

# Facilities Operation Meeting #42 – Minutes

15/11/2022, via Zoom

**Chair:** Alberto Rodriguez

## List of participants:

Aguiar Y., Akroh A., Albert M., Albright S., Alemany Fernandez R., Antoine A., Asvesta F., Barbet V., Bellodi G., Bidault N., Bozzolan M., Chapuis D., Comblin J.F., Cotte D. G., Damerau H., De Voght J., Demarest P., Di Giovanni G. P., Fadakis E., Findlay A., Fraser M. A., Freyermuth P., Gourber-Pace M., Haase M., Holzer B., Huschauer A., Jaekel M., Johnston K., Karpov I., Kuchler D., Lang T., Lasheen A., Louis P., Lozano Benito M. L., Mahner E., Mikulec B., Newborough A., Nielsen J., Papotti G., Patronis N., Petrika G., Piselli E., Pittet S., Pozzi F., Rae B., Ramberger S., Rodriguez J. A., Roncarolo F., Rossi C., Rumolo G., Salvant B., Sanchez Alvarez J. L., Sargsyan E., Siesling E., Simon P., Skowronski P. K., Spierer A., Steerenberg R., Timeo L., Woolley B., Zevi Della Porta G.

**Indico:** <https://indico.cern.ch/event/1200186/>

## Agenda

1. Approval of the minutes of the previous meeting & Action follow-up (*A. Rodriguez*)
2. Reports from Accelerators & Facilities (*Coordinators*)
3. MD requests and dedicated MDs (*A. Huschauer, B. Salvant*)
4. Short-term injectors schedule outlook (*A. Rodriguez*)
5. AOB:
  - a. Introduction of the new EN-EL group leader (*J. De Voght*)
  - b. Super cycle configurations for the last two weeks of the run (*A. Huschauer*)

## 1. Approval of minutes of the previous meeting and action follow-up

### Update:

- The winter physics request from ISOLDE, beyond the 28<sup>th</sup> of November, was accepted by management.

### Minutes from last week:

- Approved without further comment.

## 2. Reports from Accelerators & Facilities

- a) **TI** (*J. Nielsen*):
  - **Tue**, Level 3 alarm ‘Hydrogen leak’ (false alarm) and evacuation of EHN1. The false alarm was caused by manipulations done by users of the experiment.
  - **Wed**, Evacuation alarms in SPS 4, 5, 6 and ECA5 ([AFT 762476](#)). Local reset of the alarm by the Fire Brigade, but the ventilation in the BA5 beam dump could not be restarted due to a flow meter issue (later fixed).
  - **Sun**, Fire alarm SFDEI-56504 in SPS PA6. Evacuation BA5, BA6 and BA1 triggered. The ventilation had a mechanical problem that caused the smoke, and it was later repaired.

b) **LINAC4** (*J.-L. Sanchez*):

- **AFT:** 99.5 %
- **Downtime:** Power converter of the L4L.RCH.111 steerer magnet tripped eight times. RFQ tripped three times (sparks in the HV tank of the klystron, which requires changing the oil). One bad pulse of CCDTL3.
- **Intervention:** The proton beam from Linac4 will be stopped this Tue. from 14h to 18h to allow an RP survey, in parallel with: oil exchange in the HV tank of the RFQ klystron and exchange of the control rack and of the cable (subd15) of the power converter L4L.RCH.111.
- **Coordinator:** E. Gousiou

#### Questions and comments:

*A. Rodriguez:* An email was sent on Mon. with the plan for the intervention in LINAC4, are there any questions or objections? *G. P. Di Giovanni:* We (PSB) are planning to stop between 14h and 18h. But if the SPS stops at 14h, we will probably stop the PSB at 13h30. Maybe we can better synchronize: either we stop the beam at 14h, and they can enter the SPS half an hour later, or we will need to see if our experts are able to start at 13h30. *R. Wegner:* During the meeting this morning, Julien from EPC said he is available to start at 13h30, and other people as well. *A. Rodriguez:* Does anybody object to starting at 13h30? (- No objection) Will the intervention finish at 17h30, then? *R. Wegner:* Yes, it was the idea to finish at 17h30.

