update*
5. *AOB*

1. Follow-up of the last FOM

B. Mikulec chaired the meeting.

The list of presence can be found in [Annex 0](#).

The [minutes of the 33rd FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

R. Scrivens reported the status of the Linacs on behalf of J.B. Lallement ([Annex 1](#)).

Linac2 had an excellent week with 100% availability. The source HV column was cleaned during the PSB stop on Friday.

There has been a radiation alarm reported at midnight and the corresponding monitor has to be checked.

The Linac3 week was also pretty good with only two source RF generator trips (10 min downtime on Monday and Sunday) and a tank2 trip that was restarted by the RF team (20 min downtime on Wednesday).

Linac3 to run until 18 December mid-day (for foil tests).

The LEIR machine co-ordinator was informed that the crane was again parked on the LEIR platform; EN/HE should check that their teams are aware not to park it in this position.

LEIR

M.E. Angoletta reported on the LEIR status ([Annex 2](#)).

Not one of the best weeks for LEIR operation.

The main topic of the week was the kickers operation. LEIR operated from Monday 6th November to Thursday 9th November with two kickers (ER.KFH31 and ER.KFH32) instead of the usual three



because ER.KFH34 went into fault and a switch needed to be changed. The idea was to wait until a PS or SPS access of a couple of hours to change the switch. During this time ER.KFH31 tripped very often, owing to the extra voltage required to compensate for the missing kicker. A short downtime (about 5 minutes) happened every time it tripped. Finally on Thursday 9 afternoon ER.KFH31 tripped one time too many and it was decided to make the access so as to change the switch on ER.KFH34. This was successfully done with a 4 h intervention; normal operation with 3 kickers was recovered. An intervention on LEIR SEMGRIDS could also be done in the shadow of this access.

On Tue 7 morning the beam was suddenly injected but immediately lost. That could be traced back to the electron current in the electron cooling system that was about 1/2 of what it was expected to be. The expert came to investigate and found a faulty power supply in the control unit, which was promptly changed. Beam was lost for a bit over 3 hours due to this problem. This underlined the need for a better diagnostic of the e-cooler system, as this is an essential system for LEIR's operation. Steps are being taken to achieve this.

On Tue 7 morning EPC removed a crate in the spare cavity (CRF43) to modify it and hopefully solve the problem of the failed remote reset. LEIR therefore remained without its spare cavity for two days.

On Wed (during the SPS MD) there was downtime due to a Linac3 fault as well as to the Btrain generation crate (dleibgen) tripping repeatedly.

The power crate for the CRF43 was reinstalled in the late afternoon and initial tests showed that the problem might now be solved. As CRF43 was only the spare cavity, not (yet) used for operation, no down time was due to this.

On Friday the LLRF team changed the pick-up used for the phase loop, to a pick-up not included in the orbit system. This will allow BI to carry out calibrations in parallel with operation (with radial loop disabled). The EARLY user was set up to operate with the new pickup.

Over the weekend there was a short downtime due to a trip of the CRF41 cavity, that was solved with a remote reset. The NOMINAL user was set up to work with the new phase PU, in view of the SPS MD on Wed 15 November.

On the MD side, it is worth mentioning the first tests of the LEIR LLRF with the new Btrain system. On Wed 8 November the communication was successfully validated and data from the new Btrain system could be successfully acquired and displayed in OASIS. The new Btrain was not yet calibrated hence it was not possible to use it on the beam. This will be hopefully achieved in a new MD this coming week.

PSB

S. Albright presented the status of the PS Booster ([Annex 3](#)).

Mostly a good week for the PSB, one major fault in Ring 1, minor faults otherwise. Special beams for the LHC were delivered within specification along with the usual operational beams.

Prior to Fridays intervention there was an ongoing problem with BT1.SMV10. An ongoing drift in the acquired current required monitoring and correcting by operators. There has also been a small drift seen in BT4.SMV10 and intermittent fluctuations in the acquired current of BT2.BVT20. The fluctuations in BT2.BVT20 are less than 1%, but appear to coincide with vertical trajectory fluctuations in the transfer line from ring 1 and ring 2.

Small interventions in the BT1.SMV10 power supply temporarily returned



the performance, requiring stops of ring 1. However, the problem was not resolved. Thursday night shift crew saw a complete failure of BT1.SMV10 followed by a fire alarm and access by the fire brigade. EPC piquet was unable to restart the septum. As the operational beams could be supplied either in degraded mode or as normal it was decided to organise the intervention on Friday morning. On Friday morning ring 2 cavities stopped pulsing for about 2 hours requiring piquet and expert intervention. The decision was taken to start the BT1.SMV10 intervention as soon as possible; beam was stopped at 08:26 and returned at 15:01. The expert found that a strip line had failed; this was replaced and appears to have solved the drift in the acquired current. A full MD schedule as usual saw successful demonstration of the white rabbit B-train, along with the usual diverse studies.

PSB – BT1.SMV10 problems additional presentation

M. Hourican presented the problems of the BT1.SMV10 strip line failure occurred on 09.11.2017 ([Annex 4](#)).

Current stability problems since several weeks were reported. Several attempts on the EPC power converter side to solve the problem until 09.11.2017 when a fire alarm was triggered, but nothing was found. For the investigation, the beam was stopped and the firemen entered at 23:37. SMV restart resulted again in a failure and an open circuit was found. On 10.11.2017 the beam was stopped at 08:25. Access to PSB took place at 09:15 for diagnostic, which only took 30 seconds. A DIMR was created with RP (no. 7974961) and the IMPACT was created with RP (no. 102626). The intervention started at 11:30 and was finished at 13:45. The Converter tests started at 14:15 and it was released to the CCC soon after. The beam was back at 15:01.

During the first inspection, severe arcing, melted material and projection of copper and insulating materials in the immediate area was found. The working conditions were hard to replace the broken strip line. The cause of the failure was fatigue. The strip line carried about 10^6 times a current of about 26 kA. Fatigue of the copper flexible braid is the cause of the failure. Broken individual strands caused a gradual reduction in cross section of the current carrying connection and increased heat dissipation in the reduced area. This led to the severe electrical arcing at both sides of the braid with the inevitable mechanical failure of the central part, which went to open circuit mode. Summary and proposed follow-up:

- When there are fluctuations or drifts in the current stability the magnet connections should be investigated asap.
- Smoke alarms or fire detection indicate to the firemen specific areas to check
- Make closer inspections each shutdown (and during TS), especially in the least accessible areas.
- Efficient planning and the help of RP to compile and approve DIMR's and IMPACTs allowed for a rapid intervention.
- The accumulated collective dose was kept well below the estimate by using experienced specialists; the estimated collective dose was 400 μ Sv and the real dose 266 μ Sv.

