30 October 2023

ACCELERATORS & EXPERIMENTAL FACILITIES STATUS

SUMMARY OF WEEK 43 - 2023

Technical infrastructure – *R. Ledru*

Linac 4 - *J-B Lallement*

PS Booster - *F. Asvesta*

ISOLDE – *S. Mataguez*

PS – *M. Fraser*

PS – East Area - *D. Banerjee*

PS – nTOF – *M. Bacak*

AD – ELENA – *L. Bojtar*

SPS - *M. Schenk*

SPS – North Area - *D. Banerjee*

SPS – AWAKE – *G. Zevi Della Porta*

SPS – HiRadMat – *No report, not running*

Linac 3 - *D. Küchler*

LEIR – *C. Carli*

LHC - *R. Bruce*

CLEAR – *A. Aksoy*

Technical Infrastructure (TI)

Facility Coordinator last week	Ronan Ledru
Facility Coordinator this week	Jesper Nielsen

Statistics

Alarms					
Phone calls		***Incoming***		***Outgoing***	
ODMs					

Facility Status

Summary	Very busy week and weekend, with many very complex incidents that all require quite some follow up.
Issues	***Sun 22/10/23 03:42:*** Fire alarms in TCC2, TDC2 and TT83 south. Intervention coordinated with Fire Brigade and RP piquet. Confirmed fire on-site, on a cover of a magnet. A water leak was also present in the area. Cooling circuit was stopped by TI operator in agreement with the Fire Brigade, as well as the ventilation and sump pumps to avoid contamination outside.  See event with pictures and videos. ***Tue 24/10/23 13:03:*** Evacuation building 170,197 and evacuation tunnel cryo module. Brise glas SFBGL-01839 activated. Fire brigade intervention on-site. ***Wed 25/10/23 10:06:*** Stop of cooling circuit for BA6, user interlock alarm. Confirmed to be an interlock sent by the vacuum controls, vacuum was degassing in the MST circuit which caused the interlock. Circuit restarted remotely by TI.

	Fri 27/10/23 21:17: Multiple fire alarms and evacuation activated in BA5. Ventilation units stopped on interlock from the fire alarms. Fire brigade on-site, rearmed the doors. When ventilation started the doors closed again. Second try, but same problem. Very hard to reach the piquet for the fire detection (DEF piquet, external, not CERN). In the end ZORA piquet managed to shunt the faulty sensors, with the agreement of the DSO. ***Sat 28/10/23 03:26:*** Fire alarms in US15, several sensors in alarm. Atlas don't see anything on cameras. Firebrigade calls TI, they smell smoke in the cavern. Nothing was found during the access in the cavern, smell of smoke not present anymore. Alarms reset and cavern closed for beam. ***Sat 28/10/23 20:15:*** Water leak on the demineralised water production in Meyrin. The leak was detected by TI on-site after having tried to reset a fault, that couldn't be reset remotely. The leak was repaired temporarily with help from the CV piquet, until a more permanent repair can be done.  ***Sun 29/10/23 00:02:*** Trip of electrical breaker powering WorldFip caused a loss of CRYO conditions, followed by a quench of the inner triplet R1. TI on-site to rearm the breaker, which allowed to restart quickly the CRYO. 
Plans	

Intervention Request				
Yes / No	**Duration**		**Preferred date/time**	
Reason				
Impact				

Linac 4					
Machine Coordinator last week	J-B Lallement				
Machine Coordinator this week	Piotr				
Statistics					
Availability	99.9%				
Facility Status					
Summary	Quiet week with only few minor faults.				
Issues	Thursday night: 3 MeV chopper trip – 4 minutes. Saturday night: MEBT steerer power converter fault – 3 minutes. Sunday morning: Source HV faults – Autopilot reset supplies – 6 minutes.				
Plans	High intensity MD Monday 8:00 to Tuesday 12:00 with source current ramped-up to 50 mA.				
Intervention Request					
Yes / No	***Duration***		***Preferred date/time***		
Reason					
Impact					