c) **PSB** (*J. F. Comblin*):

- **AFT:** 99.4 %
- **Downtime:** Kicker PSBTK.361.TK.SC.MODULE.1 of the extraction systems tripped twice. A few power converter resets.
- **Activities:** On Tue., fulfilled an unusual, staggered beam request for ISOLDE. Prepared a TOF beam at 1.4 GeV and sent it to the PS. All operational and MD beams were delivered to the users as planned.
- **Intervention:** Access to the machine for a visual inspection during the LINAC4 intervention today.
- **Coordinator:** A. Findlay

#### Questions and comments:

*A. Rodriguez:* Concerning the request from ISOLDE, it also came as a surprise for us, it was a request to irradiate a MEDICIS target, and we were not aware this beam from the PSB would be required. We have passed the information to the MEDICIS colleagues in order not to fall into this situation of short notice.

d) **ISOLDE** (*E. Fadakis*):

- **Activities on REX/HIE:** Beam of  $^{131}\text{Sb}^{31+}$  delivered to Miniball (IS697) with slow extraction, one day ahead of schedule. The experiment suffered from technical difficulties with the data acquisition systems.
- **Issues during REX/HIE runs:** Repetitive trips of two SRF cavities (see Slide 4). Acknowledgements to D. Valuch (SY-EPC-HPM) for his prompt help. Rephasing of a part of the superconducting LINAC is necessary this week.
- **Activities on GPS:** On Tue., finished the preparation of a low energy setup with 39K, then yield measurements and proton scan. On Wed.,  $^{131}\text{Sb}$  delivery to REX/HIE-ISOLDE until Sat. Then, collections on GLM (IS673) and yield checks.
- **Activities on HRS:** On Tue, the experiment (IS702) finished. On Thu., yield checks and ISOLTRAP took beam Sun. Target change on Mon.

- **Issues on HRS:** Faulty communication cable with the separator magnets, replaced and solved by EPC. Issue with the HRS front end, losing vacuum and power for the heating of both target and line due to a problem with a switch indicating the good positioning of the target on the front end.

e) **ISOLDE Users** (*K. Johnston*):

The experiment at ISOLDE last week was the second experiment this year involving the Miniball spectrometer, where the aim was to study the Coulomb excitation of 131-Sb and 133-Sb, which are either side of doubly-magic 132Sn. This experiment proved to be difficult, with the majority of problems on the experimental side; the machine itself performed well. In the end, problems with activity build-up due to a poorly-placed collimator and issues with the data acquisition system meant that the goals of the experiment were not possible, and only one isotope was taken: 131-Sb. The experiment finished early as a result of these problems.

For this week, we may request a stacked sequence of proton pulses NORMGPS first and then NORMHRS from Friday afternoon. It is not confirmed - it will depend on the impurities in the GPS beam and the isotope taken on HRS - but if it could be considered in the planning it would be appreciated.

**Questions and comments:**

*G.P. Di Giovanni:* Concerning the proton beam request, it has been done in the past, and it is doable. We will see depending on the activities of the other machines but will do our best to fulfil your request.

f) **PS** (*D. Cotte*):

- **AFT:** 98.4 %
- **Downtime:** Several trips of the extraction kicker KFA 71 caused radiation alarms, concerned mainly modules 11 and 12, and Module 12 was found not synchronized with others (solved by ABT experts). Several problems with the 10 MHz cavities: on Mon., reset of C86, 91, and 96 cavities which tripped altogether; on Wed., all 10 MHz cavities were tripping; on Fri., radiation alarm due to C91 trip. Water flow issue on F16.BHZ167, fixed on Sun. by the SY-EPC Piquet. Wrong roll-back to a previous version of SIS on Fri.
- **Activities:** AD high-intensity beam delivered all along the week, accommodating the request to keep the same cycle before theirs. SFTPRO beam delivery for the last week, with reduced intensities and barrier bucket. Removed the demi-septum TPS15 and observed fewer losses in sections 14, 15 and 16 with MTE beam. Provided different beam intensities for NTOF during the week and solved an issue with cfv-375-btv1 which prevented receiving any information about the beam size and position on the target. Understood a setting issue in LSA for triplets during the MD6883, which was causing oscillations at transition.
- **Highlights:** Display of the gas ionization beam monitors, BGI82H, for the horizontal profiles of the ion cycles (see pictures from the Vistar in Slide 5).
- **Activities:** M. Fraser