Actions to be taken: The molten copper and other debris have been projected on to the bellows assembly. The assembly allows for remote positioning of the septum in both the vertical and angular directions. It has not been ascertained yet if molten debris has been projected between the individual bellows membranes. During YETS the assembly will be inspected more closely to



evaluate the risks. For the moment, all adjustments of the position of the septum should be limited and only moved when absolutely necessary. Another spare of the strip line is also ordered. The presentation was closed with the acknowledgement to the RP team for their fast and efficient response, **G. Dumont** and **J-F. Gruber**. Additionally, to EPC for their efforts to keep the septum running and starting it up again. Finally, to Firstline for the fast lock out and reconnection of the power converters.

B. Mikulec asked if firemen didn't know the exact location of the alarm.

M. Hourican answered that he didn't know. He suggested that the next time the specialists should be contacted to join the firemen to give a better diagnose of the problem.

B. Mikulec asked if it was possible to also inspect the strip line of BT4.SMV10 at this occasion.

M. Hourican answered yes and that all looked okay.

R. Steerenberg asked where the transformers are located now and after LS2 and how long the intervention time would be in case of a transformer failure.

M. Hourican replied that it would be in the order of a week.

B. Mikulec said that this should be discussed within the LIU-PSB meeting.

ISOLDE

M. Lozano Benito reported the status of ISOLDE ([Annex 5](#)).

It has been a very good week at ISOLDE.

Only a trip of a power converter with the need of a manual reset has been reported.

We have been delivering 56Cu to XT03 at different energies from Wednesday night.

Only some downtime (around 6 h) due to the mentioned problems at the BOOSTER and minor interruptions due to some electrostatic element trips at GPS separator and CA0.

In parallel GLM has been taking some samples of 64Cu and 61Cu .

ISOLDE Users

K. Johnston reported a very good week for the users at ISOLDE:

On HIE ISOLDE IS607 was taking 59Cu at a variety of energies to measure the (p, alpha) reaction of this isotope for nuclear astrophysics. In parallel 64Cu was taken for diffusion studies in solar cell materials and high entropy alloys.

It has been a long time since this beam was produced at ISOLDE and there some questions over whether the yield would be sufficient, but in the end the intensity and purity were excellent. The machine has been very stable and excellent data were taken on both sides and the experimental programmes are essentially complete.

PS

K. Hanke reported the status of the PS ([Annex 6](#)).

A very good week for the PS with only a few problems on the PS side.



Most of the down time was caused by trips of the POPS, which occurred regularly throughout the week. The downtime related to these trips is always about 10 min, but there was quite a number of them. There was also a broken PLC, which caused some radiation monitors to trip. Otherwise only a few resets here and there.

On Tuesday A. Beaumont deployed the new B-train measurement and White Rabbit distribution on all users. So far there are no issues with the new system.

In the second half of the week (Thursday/Friday) there were PSB problems with the vertical septum (see PSB report), which caused quite some downtime for the proton operation in the PS, but it was possible to continue with ions and make good progress. During an MD on Wednesday Xe beam could be sent to the East Area dump.

On Friday evening a number of radiation monitors tripped and the PS had to stop operation. The RP piquet had to disconnect several monitors, and to compensate for this he decreased the threshold on some of the others. This allowed us to resume operation. Then the problem could be traced down to a faulty PLC which was changed, which allowed returning to the original thresholds.

East Area

B. Rae said there was nothing special to report.

East Area Users

H. Wilkens said users were happy.

nToF Users

D. Macina said users were VERY happy. Next week there will be a new experimental setup with frequent accesses. The PS will be informed as usual.

AD - ELENA

L. Joergensen reported the status of the AD ([Annex 7](#)).

Only minor problems to report.

Monday, an AD MD took place with tests of the AD injection line for possible replacement in LS2 of quadrupole magnets with permanent magnets.

The ELENA ion source was repaired, but the beam is very unstable. Some basic setting-up was performed last week taking a pbar shift. The e-cooler installation is still scheduled for the two first weeks of December.

DI.DVT6067 trips often, but since it has a nominal current of only 1 A, it only reduces the intensity very slightly.

Tuesday morning there was a failure of the electron cooler. The water level in the collector cooling water tank was low. After an OP7 Excep, the water tank was refilled and the electron cooler was operational again. The electron cooler team request another OP7 Excep later in the week to ascertain the rate of water loss. Thursday morning, in the shadow of low beam intensity from the PS Booster,



the access for the electron cooler was made. The BCCCA team also made an access to fine-tune the cryogenic system of the apparatus.

Over the weekend there were several faults in one of the modules of the 10 MHz system, DR.AC10-26. A reset usually solved the problem, but **A. Jibar** has now installed a monitoring system and asks that we contact him directly in case of future faults.

ELENA makes slow progress with anti-protons.

M.E. Angoletta said the low level RF works, but the beam is still mis-steered and the loop is not closed. There is an issue with low intensity problem, and the beam instrumentation should be checked.

AD Users

H. Wilkens said there were a few ATRAP problems.

SPS

F. Velotti reported the status of the SPS ([Annex 8](#)).

Pretty good week for the SPS with about 90% availability for FT beam. The week started with the new cycle for FT ion physics - the new extraction energy was 179 ZGeV. NA experiments reported very good feedback for this week's beam quality. The main downtime was accumulated due to an extraction kicker problem in LEIR. After repeatedly tripping for the first part of the week, due to the need to use higher voltage on 2 kickers to compensate for the one missing, on Thursday the switch was replaced and operation restarted with no further problems.

During this week, LHC had special runs. This meant for the SPS to deliver mainly INDIVs for the high beta* run. Also, the special supercycle for VdM and BSRT calibration was prepared. This comprised nominal INDIV, VdM special INDIV and low emittance INDIV. Physics at 2.5 TeV was then started during the weekend. Friday ATLAS and CMS achieved (on average) 50 fb^{-1} .

The dedicated MD block was very dense - partially stripped Xe beam, dynamic bump for slow extraction (TED was locked out and TT20 was switched to proton mode for the MD duration) and high intensity LHC beams (Q20 and Q22 optics).

On Thursday, the powering test of TT41 (AWAKE beamline) was successfully carried out. Also, the AWAKE beam was prepared to be used for Thursday evening for the BGI MD. As a side product, the AWAKE cycle is now ready.

North Area

B. Rae said that it was a very good week. Very quick change of energy so the beam was back at five to users.

North Area Users

H. Wilkens said that the users were very happy with the rapid change in energy.

AWAKE



There was no report.

CLEAR

D. Gamba reported on the CLEAR status ([Annex 9](#)).

The interventions were mainly for the optimisation of photo-injector LASER alignment.

The machine configurations were successfully set up for irradiation tests.

There is still slow process in upgrading the controls system (thanks to CO for their patience and support). Presently the beam is set up for irradiation tests for users from ESA and TRAD.

The resuming of the plasma-lens experiment is planned for the second half of the week.

Linac4

G. Guidoboni reported the status of the Linac4 ([Annex 10](#)).

Linac4 was running fine with a few trips from RF and source.

The first ppm operation of Linac4 took place after the modification of some watchdog properties.