PS Booster				
Machine Coordinator last week	F. Asvesta			
Machine Coordinator this week	G.P. Di Giovanni			
Beam Scheduled				
ISOLDE	Yes		***PS***	Yes
Beam Availability by Destination (AFT)				
ISOLDE	99.8 %		***PS***	99.9 %
Facility Status				
Summary	• Operational and MD beams delivered without any significant issues • Tests on BTY.BPM152, revealed an EMI with BTY.DHZ152 that affects the response of the BPM. Experts will follow up the issue during YETS.			
Issues	• Distributor reset, only 3min of downtime on Thursday • Extraction kicker of R4, BE4.KFA14L1, in fault on Tuesday. Faulty unit causing a thermal interlock was exchanged. PSB operating in degraded mode (no R4) for ~1h in total. • On Wednesday night, water was observed in front of the PAD YEA01.PSB=361. Follow up from TI during the night and ACE in the morning, showed that the water was due to works in the building, not related to PSB.			
Plans	• Dedicated high current Linac 4 PSB MD and Instability measurements with matched kicker termination.			
Intervention Request				
Yes	***Duration***	1h	***Preferred date/time***	Monday 8h00
Reason	Regular visual inspections of magnets for water leaks			
Impact	-			

ISOLDE

Machine Supervisor last week	Simon Mataguez
Machine Supervisor this week	Miguel Lozano Benito

Beam Scheduled

GPS	Yes	***HRS***	Yes	***HIE-ISO***	Yes

Beam Availability by Destination (AFT)

GPS	96.8%	***HRS***	99.2%	***GPS+HIE-ISO***	86 %

Facility Status

Summary	Smooth week at ISOLDE with physics, MDs and preparation of preirradiated targets for the winter physics in parallel. GPS: - 25/10 8:00 End of IDS Test 132,133,134,135In (p on convertor). - 25/10 11:00-17.00 Rb83 collections to GLM. - 25/10 17:00- 26/10 07:00 irradiation of #836 for Winter physics but at 7.00 target has developed a vacuum leak. - 26/10 14:00 Booster test (non-standard response of the BTY.BPM152) - 27/10 09:30 GPS Target Change. New #761 UC -> OLD #836 – Access needed to fix issue with Robot (target not engaged in the gripper) - 27/10 17:00 cold Target #761 irradiated - 29/10 18:30 Target #761 vacuum tripped and protons request remains on (0,5uA) HRS: - 25/10 Set up for IDS (39K) as VITO run cancelled. - 26/10 Proton scan - 26/10 IDS runs until Saturday 28/10 morning 7:00 - 28/10 7:00 to 29/10 02:00 Miracls - 29/10 02:00 IDS takes over and stops at 12 on Sunday 12:00 - 29/10 12:00 Target #817 started cooling down, Proton request is left ON. (GPS) REX/HIE-ISOLDE: - Setup of the Linac using a pilot beam with A/q=2.0 in preparation for physics from GPS front-end to ISS (IS692, 7Be3+/7Be4+) at 11.0 MeV/u). - 25,26,27/10 Phasing of the lilac - 27/10 Reference set-up A/q=2.333 done - 27/10 Machine set to A/q=1.75 for the weekend to check the stability
Issues	- GPS target and line heating trips (3 times, ~ 2.5 h downtime). - HRS target heating trips (1 times (29/10 02.10, ~ 1.0 h downtime) - Trip of electrostatic elements in GPS separator. - 25/10 GPS -HTFactory.HT2 tripped – interlock sparking. - 30/10 Several trips of SRF cavities (SRF13, 16,17,19) and 7GP2 during the weekend.
Plans	

