

10 July 2023

ACCELERATORS & EXPERIMENTAL FACILITIES STATUS

SUMMARY OF WEEK 27 - 2023

Technical infrastructure – *J. Nielsen*

Linac 4 – *G. Bellodi*

PS Booster – *C. Bracco*

ISOLDE – *E. Siesling*

PS – *R. Garcia Alia*

PS – East Area – *J. Bernhard*

PS – nTOF – *N. Patronis*

AD – ELENA – *B. Lefort*

SPS – *G. Papotti*

SPS – North Area – *J. Bernhard*

SPS – AWAKE – *G. Zevi Della Porta*

SPS – HiRadMat – *Not running – No report*

Linac 3 – *R. Scrivens*

LEIR – *Not running – No report*

LHC – *D. Nisbet*

CLEAR – *W. Farabolini & P. Korysko*

Technical Infrastructure (TI)				
Facility Coordinator last week		Jesper Nielsen		
Facility Coordinator this week		Ronan Ledru		
Statistics				
Alarms	21844			
Phone calls	835	Incoming	548	Outgoing 287
ODMs	119			
Facility Status				
Summary	Thursday 06/07 at 16:00			
	Increased of the temperature of the Beam Position Monitoring racks in SR1 BPM piquet onsite found a faulty valve, but he has no spare. EN-CV piquet find a temporary fix pending another intervention.			
	Friday 07/07 at 00 :00			
	Following the issue of the 3rd of July on the PM85 lift which was not solved: LHC op planned an access at PM85 on Friday 07/07 at 00:00 for QPS team. Lift Technician was called to check the lift before accessing. Solving the issue took more time than expected, QPS access was a bit delayed. End of lift intervention at 03:33			
Issues	Friday 07/07 at 13h40			
	TI operator mistakenly stop the BA6 Power supply fine water circuit instead of the septum magnet circuit. SPS stopped for 5 minutes.			
Plans				
Intervention Request				
No	Duration		Preferred date/time	
Reason				
Impact				

Linac 4			
Machine Coordinator last week	G Bellodi		
Machine Coordinator this week	J-B Lallement		
Statistics			
Availability	~100%		
Facility Status			
Summary	Excellent week		
Issues	RFQ trip Small cluster of 3 BDs => Level 1 Recovery [2 min]		
Plans	Regular operation		
Intervention Request			
Yes	Duration	1h	Preferred date/time
Reason	Repair BSM1 motor		
Impact	Stop for all beams		

PS Booster			
Machine Coordinator last week		Chiara Bracco	
Machine Coordinator this week		Gian Piero DI Giovanni	
Beam Scheduled			
ISOLDE	Yes	PS	Yes
Beam Availability by Destination (AFT)			
ISOLDE	99.6%	PS	99.6%
Facility Status			
Summary	<ul style="list-style-type: none"> - Prepared beam for HiRadMat: equivalent emittances were measured both in the PSB and the PS (2.4 um in both planes at PS flattop) - Injection steering was adjusted in Ring4 for LHC 36 bunches (found wrong timing for first turn estimation in YASP affecting orthogonal steering). This allowed to recover full homogeneity between the emittances in H and V plane for all rings (1.1-1.3 um) - PSB extraction was re-adjusted to lower the strength of the extraction kickers by a few kV in both R2 (from 55606 V to 53606 V) and R3 (from 57580 V to 53580 V) to reduce the risk of trips. The correction was propagated to MTE, TOF, EAST_T8, EAST_N, EAST_T9, AD,LHC, AWAKE and HiRadMat 		
Issues	<ul style="list-style-type: none"> - RFQ trip → level 1 recovery (2 min.) - Extraction kicker (KFA14 R2) trip, fixed with a reset (2 min.) - BR1.BCT showed increasing beam current during the cycle. Problem fixed by changing a LEMO connector - BI2.BSW1L1.1 trip (3 min.) - First failure of B-train on 03/07 (14 min.): a spurious spike of 580G in the marker signal triggered the correction much too early causing a trip of BR14.MPS on REG_ERROR. - Second failure of B-train on 06/07 affected beam quality and was first identified by the SPS when preparing for the LHC fill. The diagnosis of the problem took some time but could finally be attributed to sudden jumps of the B-train affecting POPS-b. The problem was solved by switching the B-train selection from chain 1 to chain 2 on Ring 1 and 4. According to the expert, this behavior is the symptom of a serious degradation of one or multiple components on the marker acquisition chain. The source of the anomaly will be identified (need that Ring 4 is not used for that) and, according to the findings, an access might be required to exchange faulty pieces, possibly during next TS, it will be confirmed at the beginning of this week. (actual beam stop 16 min but degraded beam quality for 7 h) 		
Plans	Deliver beam to downstream machines and for MDs		
Intervention Request			
Yes	Duration	1 hour	Preferred date/time July 13th
Reason	Regular inspection of BR.QFO11		
Impact			