The source was fully running non-ppm

The access last Friday ended with a successful cesiation process.

One MD was done for testing wire scanner electronics for ESS and one MD for stripping foil and BTV at the stripping foil test-stand. Also, a first test of the Laser Emittance Meter was accomplished.

There are a few remaining beam instrumentation issues to be followed up.

TI

J. Nielsen said there was nothing worth mentioning apart from the electrical perturbation on Sunday.

LHC

J. Wenninger reported on the LHC status ([Annex 11](#)).

The first part of the week saw the final days of operation with 8b4e BCS at 6.5 TeV. Wednesday was devoted to the setup for the high beta* run at 400 GeV. Beam setup of the 2.51 TeV cycle with a fast ramp began Friday afternoon.

Major fault of the week: A cryo stop of 24 hours following a cooling water tower in point 8

Tuesday midday and a 6 hour stop due to the PSB recombination septum stripline on Friday.

Friday and Saturday was devoted to the setup and validation of the 2.51 TeV cycle and VdM scan, which was completed by Sunday morning. Intensity ramp-up for the 2.51 TeV physics period on Sunday with a 524 and 1200b fills. Sunday evening was perturbed by a voltage drop on the EDF lines.

Plan: Operation at 2.51 TeV with long fills of around 24 hours.



3. LHC MD4/5 beam requests

H. Bartosik presented the LHC MD4/5 beam requests ([Annex 12](#)).

Mostly standard beams are requested, but some cycles that haven't been used for a while should be revived and checked (e.g. LHC50).

H. Wilkens asked if the North Area would be affected a lot and that the dedicated filling should be minimized during the LHC MD week 48.

H. Bartosik said that everything would be tried to minimise the impact on the North Area.

R. Steerenberg pointed out that there is now a special column available in the file (freq inj column) mentioning whether it is expected to have frequent injections or not during each MD.

4. Schedule update.

B. Mikulec presented the new version of the [injector schedule](#) (version 1.7).

S. Montesano has requested a shift of the UA9 run since the present planning was incompatible with the availability of experts.

H. Wilkens agreed on behalf of the North Area physics users that the UA9 run would be moved to the 12th of December after the COLDEX run.

B. Mikulec asked when AWAKE would start, but there was no representative.

R. Steerenberg agreed to change the schedule accordingly.

R. Steerenberg said the 2018 LHC schedule will be presented and approved at the LMC meeting tomorrow; the 2018 Injector schedule will then be circulated among key people and presented at the next FOM prior to approval at the IEFM.

H. Bartosik confirmed that there would be no MD tomorrow.

5. AOB

No AOB's.

Next Meeting: Tuesday 21th November 2017.

Minutes reported by [S. Hirlander](#) on 15th November.



Summary of the 35th FOM Meeting

Held on Tuesday 21st November 2017

Agenda <https://indico.cern.ch/event/681927/>

- 1. Follow-up of the last FOM*
- 2. Status of the machines*
- 3. Schedule update*
- 4. Draft 2018 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 34th FOM](#) were approved.

Concerning a question raised during the previous meeting, **G. Dumont** confirmed that the alarm on the Linac2 repeater noticed on 13/11 was due to a test performed by RP during the Monitoring Station issue in Linac3 on 10/11. This was therefore not a real Linac2 alarm. **R. Scrivens** commented that it would be nice to have the alarm repeater labelled.

2. Status of the machines.

Linac2 & Linac3

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

Linac2 had an excellent week with 100% availability. Some adjustment of the buncher slightly improved the linac transmission.

Linac3 had also a very good week with only 2 source trips (few minutes each). The source RF generator will be changed at the end of the year.

LEIR

R. Alemany reported on the LEIR status ([Annex 2](#)).

It was a good week with 97.7% availability. The only fault that is worth mentioning for the week is related to the cavity ER.CRF41, which started to be unstable on Friday evening. It was decided to



switch to the ER.CRF43 cavity on Saturday morning and the situation is stable since. The problem affecting the CRF41 cavity will be investigated this week.

C. Rossi commented that the decision to switch to the CRF43 cavity could have been taken already on Friday evening if an RF expert had been called earlier.

PSB

GP. Di Giovanni presented the status of the PS Booster on behalf of **A. Findlay** ([Annex 3](#)).

It was a very good week for the PSB with 98.5% availability. On Wednesday an onboard power supply problem cleared the main FPGA of the motherboard and stopped the RF from working for 1.5 hours. The specialists replaced the card that generates and controls the power supplies and the crate was back online. They are keeping an eye on it in case of further problems. BT1.SMV10 was seen to be drifting once more, the experts suspected that the regulation of the supply needed to be adjusted after the change last week, and did the necessary. It has been stable since. On Sunday the BTP.DHZ10 died, depriving the PS of beam, so the EPC piquet was called in to fix it. He replaced a card on the supply and the beams were returned after 1h20. The list of available beams was given.

ISOLDE

S. Mataguez reported the status of ISOLDE ([Annex 4](#)).

It was a very good week at ISOLDE. $59\text{Cu}20+$ beam was delivered at 5.0 MeV/u to the Edinburgh chamber until Wednesday morning. From Wednesday stable $22\text{Ne}7+$ beam at 5.5 MeV/u was sent to MINIBALL from EBIS as part of the IS628 experiment and BE-ABP had machine development with the REX-TRAP and REX-EBIS using 13CO in parallel. The HRS separator was in preparation from Friday for the next 28Mg run.

ISOLDE Users

K. Johnston said it was a transitional week at ISOLDE. A new setup at MINIBALL (HIE ISOLDE) requires almost a week of stable calibration and this was the main purpose of the week since Wednesday. They have been taking 22Ne at 5.5 MeV/u, calibrating the Time Dependent recoil in vacuum setup (for the measurement of g-factors) which will start this afternoon with 28Mg. In parallel to this some machine development time looking at the injection of 13CO into REXTRAP was possible. It was a smooth week of operation with radioactive beams due to be taken again from today.

PS

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

It was another good week for the PS with 95% availability. The PS is still affected by POPS trips (11 this week) apparently due to a faulty FGC card. Every POPS trip entails a beam stop of about 10 minutes. The FGC card was already replaced, but the back-up card did not work properly. A 20-minute beam stop should be planned in the coming days to proceed with the card exchange. The list of



available beams and details was given. The integrated intensity delivered to nToF reached 109% of the 2017 initial scheduled value.

East Area

B. Rae said there was nothing special to report.

East Area Users

H. Wilkens said users were happy. On Monday, the two last users were installed and will study the tropogenic particle formations in clouds.

nToF Users

D. Macina said they had to stop today to change the experiment. Operation will resume in the evening.

AD - ELENA

B. Lefort reported the status of the AD ([Annex 6](#)).

It was a perfect week for the AD.

AD Users

H. Wilkens said that the ATRAP team is still working on the detector. Beam shifts are then transferred to ASACUSA.

SPS

H. Bartosik reported the status of the SPS ([Annex 7](#)).

It was a very good week for the SPS with 96% availability and main downtimes due to injectors.