**Questions and comments:**

- *A. Rodriguez:* Were all of the 10 MHz tripping together? *D. Cotte:* Depending on the tuning group for the cavities, they would trip altogether or sometimes only a batch of them. The cavity C91 also tripped, and this one is important for MTE beam since it is the only cavity pulsing at the end of the cycle, so if not working, it would most likely trigger a radiation alarm.
- *A. Rodriguez:* Concerning the water flow issue on F16.BHZ167, is it due to the flow in itself or the flow meter? *D. Cotte:* The meter was adjusted for a higher range of flow. It was certainly at the limit, and the Piquet increased the threshold of the meter. *S. Pittet:* We are

very close to the threshold in this sector, and we will have a look during the YETS (filter cleaning, etc.) to see if there is another problem behind it.

g) **East Area** (*B. Rae*):

- **AFT:** 99.3 %
- Nothing specific to report.

h) **EAST Area Users** (*B. Holzer*):

- Ions in T8 for the last five days of the run (already in the schedule).

i) **n\_TOF** (*N. Patronis*):

- Running the last auxiliary measurements for the long 239-Pu campaign in Area1. Switching to a new setup tomorrow for measurements of neutron-induced reactions. Running imaging tests in Area2 until tomorrow.
- Standard intervention on Wed., from 9h until 14h. At the same time, a collimator will be changed in Area2 for a big aperture one.

#### Questions and comments:

- *A. Rodriguez*: Is the collimator that you are changing for neutrons? *N. Patronis*: Yes. This collimator is in the vertical line in Area2. We have to use a fork. We hope to be ready at 14h, but it sometimes takes more time. e will give the information about possible delays as soon as possible.

j) **AD - ELENA** (*P. Freyermuth*):

- **Downtime:** A trip of one of cavity C10.
- **Activities at AD:** Set PS proton intensity to  $1.77e13$ , close to the maximum radiation threshold in Aegis.
- **Issues at ELENA:** A small mistake in the FESA class configuration of the ELENA extraction line grids prevented OP from acquiring the profiles during the weekend (fixed on Mon. by a BI expert).
- **Activities at ELENA:** H- source was repaired again after an electronic card was damaged by an arc.

#### Questions and comments:

- *A. Rodriguez*: Concerning the issue with the grids, did it impact the beam delivery? *P. Freyermuth*: It impacted the setup of the ASACUSA experiment. They would like to see the profiles and adjust the trajectories now. It delayed a little the start of the experiment.

k) **SPS** (*A. Spierer*):

- **AFT:** 89.4 %
- **Downtime:** After the LLRF upgrade, the rephasing settings for LHC/AWAKE and BQM had to be recalibrated. Several cooling water faults on Sat. for the 200 MHz Cavity 5, and a mechanic was needed to fix a switch. Fire alarm for a false alert in BA4, 5 and 6.
- **Activities:** North Area protons, with  $2.53e13$  p/spill on T2, T4, T6 and T10. For the MDs: Parallel PS to SPS transfer studies (Thu.) and PS to SPS automatic steering (Fri.); Crystal shadowing test cancelled; Fast spill monitor in TT20 test completed. LHC MD Block 2 (Mon.-Tue.), with high-intensity BCMS and 8b4e beams. LHC fills with Van der Meer and BCMS beams. Start of the AWAKE run 5 on Sat. morning with steering scans. Ion-dedicated commissioning for all the necessary beams and aperture scans in H and V (see Slide 4).

- **Interventions:** RF power intervention on 200 MHz Cavity 3, and amplifiers rebalanced by experts after several trips on Cavity 2 during ion commissioning. MKDV1, MKE4, MKP4 piquet interventions during high-intensity LHC MDs. On Sat., piquet intervention for damper (ADT V2).
- **Upcoming week:** DSO test, already completed on Mon. morning (no beam from 8h to 12h), parallel intervention on MSE BB4. Setup of slow extraction of NA ions. RP survey on Tue. mid-day. LHC ions on Thu. and Fri. and beam for AWAKE from Wed.
- **Coordinator:** M. Schenk
- **North Area** (*B. Rae*):
- **AFT:** 91.5 %
- No major issue.
- The proton run finished on Mon., and COMPASS acquired their last data.
- The ion commissioning started on Mon.