ISOLDE					
Machine Supervisor last week		E. Siesling			
Machine Supervisor this week		M. Lozano			
Beam Scheduled					
GPS	No	HRS	Yes	HIE-ISO	No
Beam Availability by Destination (AFT)					
GPS	99.8%	HRS	98.9%	HIE-ISO	95.5%
Facility Status					
Summary	<p>GPS:</p> <ul style="list-style-type: none"> - New GPS Target #832 ThC installed last Thursday. - This week: Beam foreseen to GHM, GLM and LA1 for IS715 (nuclear clock). <p>HRS:</p> <ul style="list-style-type: none"> - Running with target #827 UC - IS714 taking many Chromium beams to the CRIS setup. - RILIS lasers running for the Cr ionization. - Very successful and smooth run with minor issues. <p>REX/HIE ISOLDE:</p> <ul style="list-style-type: none"> - The phasing of the HIE ISOLDE SRF linac was finished (M. Lozano, ISO OP) on Tuesday at A/q=4 and 7.58MeV/u - First stable 40Ar11+ beam from EBIS to the ISS / SPECMAT setup on Wednesday - First stable 22Ne6+ beam from EBIS to the ISS / SPECMAT setup as of Thursday and over the weekend – as per schedule - Due to common effort and hard work by the different RF specialists and ISO OP (M. Lozano) the goal of sending beam to the ISS users was achieved this week. - A few issues – see below. 				
	Issues	<p>GPS:</p> <ul style="list-style-type: none"> - Target (un)clamping issues on Thursday: manual manipulation of the compressed air valves was needed. A piston change as done at HRS last week is being considered to solve the issue. <p>HRS:</p> <ul style="list-style-type: none"> - Wednesday-night the HRS HT controls blocked – a reboot of its FEC did the job. - One of the ISCOOL power supplies seemed to jump to different aqn from time to time. Change for a spare solved the issue. <p>REX/HIE ISOLDE: Main issues:</p> <ul style="list-style-type: none"> - Friday-afternoon at Cryo Module 1 a SRF power amplifier broke and a CPU in the LLRF crate failed and needed replacing. A 4hrs intervention by D. Valuch and colleagues from BE-CEM brought the SRF of Cryo Module back alive. - During the weekend the rate at which the 7GAP3 amplifier trips increased significantly. Monday the RF specialist will have a look (G. Piccinini). At first glance only minor adjustment is expected. 			
Plans					
Intervention Request					
Yes / No	Duration		Preferred date/time		
Reason					
Impact					

PS							
Machine Coordinator last week		R. Garcia Alia					
Machine Coordinator this week		M. Fraser					
Beam Scheduled							
East Area	Yes	nTOF	Yes	AD	Yes	SPS	Yes
Beam Availability by Destination (AFT)							
(*) Issues with T10 power converter, resulting in a couple of hours of beam time, need to be included in AFT							
AD	98.6%	EA N (*)	98.6%	EA T8	98.6%	EA T9	98.6%
nTOF	98.6%	SPS	98.6%				
Facility Status							
Summary	Very good week in terms of availability						
Issues	<ul style="list-style-type: none"> Despite the limited impact on availability due to use of spares/alternatives, RF cavity status (e.g. C10-56, C80-88) needs to be carefully followed up, with a detailed characterization of the faults and the main purpose of decreasing the trips and downtime. Issues with T10 power converter persist and are currently mitigated through super-cycle composition. To be followed up by BE-EA. Cavity monitoring for LHC beams in SIS temporarily disabled due to issues with tripping cavities without beam. 						
Plans	<ul style="list-style-type: none"> Analyse cavity monitoring points to implement solution Follow-up on cavity faults and T10 power converter 						
Intervention Request							
Yes / No	Duration	Yes	Preferred date/time				
Reason	SEH23 position and TDI47 flowmeter would need to be checked, in the shadow of other interventions						
Impact							