On Monday the Xe-ion cycle with an extraction momentum of 45 ZGeV/c was set up. Already in the early afternoon the beam was extracted towards the North Area and the secondary beam line physicists could start with their setting up. The North Area had a very good beam availability throughout the week. Only minor interruptions were caused by the dedicated LHC fillings and some downtime in the injectors, most notably trips of POPS in the PS (Wednesday/Thursday) and RF cavity issues in LEIR (Friday/Saturday).

The LHC fillings went fine from the SPS side, apart from frequent trips of power converters in TI2 caused by communication problems on the WIC (investigations on-going). Since the middle of the week the intensity of the 8b4e BCS beam is lowered on the request of the LHC following several beam dumps due to losses in 16L2. On Saturday morning the LHC had to delay the beam dump due to a problem on one of the main RF transmitters of the SPS which required a piquet intervention.



North Area

B. Rae said it was a very good week with very quick energy switch.

North Area Users

H. Wilkens confirmed the very efficient energy change.

AWAKE

S. Gessner reported that AWAKE electron beams will be started tomorrow. Protons will be sent to AWAKE for 3 days from Friday next week (1-3 Dec.) and again from 9 to 18 Dec. excluding days with COLDEX and UA9.

LHC

E. Bravin reported on the LHC status.

It was a good week with 2.5 TeV until Sunday afternoon although the issue with 16L2 losses reappeared. For this week, the LHC will require standard 8b4e BCS beam with low intensity. MDs will start from Sunday and beam requirement will be discussed with injectors in due time.

CLEAR

A. Curcio reported on the CLEAR status ([Annex 8](#)).

Dielectric capillary for plasma lensing experiment and Schottky diodes on the THz bench were installed. Irradiation tests for ESA and TRAD users, measurements and optimization of transmission through the plasma capillary and background characterization of the THz signal were performed.

Linac4

G. Guidoboni reported the status of the Linac4 ([Annex 9](#)).

The low energy transmission was optimized by adjusting LEBT parameters. Beam instabilities over the pulse were observed and are probably coming from RF (investigations on-going). There were MDs on the source, pre-chopper and Bunch Shape Monitor. From Friday, operation was perturbed by a pre-chopper issue (fixed on Monday) and a fault on the RFQ modulator (being investigated).

TI

R. Ledru said there was nothing worth mentioning.



3. Schedule update.

B. Mikulec presented the [injector schedule](#) (version 1.8).

The LHC MD will start on Sunday. **H. Bartosik** said there will be a dedicated MD in the SPS (no beam for the NA) and he replied a question from **D. Macina** confirming that the LHC MD should not affect nToF.

4. Draft 2018 injector schedule.

R. Steerenberg presented the [draft injector schedule for 2018](#).

The schedule is partly based on LHC activities such as MDs and TS such that any change in the LHC schedule will affect the injectors' one. There is a very busy MD programme in 2018 as many MDs have to be completed before LS2, UA9 crystal collimation and crystal assisted extraction is now to be counted as MD and Crab cavity tests in SPS have to be absorbed in MD time. There are only two injectors technical stops planned in the shadow of LHC TSs.

Q1: Controls maintenance was shortened to 4 days, Linac4 closing and CLEAR start dates to be added. 1st LHC beams (Probe/Indiv) to be ready for TI2/TI8 tests on 22.03.

A. Curcio said that CLEAR will start on the 12/02.

Given the constraints brought by the lock-out and decabling project, **J. Ferreira, S. Deleval** and **C. Rossi** said it was excluded to close the PSB and the PS on the 15/02 (most probably on the 21st). **R. Steerenberg** will meet with the re-commissioning coordinators to refine the restart schedule.

Q2: LHC will once again restart around Easter. Beside usual Wed. MD blocks, there will be parallel MDs in the SPS on Tuesdays and that will affect the NA duty cycle. 2 HiRadMat runs are scheduled on weeks 19 and 22. The first injector technical stop is scheduled on week 25 (30 hours starting on Tuesday).

Q3: Second technical stop scheduled on week 38 (30 hours starting on Tuesday). 2 HiRadMat runs are scheduled on weeks 27 and 31.

Q4: 4 week Pb-Pb LHC run starting from the 04/11. NA ion 4 week run starting one week later. RP survey will be added to the schedule.

H. Vincke said that AWAKE can run until a later date without compromising the LS2 cool-down. It should be checked for the AD.

A new version will be presented and discussed at the next week's FOM. It will be presented at the IEFM on Friday December 1st.

5. AOB.

There was no AOB.



Next Meeting: Tuesday 28th November 2017.

Minutes reported by [JB. Lallement](#) on 23rd November.



Summary of the 36th FOM Meeting

Held on Tuesday 28th November 2017

Agenda <https://indico.cern.ch/event/683788/>

1.1.	Follow-up of the last FOM
2.2.	Status of the machines.
3.3.	Schedule update.
4.4.	Draft 2018 Injector Schedule
5.5.	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 35th FOM](#) were approved.

2. Status of the machines.

LHC

M. Zerlauth reported on the LHC status.
It is the last week of operation. The high intensity MDs are about to finish and a bit of radiation cool-down started. **J. Uythoven** has prepared all the beam requests for the injectors. All high intensity beams will be finished on Wednesday and after that, the maximum number of bunches will be 144. No specific new beam type requests were demanded. On Monday, there will be one or two days of powering tests.

M. Gourber Pace asked if the powering test would last until Tuesday afternoon.
M. Zerlauth answered that it is still under discussion, since there are also a couple of powering tests for high current as well. He said powering phase two normally means maintained patrols in the LHC, which are planned for Monday night. Maybe it can be done on Monday morning and delay the people entering the tunnel by a few hours, but at least on Tuesday it should be over.

Linac2 & Linac3

F. Di Lorenzo reported ([Annex 1](#)).
Linac2 had a very nice week with 100% availability.
Linac3 was also fine apart from minor problems with an RF generator, which was solved by a reset from the operators.



LEIR

M.E. Angoletta reported on the LEIR status ([Annex 2](#)).

LEIR had a very good week. The RF cavity CRF43 tripped three times and the beam was dumped on Wednesday for security reasons because the number of injections was too high.

An MD was dedicated to study the RF cavity CRF41 and CRF43, without much success (see question below). During another MD, the intensity was increased on the EARLY cycle by 10% by shaping the voltage with the CRF43. Additionally, the setup of $h=3+6$ was accomplished, which will be sent next week to the PS for an injection test. Several MDs on orbit system deployment, setup and calibration took place.

B. Mikulec asked if all issues with the cavity were solved.

M.E. Angoletta answered that there was a combined high and low level RF MD to understand the problems of CRF41, which aroused Saturday night two weeks before, but unfortunately the problem could not be triggered anymore. Additional diagnostic tools were installed. The problem did not reappear in the meantime – the problem is neither solved nor understood.