#### Questions and comments:

- *R. Alemany Fernandez:* You said you got the ion beam at midnight. What are the remaining issues that you have? *B. Rae:* Yes, we got the beam at around 23h30. It seems that the beam is vertically off at the beginning of the line. A vertical scan did not solve the problem, but we can compensate for this displacement with the beam optics. We will work with this compensation, except if the SPS can investigate. The beam is somehow in the experiment now. *F. Roncarolo:* Concerning the instrumentation in T20, we debriefed this morning with SPS-OP, and they managed to steer the beam. I will let the SPS-OP complement if needed, but one of the problems is that the steering was totally off. We need to systematically check the signal-to-noise with this ion intensity and the different gains on the instrumentation. *R. Alemany Fernandez:* For the gains, we were told to stay at ‘medium’ and not to go at the maximum gain. *F. Roncarolo:* That was the case a few weeks months ago. Now it should be fixed. I did not check myself with ions, but it was ok with protons (to go to maximum gain). There was a short with the bias voltage.

#### 1) **North Area Users** (*B. Holzer*):

- The outcome of the Planning meetings for the last two weeks of the run is on the slides.
- To be checked:
  - AWAKE can not / does not want to run in parallel to the parallel MDs on Wed.?
  - AWAKE run during the LHC ion MD days: super-cycle with LHC-ion + SFTION1 + AWAKE or pause AWAKE when LHC-ion?

#### Questions and comments:

- *B. Salvant:* No incompatibility with the MDs. They are supposed to be run in parallel with everything. If AWAKE wants to run, it is not up to us to say no, but I believe it will be tough for OP. *B. Holzer:* If the duty cycle is too low, it might not be worth it for AWAKE to run. *B. Salvant:* From the MDs point-of-view, we have no strong objection if AWAKE wants to run. *K. Li:* It would not be very efficient to run AWAKE because of the long duty cycle with high-intensity beams (which may trigger vacuum interlocks). I would suggest not running anything in addition in parallel. *G. Zevi Della Porta:* In terms of the duty cycle, what is the length expected? We had a meeting for this reason last Fri., and I understood we could not run on Wed. until 18h. What has changed since then? We would be able to take the beam, if available, since the preparation is already done. *B. Holzer:* Nothing has changed. During the meeting, it was more of a ‘most likely’ than a clear ‘no’. Then, *G. Zevi Della Porta, K. Li, B. Salvant* and *B. Holzer* agreed to discuss this question offline.

- *A. Rodriguez*: Is COMPASS satisfied with their data with protons? *B. Holzer*: I do not have the latest feedback. *M. Jaekel*: They reported in the Users meeting that they were satisfied. They did not get the full statistics for the inverse polarisation, but it was not worse than the other periods during the year.

m) **AWAKE** (*G. Zevi Della Porta*):

- **Week 45 report**: Preparation of the laser: manufacturer visit to solve signal-to-noise contrast issue and tune the entire system, then re-alignment of the virtual line to the main beamline and laser marker. Preparation of the electron beam: set up of high-charge beam and propagation to the spectrometer. Warming up of the vapour source and aligning Rb interferometry measurement. Checked the electron/laser and laser/marker timing on streak cameras. For the proton run on Fri.: found the proton beam on all cameras, checked timing, iris-scan, etc. Observed self-modulation as expected with protons in plasma. Finally, a few hours of testing electron acceleration and trying to measure the emittance of the accelerated beam with the new high-resolution cameras.
- **Upcoming week**: Access on Mon.-Wed., then protons. No protons on Wed. before 18h due to MD (may change after offline discussions) and Thu. afternoon due to HI tests.