PS East Area							
Facility Coordinator last week		J. Bernhard					
Facility Coordinator this week		D. Banerjee					
Beam Scheduled							
T8	Yes	T9	Yes	T10	Yes	T11	No
Beam Availability by Destination (AFT) General: 90.6%							
Running T8	99.2%	T9	99.2%	T10	98.1%	T11	N/A
Facility Status							
Summary	T09: IDEA DRC operation continuing without issues. T10: Good operation. T11: No user.						
Issues	T10: Timing issue with T10.BHZ027 (2 h downtime, but users went home for the night).						
Plans	<ul style="list-style-type: none"> T09: IDEA DRC → WCTE. Switch to low-momentum configuration. T10: ALICE ITS3 and ALICE Timing continue. 						
Intervention Request							
Yes / No	Duration	2 hrs		Preferred date/time	12 th July starting 8:00		
Reason	Switch to low momentum configuration for T09. Requires access to the mixed area. 8:00 start flushing for an access at 8:45 for about 2 hours.						
Impact	No extraction to the East (in shadow of T08/IRRAD/CHARM access).						

PS nTOF			
Facility Coordinator last week		Nikolas Patronis	
Facility Coordinator this week		Nikolas Patronis	
Beam Requested			
Yes			
Facility Status			
Summary		Progressing with physics programme according to planning	
Issues		No issues	
Plans		EAR1: $^{30}\text{Si}(n,\gamma)$ in data taking till 18.07.2023 EAR2: $^{243}\text{Am}(n,f)$ will stop on Tuesday 11.07.2023-10:00 to remove detection setups, RP check. Collimator change (diameter 6.7 cm \rightarrow 3cm) on Wednesday 12.07.2023-09:00 NEAR: Irradiation hardness studies in different materials (i-NEAR)	
Foreseen Beam Stop			
Yes	Duration	1) 3h 2) 8h	Date/Time
			1) 11.07.2023 10:00 2) 12.07.2023 09:00

AD - ELENA			
Machine Supervisor last week		Bertrand Lefort	
Machine Supervisor this week		Laurette Ponce	
Beam Scheduled			
AD	Yes/No	ELENA	Yes/No
Availability (AFT)			
AD	%	ELENA	%
Facility Status			
Summary	<ul style="list-style-type: none"> * first week of physics production, still missing ~10% of injected intensity in AD, 85% deceleration efficiency in both machines. * intensity fluctuation up to 10% in transfer lines, maybe correlated to AD-ELENA transfer stability problem. * First machine development in AD on Wednesday: <ul style="list-style-type: none"> - reduce pulsing of the first 2 dipoles in DI, unexpected behaviour of the first dipole, needed a correction of 5% to get the same magnetic field - automated BTF of stochastic cooling * Steering in transfer lines: <ul style="list-style-type: none"> - restearing of ALPHA line after warm-up of AEGIS magnet - first steering for ASACUSA-2 		
Issues	<ul style="list-style-type: none"> * regulation problem on QUAD.TRIM3 power supply (factor 2 delivered current) fixed on Monday * access in AD to exchange one amplifier and re-arm circuit breaker of the BBQ * 1 trip of the DR.QUAD, recurrent issue without solution but resetting. 		
Plans	* Physics production		
Intervention Request			
Yes / No	Duration		Preferred date/time
Reason			
Impact			