PSB

G.P. Di Giovanni presented the status of the PS Booster ([Annex 3](#)).

A very good week was reported. Reported issues were the repeated tripping of TFB in R1H, an intensity instability of the EAST-type beams, which was tracked back to inhomogeneous setting of BI3.KSW across beams, and the noise on the R2 phase loop, which has to be understood.

ISOLDE

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

It has been a very good week at ISOLDE with 97% availability.

Only a problem with the power supplies of RF, which is known, caused eight hours of beam downtime.

ISOLDE Users

K. Johnston reported a very good week for the users at ISOLDE.

From the machine side it was a very smooth run with very little downtime. The goal of the week was to measure the g -factor of 28Mg at Miniball using a newly commissioned plunger device to 5% precision. However, the beam from ISOLDE proved to be too strong for the data acquisition system to handle and the intensity had to be reduced by a factor of 4. As a result, although the run was very smooth the users will probably struggle to achieve the necessary statistics for this 5% precision for the final measurement.

PS

H. Damerou reported the status of the PS ([Annex 5](#)).

It was an average week for the PS with a beam availability of 96%. There is still suffering from trips of POPS started around the third of October when the FGC card was changed. Experts are working on this issue, but unfortunately it is not yet understood. 1h20 stop for all proton beams was caused by a power converter issue (BSW43), another beam stop was caused by two accesses for gap



relays of 10MHz cavity C10-86. The fast extracted beam was interrupted by a magnet fault interlock of the magnetic septum SMH16. Also, the problem of the KFA71 is followed by experts. A 50 ns and lower intensity ($\sim 8 \cdot 10^{10}$ ppb) variant of BCS 8b4e for the LHC MD was prepared.

East Area

B. Rae said it was a very good week, nothing special to say.

East Area Users

H. Wilkens said users were happy.

nToF Users

D. Macina said there was nothing to report. Data is being taken and on Monday morning the beam will be stopped for this year.

AD - ELENA

L. Bojtar reported the status of the AD ([Annex 6](#)).

Only minor problems were reported.

T. Eriksson said that this was the last week for ELENA with beam commissioning; next week it will be stopped for the year and the e-cooler will be installed. The ion source has been useful and is more stable; taking a certain amount of p-bars from AD. Friday will be the last p-bar shift.

H. Wilkens asked when first physics will be available for ELENA and **T. Eriksson** answered that this will happen only after LS2.

AD Users

H. Wilkens: nothing special to report.

SPS

V. Kain reported the status of the SPS ([Annex 7](#)).

It was a very good week for the SPS with 95.8% availability without hardware faults.

On Monday, the energy was changed to 71.7 ZGeV/c and the next energy change is foreseen for Wednesday. A dedicated MD Wednesday studied the slow extraction loss reduction through extraction with a dynamic bump. Towards the gamma factory, partially stripped ions were accelerated to several energies and with EARLY as well as NOMINAL beam from LEIR. On Thursday, the e-beam permit was signed for AWAKE. The commissioning is ongoing and electrons were seen at the first screen. Since Sunday afternoon the LHC is in MD. FT cycles are used in parallel with single bunch LHC cycles.

North Area

B. Rae said that it was a very good week for the North Area.

North Area Users

H. Wilkens said that accumulated statistics for the current energy is so good that it was decided to anticipate the change to the next energy, which will be done on Wednesday instead of Thursday. Next week concerning the new AWAKE cycle, because the period is rather short - especially if the LHC MD continuous - it has to be seen if one or two more cycles will be available for statistics.



AWAKE

B. Mikulec said that the E. Gschwendtner sent a report:

The electron and laser beam permit was signed last Thursday, we started with electron beam commissioning then on Friday with electrons measured on the first screens after the electron source. Commissioning of the electron source, its control system, SW, etc... continues during the week.

We plan to have the proton beam permit during this week, so that we start setting up the experiment with protons over the weekend and interrupt the electron commissioning during that time.

CLEAR

A. Curcio reported on the CLEAR status ([Annex 8](#)).

There were no major issues.

Linac4

G. Guidoboni reported the status of the Linac4 ([Annex 9](#)).

Linac4 had not the best week mainly caused by several interventions. One issue was an intervention on the pre-chopper. Another issue was the contamination of oil in a tank by aluminium for the RFQ modulator.

V. Kain asked if Linac4 was still meant to be in a debugging phase or if it is already in a reliability run.

B. Mikulec answered that Linac4 is still not fully operational and e.g. not all final RF software and hardware, is available. This arrives hopefully over Christmas. In addition, there are still some issues with the instrumentation and the chopper.

J. Ferreira asked if Linac4 should continue to be covered by piquets.

B. Mikulec answered that OP has to come up with a realistic availability numbers and therefore piquet coverage during daytime should be guaranteed.

TI

G. Langlois said there was a minor ISOLDE problem cornering the mineralized water of a magnet on Monday, which already has been solved.

3. Schedule update.

B. Mikulec presented the [injector schedule](#) (version 1.8).

Concerning the MD block on Monday, **H. Bartosik** said that on Monday there will be a coasting beam in the SPS and the SEMgrids in the PS to study the injection from Booster to PS. It will be a fully dedicated MD thereby effecting all physics users.

D. Macina asked if for nToF the intensity will be normal till Monday 8⁰⁰. **B. Mikulec** confirmed, but said that that the beam will already stop at 6⁰⁰.



B. Mikulec asked all supervisors of the week to show at the next FOM an overall availability statistics of the whole year at the beginning of the physics run with an analysis of the three most popular faults if possible.

4. Draft 2018 Injector Schedule ([Annex 10](#)).

B. Mikulec presented on behalf of **R. Steerenberg** the Draft 2018 Injector Schedule.

V. Kain pointed out that there were still open points concerning the SPS DSO tests and that it was difficult to plan them so far in advance.

T. Eriksson said the AD closing date and DSO test clashes with the mineralized water availability and the bake-out planning, so the start has to be shifted. The closure will be delayed by at least one week.

J. Ferreira Somoza said that the PS closure was not possible because septum 16 will not be ready.

B. Mikulec suggested to give restricted access.

V. Kain said that if the patrol is done the machine has to be clean.

F. Dos Santos Pedroso answered that crates and the system for the bake-out have to be removed.

J. Ferreira Somoza added that the test could be done with the material in the machine, and if the bake-out stops on Friday, the septum 16 will be ready on Monday afternoon.

J. Ferreira Somoza meant that after the cabling campaign they cannot confirm that the signals given to the users are all present. This has to be tested.

A. Berjillos Barranco asked if beam beam commissioning to the Switchyard is confirmed and takes three days.

B. Mikulec replied that she was not aware of an answer.

R. Froeschl added that the 30 hours' radiation survey should be indicated.

B. Mikulec mentioned an email from R. Froeschl concerning the AWAKE and AD beam extension request for 2018. The question was if this extension would be compatible with the work on the interface between LINAC2 and the LINAC4. This seemed to be the case.