#### Questions and comments:

- *G. Zevi Della Porta*: Is the statement for the MD of this Wed., also true for the next week's MD? *B. Salvant*: Next week is exactly the same as this week. Again, *G. Zevi Della Porta*, *K. Li*, *B. Salvant* and *B. Holzer* agreed to discuss offline the question of running AWAKE during this period.
- *A. Huschauer* describes the super cycle configurations for the last two weeks of the run (see the AOB section of the Minutes)

n) **HiRadMat** (*P. Simon*):

- Nothing to report.

o) **LINAC3** (*G. Bellodi*):

- **Activities**: Linac3 delivered ~35uA, on average, beam currents to LEIR throughout the week without any interruptions (see Slide 2). Acknowledgement to the source expert for daily tuning the source, even outside of normal working hours, in order to reduce the intensity fluctuations. The stripping foil was exchanged on Tue., and daily energy measurements were taken.

#### Questions and comments:

- *A. Rodriguez*: How large were the intensity fluctuations? *G. Bellodi*: The fluctuations were more shot-to-shot, which can be problematic for LEIR users. *R. Alemany Fernandez*: There are two main impacts for shot-to-shot fluctuations. The first is for single injection beams (for NA), if one beam is with a lower intensity or is missing, this beam is lost. The second impact is for LHC filling. If we lose one shot out of the seven, it might still be fine, but with two shots too low in intensity or missing, then it cannot work. *G. Bellodi*: Our expert is doing his best to keep it under control.

p) **LEIR** (*M. Bozzolan*):

- **Activities**: NOMINAL beam to SPS all week. First turn trajectory test using the BPMs. Machine learning MD for Schottky image recognition.
- **Issues**: Source instability from LINAC3 (often one or more injection lost) means that LEIR cannot produce a good nominal beam. Trips of the ER.DWV42 corrector, followed up by EPC. Issue with the operational Cavity 41, switched to Cavity 43 for the rest of the run.

- **Coordinator:** N. Biancacci

q) **CLEAR** (*A. Malyzhenkov* on behalf of *W. Farabolini*):

- **Last week:** Five experiments: 1) Grid collimator and scintillator on optic fibre; 2) Optical fibre dosimetry; 3) Conical shaped collimator; 4) ChDR BLM; 5) ChDR BPM. A summary of the results is presented in Slide 3. A crash program was deployed after a discussion with BI, to allow their PhD students to achieve the experiments that were foreseen during the two first weeks of Dec., using nights and weekends
- **Issues:** Several klystron trips, not critical and fast restart. Problem with the laser synchronization and amplitude stability. Time-consuming change of the beam characteristics for the various experiments. Problems with cameras and motor limit switches, etc.

r) **LHC** (*S. Redaelli*, by e-mail):

- **Last week:** LHC MD Block 2 was very successful. The full Van der Meer beam program was completed. Resumed to physics on Fri. and Sat., the availability of the machine was excellent until Sun. afternoon.
- **Upcoming week:** Standard operation until Thu., then dedicated ion test for 36 hours starting on Thu. After the ion test, back to physics. No scheduled access until the following week.

### 3. MD requests and dedicated MDs (*B. Salvant*)

[The details of the schedule are available on the slides.](#)

- **Last week:** Short parallel MDs in PSB, PS and SPS.
- **Upcoming week:** Dedicated Linac3 MD during the radiation survey. Short parallel MDs in PSB and PS. Long parallel MD on Wed., to understand vacuum spikes with 8b4e beams and RF studies.
- **Following week:** Short parallel SPS MD on Mon. Long parallel SPS MD on Wed.

### 5. Short-term Injectors Schedule Outlook (*A. Rodriguez*)

[Injector accelerator schedule.](#)

- AWAKE Run 5 started on Sat., and also the start of ion physics at the North and East Areas.
- Intervention this afternoon for the oil exchange of the RFQ klystron at LINAC4.
- LHC ion test is coming this week.

### 6. AOB

#### a. Introduction of the new EN-EL group leader (*J. De Voght*)

*J. De Voght* introduces himself, evokes his previous experiences, and expresses his availability.

#### b. Super cycle configurations for the last two weeks of the run

(*A. Huschauer*)

[Details on three configurations are available on the slides.](#)

- SFTION1 only
- SFTION1 and AWAKE
- SFTION1 and LHC filling

They were also added to the basic super cycle configurations table in EDMS: [2798402 v.1.](#)