FOM Week 28

Summary of the Reports from the Accelerators and Facilities

08 June 9AM → 15 June 9AM

P.K. Skowronski (FOM)
C. Pruneaux (TI)
J.-B. Lallement (LINAC4)
F. Roncarolo (PSB)
L. Fadakis (ISOLDE)
Y. Dutheil (PS)
L. Nevay (EA, NA)
M. Bacak (nTOF)
L. Ponce (AD)
P. Arrutia (SPS)
M. Bergamaschi (AWAKE)
R. Scrivens (LINAC3)
P. Korysko (CLEAR)
D. Nisbet (LHC)

Summary of TI report

Alarms	4723
ODMs	124

- Coordination: Clement Pruneaux → Ronan Ledru
- Issues
  - Mon 10:27: Trip of the NA62 Giga Tracker cooling system due to a false signal sent from the DSS (Detector Safety System)
    - A circuit breaker has been exchanged by EN-EL in BAA85.
    - DSS issue solved the 09/07
  - Tue 16:41: RD5 Cryo Coldbox trip in North Area.
    - At the same time was an intervention of EN-CV on the raw water, but this don't seem to be linked.
    - Investigation by EN-CV ongoing
  - Tue 21:01 and 21:04: Glitch, fault of 400kV line between Grosne and Saint Vulbas
  - Fri: Electrical glitch, fault of 400kV line between Albertville and Montagny Les Lanches 1
  - Fri: High level alarm on the sump in UD68
    - After the LHC dump, EN-CV onsite to manually empty the sump.
    - High level sensor exchanged and pump1 locked off
  - Sun: During a piquet intervention of the Fire detection system, the fire doors in SPS in sextant 2-3 were closed.

Summary of LINAC4

LINAC4	98.8 %	Coordination: Jean-Baptiste Lallement → Giula Bellodi

- Quiet week with 3 faults leading to 3 beam interruptions of about 40 minutes each.
  - Total downtime: 2 hours.
- Issues
  - Tuesday, a **a module of the chopper supply** had to be replaced by the expert [45 min].
  - Tuesday, the dipole magnet LT.BHZ20 tripped because of a water flow interlock. Restarted after the Piquet intervention [40 min].
  - Thursday, another trip of a dipole because of a water flow interlock but in LT.BHZ30.
    - During his intervention, the Piquet increased the water flow and check the 3 dipoles (BHZ20, BHZ30 and BHZ40).
- Intervention request:
  - Follow-up on the L4L.RLF.121 issue last week: EPC would like to replace the power crates of the L4L solenoids at the next available occasion, although not urgently.
  - Estimated duration: 2h.
  - Preferred time: not critical, can wait for a good occasion
    - A list of experts was provided. Nevertheless, in case of issues with one of the Linac4 solenoids, the EPC piquet could replace the crate.

Summary of PSB

PSB	ISOLDE: 96.5 %	PS: 96.5 %	Coord.: Federico Roncarolo → Chiara Bracco

- Activities
  - LHC_BCMS25_LowTail_2024.regularly checked in the PSB and provided for LHC filling
  - Fulfilled as much as possible (w.r.t. to other users/requests in the supercycle) the HRS requests for changing target intensities and have special extraction patterns (e.g. N consecutive extractions separated by N+1 PSB cycles not extracted to HRS)
  - Following last week report on PSB to PS energy matching
    - Applied to all PSB operational users
    - MD users will be re-matched 'on demand' before MD to avoid lengthy work for all existing MD cycles variants
  - Tested triple harmonic at injection for BCMS like beams
  - Fri morning, profiting of SPS stop, access to check BR.QDE11 water leak (19 days after previous access)
    - leak rate ~doubled w.r.t. last measurement, still acceptable for operation
    - Spare magnet should be in bldg. 361 during next days
    - Did not manage to fix second camera (can't move position, BE-CEM following up). Another access needed.