B. Mikulec asked the same question for potential works in the AD target area. This has to be checked.

J. Coupard added that the booster in January quickly starts with the dismantling of the transfer line. It is important to keep the same baseline, which means at least six weeks for cool-down.

A. Berjillos Barranco mentioned that the dismantling of LINAC2 is planned for the 3rd of December.

B. Mikulec said that all open points should be clarified before Friday and transferred to **R. Steerenberg**.

B. Mikulec mentioned a question to **R. Scrivens** and **D. Kuchler** concerning the minimization of the protons on the LINAC2 dump. For the Zero-user the pulse length can be reduced, but then the source current given for the others might be smaller and would need to be adapted.



5. AOB

No AOB's.

Next Meeting: Tuesday 5th December 2017.

Minutes reported by [S. Hirlaender](#) on 29th November.



Summary of the 37th FOM Meeting

Held on Tuesday 5th December 2017

Agenda <https://indico.cern.ch/event/685535/>

- 1. Follow-up of the last FOM*
- 2. Status of the machines including 2017 fault analysis*
- 3. Using dashboards for AFT reporting*
- 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 36th FOM](#) were approved.

2. Status of the machines and 2017 fault analysis

Linac2 & Linac3

JB. Lallement reported the status of the linacs ([Annex 1](#)).

The Linac2 availability was 97%. A tank1 quadrupole power supply front panel had to be replaced on Monday (20 min downtime). During the night from Friday to Saturday, the power supply of a PLC dealing with the security of the modulator room and the access system failed. The diagnostic of the fault and the replacement of the PLC required the presence of 2 RF specialists (4-hour downtime).

It was a quiet week for the Linac3 with only two source RF generator trips (on Sunday and on Friday). On Friday, the LEIR injection efficiency was improved by adjusting the tank3 field amplitude. The stripping foil was changed yesterday.

D. Kuchler presented the 2017 fault analysis ([Annex 2](#)).

Over 234 days of operation, the Linac2 uptime was 99.1% with a total of 62 faults dominated by RF and power converters. No recurrent blocking fault requiring action was identified. It looks like the replacement, last year, of the leaking vacuum valve on the source was efficient as there had been no source fault this year. The good statistics for this year are also mainly due to the regular maintenance of the machine.

Over 38 operational days, Linac3 had an availability of 99.8%. The source microwave generator trips were identified as recurrent faults and the generator will be replaced next year. Note that during the



setting-up, the Bertronix amplifiers of RFQ and tank1 had substantial downtime. Their replacement is under study.

LEIR

S. Hirlander reported on the LEIR status ([Annex 3](#)).

It was a very good week for LEIR with 99.4% availability and beams for physics delivered as expected. The set-up of h1/h2 and h3/h6 cycles was done on Tuesday and are ready to be tested on the PS. MDs on second order instabilities and transfer function took place.

During the 2017 run, operation was mainly perturbed by faults on extraction kickers and on the ER.CRF41 RF cavity. The overall availability was 95%.

PSB

V. Forte presented the status of the PS Booster ([Annex 4](#)).

The availability of 95% was dominated by the Linac2 long-lasting fault on Friday evening and the week was pretty good for the PSB. There are still some issues with the R1H TFB. Concerning the noise on the R2 phase loop, a 1 hour stop will be needed to investigate the problem. The high intensity beams were stopped yesterday at 6.00 (just ISOLDE having 24 hours extra run for MEDICIS).

The 2017 average availability was 97% (98% if excluding downtimes due to Linac2 and PS accesses). There were mainly faults related to C02 and C16 cavities and TFB and to the extraction system (extr./recombination kickers).

ISOLDE

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

At REX/HIE ISOLDE, the last MINIBALL run on 28Mg at 5.5MeV/u from HRS finished on Wednesday morning at 9.00 after which the target was changed for the existing #618 UC and set-up started immediately to provide the VITO experiment with Na beam. In the meantime the RILIS lasers which were running for the HRS/MINIBALL Mg run were prepared for the TISD run at GPS.

On GPS the target had been changed on Monday for a TISD MD. The setting-up was done very quickly and the GPS run started on Wednesday. The first irradiation of a MEDICIS target started yesterday. The ISOLDE consignment was done yesterday at 10.00.

The yearly fault analysis report was not available yet.

ISOLDE Users

K. Johnston could not attend the meeting. He sent the following information.

It was quite a busy week. On the GPS a prototype target was studied for the production of molecular beams, this was not so successful but in parallel a modified ion source shows great promise for the so-called "VADLIS" mode of producing beams. On HRS Na beams were taken to VITO for biophysics studies.



This was a very successful run with a definite resonance signal seen in an ionic liquid held at vacuum, a major milestone for IS645. In addition, the ISS spectrometer saw its first stable beam with magnet field applied, again a major milestone and a very good way to finish 2017.

PS

K. Hanke reported the status of the PS ([Annex 6](#)).

It was a reasonable week for the PS with 95% availability. There were frequent trips of the POPS and of the KFA71 throughout the week. Both issues are being followed up by the responsible groups. Although the downtime associated to this is not too significant, both are long-standing issues and need to be understood. During the week-end there was a trip of the PE.SMH61 power supply (not resettable); the piquet and expert had to come in. A 10 min stop has to be schedule to fix the POPS issue (a PBL card change needed).

Over 2017, there was no major fault, but a large number of small faults. Mainly related to power converters (POPS trips and PFW converter), RF system and extraction systems. The Linac2 and PSB downtime contributed to a third of the total downtime.

East Area

B. Rae said it was a very good week and a very good year. CHARM started taking ion beams.

East Area Users

H. Wilkens could not attend the meeting. He sent the following information.

The East Area proton-run completed, users were happy. Good beam availability.

nTOF Users

D. Macina could not attend the meeting. She sent the following information.

On the behalf of n_TOF, I would like to thank the whole operation team for the great year. The remarkable performance of the n_TOF beam has not only allowed us to complete the challenging physics program but also to shuffle our planning and cope with experiments being late and others ready to take data at an earlier stage.

AD - ELENA

B. Dupuy reported the status of the AD ([Annex 7](#)).

It was a good week with 99% availability. On Saturday, from 19.00 to 20.00, the Ecooler failed suddenly on interlock. The fault was due to an issue with the demineralized water circuit that had to be refilled. There was also a small degradation of the performances due to an issue with the stochastic cooling (9 out of 48 amplifiers failed).



T. Eriksson reported the status of ELENA. There was quite a lot of progress on ELENA, both with p-bar and H⁻, on the RF system, orbit response measurement, tune measurements... Some p-bars were decelerated down to 100 keV. The machine was locked out yesterday. The Ecooler will be installed tomorrow. The restart is scheduled for February.

B. Mikulec asked whether the AD team could think about using AFT from next year. **T. Eriksson** said it will be discussed with the operation team.

Upon a request from **M. Gourber Pace** the 2017 AD statistics will be given at the next FOM.