Intervention Request

Yes / No	***Duration***		***Preferred date/time***	
Reason				
Impact				

PS							
Machine Coordinator last week	Matthew Fraser						
Machine Coordinator this week	Ewan Maclean						
Beam Scheduled							
East Area	Yes	***nTOF***	Yes	***AD***	Yes	***SPS***	Yes
Beam Availability by Destination (AFT)							
AD	98.9 %	***EA N***	98.9%	***EA T8***	98.9%	***EA T9***	98.9%
nTOF	98.9%	***SPS***	98.9%				
Facility Status							
Summary	• CHIMERA continued to take beam • n_TOF dedicated cycle set-up at 400e10 ppp • High Intensity LHC25 dedicated MD (MD11263_LHC25#72b) for Wednesday with beam sent SPS. MD availability poor: KFA45 synchronisation drift problem + cfc-365-reth1 front-end down preventing injection (EPC piquet needed to power cycle the FEC) + LHC filling • High Intensity SFTPRO test postponed to next year by IEFC (risk to CHIMERA physics) • M_TOF up to 2x 750e10 ppp: bunch length looking better ~ 40 ns						
Issues	• KFA45 synchronisation with the beam drifted in on all users on Wednesday: suspected that the drift stabilisation loop failed (seems to be confirmed by IPOC: PID controller disabled (in open loop now), being followed-up by SY-ABT. • T11 radiation alarm Friday morning (PAXEA11D and PAXEA11 levels clearly raised): at 4:13 kicker module failed and parasitic TOF was partially extracted to EAST: comparator worked and but internal dump fired a bit late, comparator check adjusted 100 ms earlier. • Trips of SMH57 continue: fast abort due to temperature: chilled water temperature went too high: 20C (normally around 17C), chiller unit was out of action and fixed • POPS tripped during CHIMERA MD over the weekend needing EPC piquet to reset						
Plans	• Continue beam production for AD-ELENA						
Intervention Request							
Yes	***Duration***	~ 1h TBC		***Preferred date/time***	TBC		
Reason	To repair C10-56: short circuit on the pre-driver						
Impact	Access to PSR						

PS East Area							
Facility Coordinator last week	**D. Banerjee**						
Facility Coordinator this week	**NA**						
Beam Scheduled							
T8	Yes	***T9***	Yes	***T10***	Yes	***T11***	Yes
Beam Availability by Destination (AFT)							
Running T8	99.1%	***T9***	99.1%	***T10***	98.5%	***T11***	99.1%
Facility Status							
Summary	T09/T10/T11: Good Operation.						
Issues	T10: BHZ027 MCB error. Fixed by EPC.						
Plans	End of operation and start of YETS						
Intervention Request							
Yes / No	***Duration***		***Preferred date/time***				
Reason							
Impact							

PS nTOF				
Facility Coordinator last week	Michael Bacak			
Facility Coordinator this week	Michael Bacak			
Beam Requested				
Yes				
Facility Status				
Summary	Physics programme successfully completed			
Issues	No issues			
Plans	Dismounting experiments. Starting YETS activities with clean-up			
Foreseen Beam Stop				
no	***Duration***	-	***Date/Time***	-

AD - ELENA				
Machine Supervisor last week	Lajos Bojtar			
Machine Supervisor this week	Laurette Ponce			
Beam Scheduled				
AD	Yes		***ELENA***	Yes
Availability (AFT)				
AD	88.2 %		***ELENA***	88.2 %
Facility Status				
Summary	Very good week, only one reset of the DR.QUAD.			
Issues	DR.QUAD was down for ½ hours. The restart is still difficult, but managed without calling FL.			
Plans	No more MD's this year. Beam to physics in the remaining 2 weeks.			
Intervention Request				
No	***Duration***		***Preferred date/time***	
Reason				
Impact				

SPS

Machine Coordinator last week	M. Schenk
Machine Coordinator this week	--

Beam Scheduled

LHC	Yes	***NA***	Yes	***AWAKE***	No	***HiRadMat***	No

Beam Availability by Destination (AFT)

LHC	97.5%	***NA***	72.0%	***AWAKE***	--%	***HiRadMat***	--%

Facility Status

Summary

Planned for the last week of this year's run were ion beam physics for LHC and North Area (NA), a short-parallel ion MD on resonance compensation, and a dedicated high-intensity proton MD (wire-scanner stress test).