Summary of PSB

PSB	ISOLDE: 96.5 %	PS: 96.5 %	Coord.: Federico Roncarolo → Chiara Bracco

- Issues
  - Fri: **access** (agreed in shadow of SPS downtime) for BR.QDE11 inspection [1h25min]
  - Fri: **BPM FEC not responding**, preventing OP to set > 0 turns [55min]
    - BI expert performed power cycle FEC
    - OP will change the control chain such that this kind of faults do not affect the beam production
  - Sat: **BI3.KSW trip**: ABT piquet changed power supply [2h26min]

- Intervention request
  - Replace camera (for BR.QDE11 water leak remote inspection)
  - Duration of 1h
  - Preferred time: not critical, can wait for a good occasion

Summary of ISOLDE

ISOLDE	GPS n.a.	HRS 97.0 %	HIE 97.5%	Supervision: Leftéris Fadakis → Erwin Siesling

- Activities
  - HRS – REX-HIE ISOLDE Experiment IS686 on ISS with 108Sn (Tin)
    - We would like to thank our PSB colleagues for facilitating our users request to stack proton pulses together and keep them in same numbers-
    - Preparation on the LINAC started on Monday, by Tuesday a reference set up with A/q=3.333 (20Ne6+).
    - Tuesday was the start of the preparation on the low energy side of ISOLDE.
    - Set up of stable beam on 118Sn. RILIS Optimisation
      - To facilitate beam tuning, switching to 87Rb for a more stable beam, was necessary.
      - Energy matching between low energy part of ISOLDE and the normal conducting LINAC (REX)
    - Thursday, delivered stable beam to users set up for beam tuning optimization, into their chamber.
    - Delivered radioactive 108Sn32+ on Friday afternoon.
  - GPS: Repair of HT Faraday Cage door was successful

Summary of ISOLDE

ISOLDE	GPS n.a.	HRS 97.0 %	HIE 97.5%	Supervision: Leftéris Fadakis → Erwin Siesling

- Issues
  - Small Vacuum leak in CA0, a leak test will be scheduled in the following days to identify the exact spot and/or instrument that it is causing this.
  - Fri: HRS Power supply of Separator Magnet 90 went into internal reference and beam was lost.
    - Returned to normal after a power cycle in situ.
  - HRS HT Power supply trip, OK after a reset
  - Sat: users noticed a significant decrease of 108Sn
  - RILIS: First step laser drifted away from nominal position causing a beam loss.
    - On site intervention was required.
  - REX-ISOLDE: Much work required to recover transmission losses on the REX part of the LINAC
  - HIE-ISOLDE: SRF cavities were tripping so the gradient had to be redistributed amongst the last 3 SRF to decrease the power.
- Plans
  - Perform beam energy measurement on 108Sn32+
  - Scale the whole machine to 110Sn32+ and perform another beam energy measument

Summary of PS

PS							
	EAST N	95.4 %	EAST T8	95.4 %	EAST T9	95.4 %	Coordination: Yann Dutheil
	AD	95.8 %	nTOF	95.8 %	SPS	95.8 %	→ Bettina Mikulec

- Activities:
  - Bunch length scanning for AD MD to optimise antiproton yield
  - TOF beam setup remains at 28ns for now, pending the need to accommodate longer bunch length for big EAST parasitic TOF beam
  - BLM monitoring restored for all cycles in PS ring and TT2
  - PSB->PS energy matching for all beams

- Issues:
  - LHC beam splitting issues on Saturday when 2 bunches had higher intensities
    - Solved with manual adjustment after the LHC fill
  - Affected by electrical glitch on Friday evening
  - Power converter water cooling fault in F16 and adjustment on Sunday

Summary of EAST Area

EAST	T8 94.8%	T9 94.8 %	Coordination: Laurence Nevay → Bastien Rae
	T10 94.8%	T11 N.A.	

- Activities
  - T09: Good operation.
  - T10: Good operation.
- No issues
- Plans
  - T09: MPGDCAL continues.
  - T10: IDEA CC continues.
  - T11: No user.

Summary of nTOF

- Coordination: Michael Bacak → Michael Bacak
- Activities
  - Smooth data taking in all experimental areas
  - Mounting of the Ar(n, g) experimental set-up in EAR2 and start with the container gaseous target still empty
- No issues
- Plans: many interventions are in program during the Technical stop
  - EAR1: ending of Er(n, g) and starting of Cu(n, g) measurements
  - EAR2: Ar(n, g), measurements at different gas pressure (200-300 bar)
  - NEAR: activation measurements
- Access request: July 17 from 8h to 16h

Summary of AD

AD	88.0 %	Coordination: Laurette Ponce → Laurette Ponce

- Summary
  - Good week in terms of availability but several periods of degraded performance alternating with good ones