AD Users

H. Wilkens could not attend the meeting, but informed us that there was nothing special to report.

SPS

F. Velotti reported the status of the SPS ([Annex 8](#)).

It was a good week for the SPS with about 93% availability for the NA. The main downtime was accumulated due to power converter issues in TT20, injector complex (PS) and main PC. The week was very busy due to the LHC MD, change of energy for SFTION and re-start of AWAKE. Despite the tricky filling schemes requested for the LHC MDs, all beams were delivered as requested with no major issues. The energy of the beam delivered to the NA was efficiently changed to 95.6 GeV on Wednesday morning, as requested by the experiments. Physics started at about 14:00 already, and running smoothly since then. On Friday, the AWAKE zone was patrolled by the SPS operators, RP and laser experts. The deployment of the proton beam permit followed, allowing extraction from 15:00. The extraction setting up and the steering of the line was smooth, allowing the beginning of the commissioning of the proton-laser synchronization.

In 2017, the SPS availability was 91.4% (larger than the usual ~85%) and the integrated intensity delivered to T6 was 10% higher than scheduled. The downtime was dominated by the injectors' availability (64%), converters faults (11%), RF faults (4%) and operation (4%).

B. Mikulec concluded that 2017 was an excellent year for all the LHC injectors.

North Area

B. Rae said it was a very good week with a very quick energy change. The last change of momentum is scheduled for Thursday.

North Area Users

H. Wilkens could not attend the meeting. He sent the following information.

In the North Area the Pb-run (remark: Xe-run...) is progressing well. There was last week a demi-water problem in EHN1 which brought down the NA61 VTX-1 & 2 magnets. By Thursday the problem was still unexplained. Is there any news on the cause?



S. Deval commented that the fault on the water cooling was due to a faulty level sensor in addition to two water leaks that were repaired in the meantime. The level sensor issue was not fixed yet, but the magnet is cooled and can be powered.

AWAKE

S. Gessner reported that they were taking electrons this week and starting with protons from Friday. They will then be interrupted by the COLDEX and UA9 runs.

LHC

There was no report. LHC finished the 2017 run.

CLEAR

A. Curcio reported on the CLEAR status.

It was a very good week. The plasma lens was installed.

Linac4

G. Guidoboni reported the status of the Linac4 ([Annex 9](#)).

It was a pretty good week with 94.3% availability. The chopper now allows for 600 us beam pulses. Systematic stripping foil efficiency measurements are now taken during nights and weekends. There were MDs on the source, on ToF, on Laser emittance meter and BSM.

TI

C. Wetton said there was nothing special to report.

3. Using dashboard for AFT reporting

C. Roderick gave a demonstration on how efficiently to use the AFT dashboard.

<https://aft.cern.ch/dashboard?timePeriodType=dynamic&start=04122017090000&end=11122017090000&before=7-d&timeRef=closest-Mon-09:00&after=0-d&children=false&tab=82>

He explained and showed different possibilities and available options to personalize and create dashboards.

In 2018, one of the biggest add-on will be the cross accelerator search and the link between accelerator faults.



V. Kain commented that the statistics on beam performances are still missing and should be added. Regular discussion between the operation and CO teams could help in integrating better such statistics.

4. Schedule update.

B. Mikulec presented the [injector schedule](#) (version 1.8). She reported that J. Vollaire gave his green light for the MD planning. Losses should be limited as much as possible and the number of cycles to the dumps limited. The MDs will stop at the end of the week. COLDEX and UA9 runs are scheduled on Monday-Tuesday next week.

The 10-minute stop for the intervention on POPS should be scheduled as soon as possible.

H. Bartosik presented the [schedule](#) for the COLDEX and UA9 runs.

24 h COLDEX run

- Stop SPS NA beam on Monday 8:00
- Access for COLDEX Monday 8:30
- Then COLDEX RUN
- Stop COLDEX beam on Tuesday 6:30
- Access for COLDEX Tuesday 7:00

24 h UA9 run with ions

- SPS ready for UA9 run Tuesday 8:00
- SPS UA9 run until Wednesday 8:00

5. AOB.

A. Bland commented on the decision of the IT department to remove all analogue phones during 2018 ([Annex 10](#)). He encouraged groups and people concerned (working in local control rooms or technical buildings equipped with analogue phones) to attend the meeting organized by IT: <https://indico.cern.ch/event/685578/>.

J. Devine presented the cabling work needed for the resupply of the BE-RF Finemet test bench ([Annex 11](#)). The work will take place during the YETS and there will be no work under the false floor. Under the condition of a positive conclusion of the safety inspection visit, the FOM approved the intervention.

D. Kuchler said that, to allow for MDs, the Linac3 stop was postponed to 18.00 on Monday 18/12 (instead of 6.00 in the morning).



Next Meeting: Tuesday 12th December 2017.

Minutes reported by [JB. Lallement](#) on 7th November.



Summary of the 38th FOM Meeting

Held on Tuesday 12th December 2017

Agenda <https://indico.cern.ch/event/687005/>

1.1.*Follow-up of the last FOM*
2.2.*Status of the machines.*
3.3.*Schedule update.*
4.5.*AOB*

1. Follow-up of the last FOM

K. Cornelis chaired the meeting in behalf of **B. Mikulec**.

The list of presence can be found in [Annex 0](#).
The [minutes of the 37th FOM](#) were approved.

2. Status of the machines.

Linac2 & Linac3

R. Scrivens reported on the Linac2 and Linac3 status ([Annex 1](#)).

Linac2 and Linac3 had a good week with 100% availability.
Some stripper foil tests were performed in Linac3 and Linac3 continues on Monday the 18th December.

LEIR

D. Nicosai reported on the LEIR status ([Annex 2](#)).

It was generally a good week (98.2% availability) with minor problems except for two events. On Tuesday, the KFH32 tripped several times due to a short circuit failure. The piquet took some measurements without any insights. On Saturday, the e-cooler showed some problems. The ER.ECTSOL tripped several times, and after a reset by the PIPO the problem returned. On Sunday, the PIPO and the major events piquet solved the problem by replacing the DCCT chassis. This caused a downtime of about 3 hours.

PSB

S. Albright presented the status of the PS Booster ([Annex 3](#)).

It was a quiet week. On Monday night, due to several trips of R2 TFB, the LL-RF piquet had to be called. He performed a power-cycle on the crate and some adjustments. From Tuesday until



Wednesday the MEDICIS run took place. On Tuesday, the Finemet reliability run ended without faults since 21st June. A 1h beam stop on Wednesday was caused by an exchange of the tuning loop amplifier, which solved the noise on the R2 phase loop. In parallel, the low-field NMR problem was repaired for the operational B-train. On Sunday BR2.C04 tripped. The HL-RF piquet had to replace the power amplifier (non-blocking fault). The beam for COLDEX was checked and optimized.