SFTION / NA

- Assessed damage caused by fire on Saturday (Wk 42). RP clearance to access TCC2 for in-situ inspection of MSN.X0220031 magnet on Monday.
- Likely cause of fire: inter-turn short. Agreed with experts not to replace given limited run time and spare situation. Adjacent equipment OK. Despite broken MSN, beam to H2 & H8 possible.
- Physics restarted Tuesday evening, following clean-up of area, tests, and consultation with equipment, services, and safety experts, as well as physics coordinator, head of OP, and BE department deputy head.
- OP shortened NA magnet pulsing time and put temporary protection mechanism in place in collaboration with EPC.

LHC: fills for physics and optics measurements.

AWAKE: follow-up on instability seen in Wk 42. Mitigation thanks to improved voltage programs.

MDs

- **Short-parallel:** octupole resonance compensation, very limited beam time due to long, frequent LHC (re)fills.
- **Dedicated:** Monday: ~3 h MD preparation as machine otherwise idle (no NA beam). Wednesday: only ~2 h of beam time given issues with PS injection and frequent / long LHC (re)fills. Nevertheless, unprecedented 2.57×10^{11} ppb injected in the SPS and accelerated to flat top (bunch length: 1.84 ns) with overall transmission ~93%. Wire-scanner stress test not possible: not enough beam time.

Issues

- NA MSN.X0220031 magnet broken following fire incident Saturday (Wk 42).
- Following a false fire alarm in SPS Ring (BA5) on Friday evening, faced an issue with the evacuation system during the entire night: return signal of Beam Imminent Warning (BIW) stuck. Bypassed in agreement with OP head and experts following risk assessment. Third-party piquet could not intervene during the night, but did intervention the following morning. Recurring fault, requires follow-up.
- Various main rf cavity trips (mainly C1).

Plans

Start of YETS

Intervention Request

No	***Duration***		***Preferred date/time***	
Reason				
Impact				

SPS North Area							
Facility Coordinator last week	D. Banerjee						
Facility Coordinator this week	-						
Beam Scheduled							
H2	Yes/No	***H6***	No	***K12***	Yes/No	***P42***	Yes/No
H4	Yes/No	***H8***	Yes/No	***M2***	Yes/No	***TT20***	Yes/No
Beam Availability by Destination (AFT)							
H2	62.9%	***H6***	NA	***K12***	NA	***P42***	NA
H4	62.9%	***H8***	62.9%	***M2***	NA	***TT20***	62.9%

Facility Status	
Summary	H2: Smooth operation. H8: Users from H4 (AMS L0) also installed in H8 following the fire in TCC2 which disabled the H4 line, good joint operation.
Issues	Thursday evening, the two dipoles X021027 and X021031 went to standby from the protection that OP put in place. The exact reason is investigated by OP / EPC.
Plans	End of operation and YETS starting.

Intervention Request				
Yes / No	***Duration***		***Preferred date/time***	

SPS AWAKE				
Facility Coordinator last week	Giovanni Zevi Della Porta			
Facility Coordinator this week	-			
Facility Status				
Summary	Laser intervention: • Change magnification of UV on photocathode to reduce electron beam emittance Electron beam tests: • Optics: commission optics with focus at different positions in plasma • Commission steering with last two magnets in vacuum and in plasma			
Issues	•			
Plans	• Start of SPS-related work in TAG41 • Laser-plasma experiments in TCC4			
Foreseen beam stop				
Yes / No	***Duration***		***date/time***	

Linac 3				
Machine Supervisor last week	D. Küchler			
Machine Supervisor this week	G. Bellodi			
Statistics				
Availability	99.7 %			
Facility Status				
Ion species	lead			
Summary	Good week with stable beam and high intensity around 33 eμA out of the linac).			
Issues	- Wednesday short interruption do to stop of source extraction. OK after a reset of the power converter. - Regular short (5-10 minutes) drops of intensity and stability. Less than 10 per day. No intervention needed. - Do to misconfiguration issue with ITF.BCT25 on user MDEARLY. Reason unknown.			
Plans	- Continue operation until Wednesday 6:00. - Wednesday morning MD with lead beam. - From Wednesday afternoon until following week MD with oxygen beam.			
Intervention Request				
Yes / No	***Duration***		***Preferred date/time***	
Reason				
Impact				