- Activities
  - Reduced intensity over the week-end due to degraded mode of the AD magnetic horn
    - Reduced pulse voltage resulting in ~10 % loss in pbars yield
  - Access in AD for He refill of the BCCCA
  - MD on varying proton bunch length and emittance with a single bunch to observe pbars yield dependence on these parameters

Summary of AD

AD	88.0 %	Coordination: Laurette Ponce → Laurette Ponce

- Issues
  - Communication problem with several Pow1553 power converters in FTA, DI, DE line and e-cooler solenoid:
    - Very tricky diagnostics of a very old system in the absence of the specialist
    - Joint effort of BE-CEM (pow1553 controls) and first line (HW) to find a loose cable on a spare power converters in the loop.
  - 2 possible flash-overs in AD magnetic horn
    - reduced pulse voltage by 2 times 500 V and resume operation in degraded mode over the week-end
  - ELENA transfer line ISEG power converters in communication error AGAIN!
  - ELENA tune meter power cable found unplugged

- Plans
  - Diagnose problem with the horn and try to recover nominal operation

Summary of SPS

SPS	LHC: 83.4%	NA: 77.0%	AW: 95.1%	Coord.: Pablo Arrutia → Carlo Zannini

- Marked by the downtime on Thursday-Friday due to a vacuum leak in 200MHz cavity 3.
  - The intervention to fix the leak was performed very efficiently by all the teams involved.
  - The rest of the week went smoothly, producing beams for LHC, North Area, AWAKE and parallel MDs. There was no dedicated MD this week.
- LHC:
  - Continued filling with low-tails beam.
  - Misbehaviour of bend on TI2 caused injection oscillations (~2.5 mm), which led to mini-quench in LHC due to showers from injection. collimator -> FEI limits being assessed.
  - Filling interrupted due to faulty PS bend.
- NA:
  - No major issues. Few difficulties with spill quality due to super-cycle composition and after beam stops.
- AWAKE:
  - Provided single bunch at an intensity of 3e11.
  - Improved LSS4 orbit flatness at extraction -> reduced losses by 50%

Summary of SPS

SPS	LHC: 83.4%	NA: 77.0%	AW: 95.1%	Coord.: Pablo Arrutia → Carlo Zannini

- Issues
  - Vacuum leak on cavity 3 [~23h]:
    - The SPS cavity 3 (Thales power plant, 200MHz) triggered a vacuum interlock on Thursday ~13h.
    - A leak detection test identified that the leak was coming from a Higher Order Mode (HOM) coupler.
    - The HOM coupler was burnt and was swiftly replaced by a spare.
    - Some other HOM couplers were inspected and found to be OK.
    - The cavity had to be re-pumped and re-conditioned.
    - A final leak test identified no additional issues, fully recovering from the fault on Friday ~12h.
  - Main power converters down [~3h]:
    - Just after the RF had recovered and hopes were up for the beam to be back, the main PCs went into fault.
    - The issue was fixed by replacing Watchdog Interlock Controller (WIC) card in BA3.
  - Mis-driven settings when mapping new cycle [~1.5h]:
    - LSA-to-HW drive did not execute correctly for FEI in TT10.
    - Not easy to find error in SIS -> Assessing best way to display this problem to identify it quicky in the future.
  - Misbehaviour of power converter in TI2 bend:
    - The current was within FEI limits, but injection oscillations (~2.5mm) still caused enough collimator showers to produce mini-quench at LHC -> being followed up.

Summary of SPS

SPS	LHC: 83.4%	NA: 77.0%	AW: 95.1%	Coord.: Pablo Arrutia → Carlo Zannini

- Plans
  - T4 target intensity change on Wednesday
  - Dedicated MD on Wednesday:
    - Access possible in NA only until 2pm (TT20 TED in)
    - After 2pm TED out: beam to P42

Summary of NORTH Area

Target sharing							
T2	30	**T4**	20	**T10**	1	**T6**	30

Availability					
H2	75.2 %	**H6**	75.1 %	**K12**	75.2 %
H4	75.2 %	**H8**	75.2 %	**M2**	75.2 %