PS

A. Guerrero reported the status of the PS ([Annex 5](#)).

It was a good week with faults mostly caused by injectors. The beam permit for sending ions to CHARM was signed on Tuesday morning. Two stops were programmed, one on Tuesday afternoon to replace one camera in the F61 line (1h15min beam down) and one on Wednesday to replace a PBL card for POPS and to restart the timing (20 min down). All cameras in the line up to T8 broke one after the other in a short time either due to their end of life or due to the ions. Only one camera was replaced after the split to be able to finish the set-up. Since Wednesday CHARM takes Xenon blown-up beam with an extracted intensity in PS of 1.5×10^{10} charges. The Xenon beam for physics was equally sent all week to SPS with also 1.5×10^{10} charges extracted. Since the exchange of the card in POPS no other trips have occurred. During the weekend the beam was prepared for COLDEX. On Monday, there was a downtime of 1.5h where a power amplifier of cavity C46 was replaced, but the issue is not yet solved. Another access is required.

East Area

B. Rae said it was a very good week, and there is no beam since Monday.

East Area Users

H. Wilkens said there are no more users except for CHARM.

AD - ELENA

L. Bojtar reported the status of the AD ([Annex 6](#)).

Only minor problems occurred. There is still a problem with a leak of the special cooling water circuit for the electron cooler collector, but with 'preventative' filling, it is possible to manage to avoid most problems. There were problems with stochastic cooling due to nine power amplifiers that are out of business. Because of this the experiments had to accept an intensity of $\sim 2.7 \times 10^7$ extracted instead of the normal 3.0×10^7 . The septum and the cavity were reset and the e-cooler power supply overheated. The total uptime was 97.5%.

R. Froeschl asked where the water out of the leak was dropping.

L. Bojtar answered that the leak is a water reservoir like a toilet tank on the ceiling, but the leak is very small so one cannot see a problem around it. The air conditioning dries the air so you cannot find water on the floor.

T. Eriksson asked what the problem with the septum was.

L. Bojtar said the problem occurred at the extraction septum and was solved by a reset. He did not know more about it.



AD Users

H. Wilkens: Everything was fine for AD users. An issue is the helium delivery because there is a big construction site at restaurant 2 blocking the way. This blocking should be over on Wednesday, which is too long concerning the currently available helium.

K. Cornelis asked if there is another way to get the helium maybe in smaller packets.

L. Bojtar that there is no solution at the moment, but the problem will be tackled right after the meeting.

T. Eriksson presented the AD yearly statistics ([Annex 7](#)).

He showed the yearly intensity variation starting at the end of April. In May, there was the maximum intensity, but then there were problems with the tuning of the injection line. Several other issues also reduced the performance. 3.41×10^{12} anti protons were accumulated in total over 15737 cycles. 5200 hours of physics were mastered. The availability was around 95,2%. The faults are "50/50" divided between the machine and the injectors. The power supply category was the biggest contribution to the faults. There was nothing particular compared to the previous years.

T. Eriksson reported that ELENA is closed and locked out. The electron cooler has been installed. Only some alignment issues have to be sorted out.

SPS

K. Cornelis reported the status of the SPS ([Annex 8](#)).

It was a very good week for the SPS with 95.7% availability. The ions run very well, and on Thursday there was the switch to the last and lowest energy in the list (31 ZGeV/c). It runs as good as it can, because at these low energies the signal to noise ratio on the power supplies is already critical. Concerning the ions for AWAKE, there were problems on the weekend with protons. There was an issue with the veto on the laser shutter preventing simultaneous proton beam and laser operation. According to the specialist, the issue appears to be a result of the modifications made to enable the electron gun commissioning. The investigations are still going on and AWAKE got no beam. COLDEX was taking the beam from 20:30 with a rather poor quality, because there was a problem with a cavity, with the need of a spare, which showed a problem with the phase lock. This morning there was an issue with turning on the mains (after the access) and the start of UA9 is delayed. From Wednesday, normal operation is expected and hopefully, the AWAKE problem will be sorted out by then.

North Area

B. Rae thanked for the fast energy change. He mentioned that the beam was back on Thursday.

North Area Users

H. Wilkens said NA61 gets Xenon ions at the end of the spill. The power converters are unfortunately not stable.

K. Cornelis said that this is due to the low energy and this operation is at the limits of the power converters. There is nothing what can be done about it.



AWAKE

E. Gschwendtner reported that over the weekend there was the commissioning of the electron line. Switching on the proton beam was not possible because there was a problem with the access system. Today there was a change of the software and also a DSO test is included. It is planned to have proton beam on Wednesday until Monday. In addition, the plasma cell was heated up today and work was done on the plasma and on the laser as usual.

CLEAR

A. Curcio reported on CLEAR.

There was the installation of the new plasma lens design. Measurements of the plasma lens were taken and no major issues have to be reported.

Linac4

S. Schuh reported the status of the Linac4 ([Annex 9](#)).

A very good availability was reported with 95.4% with periods of long stable running and a few faults of the Source/RF and chopper, as well as extensive MD time. An issue in the chopper maximum chopper on time was found and solved, avoiding a fault from excessive driving term on one of the plates. Higher source current fluctuations were observed since Sunday midday triggering the WD perpetually, which is now under investigation. Systematic stripping foil efficiency measurements were performed. A source cesiation with the autopilot was performed successfully without manual intervention, but a source tuning afterwards was necessary. This is needed due to a change of a piezo valve to a solenoid valve. It was unavoidable, because the piezo valve is not produced anymore. Since the autopilot, looking for the optimal working point, was developed with the old valve, it did not work properly. There is no experience with the new solenoid valve (timing-instead of voltage-based). The autopilot can be set up without beam.

Extensive MDs were done for the source, Time of Flight measurement, Laser Emittance Meter and Bunch Shape Monitor.

TI

J. Nilson was not available and sent a report:

Thu 07/12/17 20:29

Many missed calls have been noted lately, and traced back to a poor network coverage of the CCC. TI missed quite a few important calls, that should have been forwarded to the GSM and although the TI operator was in the CCC the calls didn't come through.

Sat 09/12/17 01:51

Electrical perturbation, caused all injectors to trip. Confirmed by RTE as a perturbation on the 220kV network.

Sat 09/12/17 11:09

Water leak in BAF3, detected by an alarm of too frequent filling on the cooling station. A cooling flexible was detached from its support. TI and CV piquet isolated the circuit for the Weekend in agreement with SPS operators. See event



3. Schedule update.

K. Cornelis presented the [injector schedule](#) (version 1.8).

It is the last week. Today there is the UA9 run. Afterwards Xenon beam will be continued for ion physics in the SPS and protons for AWAKE and AD. On Monday morning, the beam stops for almost all facilities at 06:00. Only low energy beams could continue till 08:00.

4. AOB

A. Bland mentioned an AOB concerning the password change for the operator accounts. The change will be done on the 10th of January as usual.

Next Meeting: 20.02.2018.

Minutes reported by [S. Hirlander](#) on 13th December.