LEIR				
Machine Supervisor last week	Christian Carli			
Machine Supervisor this week	Michele Bozzolan			
Statistics				
Availability				
Facility Status				
Ion species	Pb54+			
Summary	▪ Stable operation with EARLY, MDNOM and NOMINAL cycles. ▪ Intensity increase towards the end of the week by re-tuning momentum ramping. Increase of the duration of the injection bump was the first parameter allowing an increase. ▪ Various MDs and tests (optics, momentum ramping) in parallel			
Issues	▪ No downtime during whole week??			
Plans	▪ EA physics until Wednesday morning ▪ Tests with O in week 45			
Intervention Request				
Yes / No	***Duration***		***Preferred date/time***	
Reason				
Impact				

LHC					
Machine Coordinator last week	R. Bruce				
Machine Coordinator this week	-				
Statistics					
Availability	84% (until Sun evening)		***Stable Beam Ratio***	49% (excluding MD)	
Facility Status					
Summary	- The last week of the run was mainly dedicated to physics production, with good availability. The total integrated luminosity in ALICE, ATLAS, CMS and LHCb are 2.16, 1.91, 2.1 and 0.225 (preliminary), respectively. For the whole week we operated with levelled luminosity at 3.5E27 cm^{-2} s^{-1} except for a 10 minute test asked by ATLAS/CMS with head on collisions. - In the first part of the week, several fills were dumped because of beam losses or other short failures (see below). Temporarily, we stepped back to 960b fills to reduced risks of dumps, in particular during the ramp. By the end of the week (and after an adjustment of BLM thresholds), we could re-establish successfully the operation with 1080b. - A short test was dedicated to the measurements of optics during the ramp and dispersion at top energy. Optics quality is good up to 5.4 Z TeV, however a beta beating up to 20% and slightly above is observed above this energy. At flat top, the beating is good again. Correlation to ramp losses is to be studied. - About 1h was taken for a beam-beam long-range MD where the crossing angles in various IPs were reduced to study the crossing angle limits. - The last 6h of the run were dedicated to the “BFPP quench test”. The main results is that a quench occurred of the dipole MB.B11L1 from the one-electron ions coming out of the ATLAS collisions at a luminosity of 2E27 $cm^{-2}s^{-1}$. It is noted that the preparation of this test required a short fill for loss maps (done on Sat.) because it was realized that the quench could affect a magnet with a weak diode close to the dipole magnet to be quenched.				-
Issues	- In the first part of the week, several fills were dumped to beam losses in the ramp, “10Hz events” and short failures. This observed degradation in the ramp is not fully clear. It was mitigated by increasing the thresholds of some collimators in the fast running sums around 82ms. - Lost half a shift on Saturday night due to the opening of a power breaker which made cryo instrumentation lose powering, and other circuits did a slow power abort. Quench heaters fired in the triplet (RQX.R1). - A fire alarm in P1 required a premature OP dump of a physics fill and an intervention of the fire brigade team that caused a loss of patrol, for a total loss of about half a shift.				-
Plans	End of the 2023 run at 6h00 on Monday.				
Intervention Request					
No	***Duration***	-	***Preferred date/time***	-	

CLEAR	
Facility Coordinator last week	Avni Aksoy
Facility Coordinator this week	Laurence Wroe
Facility Status	
Summary	• Couple of days planned for testing Coherent Cherenkov diffraction radiation (CChDR) BLM being developed for use in FCC. • Machine tuned to obtain short bunches desired for user's equipment. However, an issue with their laser system meant useful data could not be obtained. • Rest of the week used for MD. In particular, tools were developed and written for calculating doses delivered using flat/uniform electron beams
Issues	• Water leak into the control room (fixed) • Bug with the patrol system whereby the alarm was triggered for the material door despite it remaining closed
Plans	• Experimental analysis of the tools developed • Broadband pick ups experiment taking place next week