- Coordination: Laurence Nevay → Bastien Rae
- Issues
  - H2: Moving beam issue observed again, related to change of beam files in H8.
  - H4: Problem in HP XCET has been identified by the BE-EA and SY-BI teams, tests pending the return of the SPS beam.
  - H6: One brief fault in Bend 1 power supply.
- Plans
  - Change to T4 standard wobbling and 100 mm target head on Wed. 17.07, then also back to the standard 42 units on T4.
    Need 150 units on T6 on the morning of 19.07 for M2 high-intensity RP test.
  - H2: NA61 continues.
  - H4: NP04 continues.
  - H6: MuonE ECAL → DRD6 MAXICC.
  - H8: Atlas TRT → Atlas TRD (change of main user, both stay).
  - M2: AMBER continues. High intensity RP test planned for the morning of Friday, 10.07.
  - K12: NA62 will go back to standard data taking on Wednesday, 17.07

Summary of AWAKE

	M	T	W	Th	F	S	S
SPS extractions to AWAKE	140	234	e-beam	MD	34	1155	396
Hours of beam to AWAKE	1.3	2.2	e-beam	MD	0.4	6.9	2.6

- Coordination: Michele Bergamaschi → Michele Bergamaschi

- Issues
  - Tuesday: Failure of one of plasma source heaters replaced on Thursday access
  - Wednesday: Access system problem preventing to go to beam mode (door YDPC02.TCV4 hardware veto) required intervention from access system technicians
  - Friday: Cavity repair and mains of SPS down
  - Sunday: Power supply of plasma source chillers and new control rack, found a PSU 48V in the rack faulty, replaced with a spare

Summary of LINAC3

- Coordination: Detlef Kuchler
- Activities
  - Monday to Wednesday tests of a software agent for the source. The aim is to develop a tool to support the tuning and stability of the source.
  - Thursday the Sairem2 microwave generator was checked by a representative of the company. The issue was tracked down to the HV supply. This will be shipped now for repair to the company. A spare power supply should be delivered soon (ordered already last year).

- Issues
  - The source performance is still limited due to discharges. By the end of this week we have to see if it could condition away or if we have to open to source to replace the entire extraction system

Summary of CLEAR

- Coordination: Pierre Korysko → To be defined

- Activities
  - Last week was dedicated to medical applications: Irradiations of Zebra Fish Eggs (ZFE) with Very High Energy Electron (VHEE) at Ultra High Dose Rate (UHDR) and Conventional Dose Rate (CDR) for cancer treatment and FLASH effect studies with Hôpitaux Universitaires de Genève (HUG).

- No major issues

- Plans
  - This week is dedicated to the same experiment (ZFE irradiation for FLASH effect Studies) with Hôpitaux Universitaires de Genève (HUG).

Summary of LHC

Availability: **63%** Stable beam ratio: **45%**
Machine coord.: **David Nisbet → Mirko Pojer**

- Started the week with access to exchange the emulsions for FASER and SND.
  This was followed by 24hrs of good luminosity production.
- This was followed by a rocky 48hrs with several fills dumped due to faults.
  This included a large quench following a UFO in S45 causing 12hr downtime.
- Production was also suspended while the SPS repaired and recovered from a vacuum leak in their RF system.
- There were a series of faults on Friday night, including a failed pump for a water sump in the UD68 dump area which caused a L3 alarm to the fire brigade and subsequent intervention to prevent flooding.
- Finally at the weekend we could resume normal operation, with Saturday and Sunday producing good availability and luminosity production.

Summary of LHC

Availability: **63%** Stable beam ratio: **45%**
Machine coord.:
David Nisbet → Mirko Pojer

- Issues
  - PC interlock dumped beams due to loss of communication with FEC cfc-sr2-rl2a
  - Poor quality Q signal caused Qfb to dump at EoR
  - Beam induced quench in S12 following a bad injection from TI2 due to a power converter issue – FEI tolerances to be reviewed.
  - UFO induced quench in S45, and UFO dump in 25R3
  - BCCM triggered correctly when RF tripped due to a power converter fault
  - Faulty RF tuner electronics on line 4B2 dumped beam (access made to repair)
  - Tempestive fault of RB.A56 power converter
  - Flooding in UD68 raised a Level3 alarm to the fire brigade. Significantly degraded material in this area needs maintenance and consolidation.

  - Experiments:
    - ALICE solenoid water leak (now repaired, but power cycling of magnet to be minimised)
    - LHCb VELO lost position due to damaged track (repaired and validated with beam)