SPS							
Machine Coordinator last week		Giulia Papotti					
Machine Coordinator this week		Verena Kain					
Beam Scheduled							
LHC	Yes	NA	Yes	AWAKE	No	HiRadMat	No
Beam Availability by Destination (AFT)							
LHC	99.5%	NA	97.1%	AWAKE	--	HiRadMat	--
Facility Status							
Summary	<p>An astounding week for the SPS, with few and short faults (max half an hour). SFTPRO running stably. Changes in intensity on Tuesday to T2/T4/T6=30/83/9 and Friday to T2/T4/T6=32/74/45, with pertinent adjustments on the machine parameters. Occasional issues with the 100Hz over the weekend. Empty Bucket Channelling test on Thursday, managed to improve RF settings further (next step: operational procedures for managing drifts).</p> <p>LHC filling not straightforward in the beginning of the week, with long setting up time especially Wednesday (many parameters re-adjusted, including notably energy matching to PS which had drifted non-negligibly, trajectories, tune and Laslett corrections). "LHC filling like clockwork" on Saturday (cit.), with very few missed injections and scraping at 6-8%.</p> <p>Commissioning activities:</p> <ul style="list-style-type: none"> • Test of dynamic filling pattern in preparation for ions; • LHCINDIV 4 injections with 1.2e11 ppb in preparation for HRM; • LHCINDIV in Q26 preparation well advanced (for ions in transfer lines). <p>MDs:</p> <ul style="list-style-type: none"> • Wednesday: PS2SPS transfer suffered little availability; first studies on hysteresis modelling; bunched slow extraction (Empty Bucket Channelling). • Thursday: data gathered for brightness curve, data for 1.5-2.3e11 ppb 4x72 (e.g. 2.3e11 ppb, 2.5 um). Note: high intensity beams dumped below 30 GeV. Short validation of tool for automated longitudinal emittance blow up with 1.5e11 ppb to 450 GeV, successful. • Parallel MDs on: PS2SPS transfer; Q26 and Q22 growth rate versus chromaticity for headtail mode 0; optimization of phase jump for fixed target beam extraction. <p>Note: door surveillance YCPN01-SMI2 in PM12-Shaft-OK (TI2-Transfer) masked in SIS for the summer.</p>						
Issues	<p>Spikes in the wire scanner estimated temperature during high brightness MD on Thursday, worry for risk of damage; intensity reach MD program to be agreed on in the coming days.</p> <p>Coast on user LHC3: beams lost at start of coast, BLMs triggers, 800 MHz trips.</p> <p>Nice to have: SFTPRO adjustment by 50 buckets to avoid injecting into abort gap; reduction of V core emittance (2 um islands versus 3 um core).</p>						
Plans	<p>Standard SFTPRO+LHC week foreseen.</p> <p>Few beam stop requests:</p> <ul style="list-style-type: none"> • access for HRM preparation (2h BA7, will lose patrol of monte charge zone); likely in the shadow of LHC access (Thursday?); • 15' with no beam: in preparation for Tuesday MD (towards ions); • 15-30' with no beam: RF installation towards ions. 						
Intervention Request							
Yes / No	Duration			Preferred date/time			
Reason							
Impact							

SPS North Area							
Facility Coordinator last week		J. Bernhard					
Facility Coordinator this week		D. Banerjee					
Beam Scheduled							
H2	Yes	H6	Yes	K12	Yes	P42	Yes
H4	Yes	H8	Yes	M2	Yes	TT20	Yes
Beam Availability by Destination (AFT) General: 87.5%							
H2	96.1%	H6	96.1%	K12	96.1%	P42	96.1%
H4	96.1%	H8	96.1%	M2	96.1%	TT20	96.1%
Facility Status							
Summary	<p>H2/H4/H6/H8: No issues, good operation week. H6: Higher intensity week. Improved rate vs. radiation in PPE156 w.r.t. last time. M2: Installation week for NA64mu. No users. P42/K12: Checked correct TAX setting for optimum transmission in P42, steering on T10 (through T4) seems to be slightly dependent on the super-cycle composition (w/ and w/o LHC filling). T2/T4/T6 Sharing: 30 (T2) - 72 (T4) - 45 (T6) with 180 mm T4 target for better H8 electron purity, already adjusted on 07.07.23.</p>						
Issues	No faults, just some very few resets on power supplies needed.						
Plans	<ul style="list-style-type: none"> • H2: NA61/SHINE continues. • H4: RD51 and GIF++ continue. • H6: EP PIXEL (main), MONOLITH, EXFLU, ATLAS ITK PIXEL, ATLAS MALTA → ATLAS HGTD, ATLAS MALTA. • H8: ATLAS TileCal continues. • M2: AMBER → NA64mu. Beam commissioning for NA64mu to start from Monday coordinating the accesses with the users. • Request for 1 hour MD on 12.07.23, checking beam intensity and losses in P42 with RP in preparation for NA62 beam dump run starting on 20.07.23. 						
Intervention Request							
Yes / No	Duration	No	Preferred date/time		N/A		

SPS AWAKE

Facility Coordinator last week	Giovanni Zevi Della Porta		
Facility Coordinator this week	-		
Facility Status			
Summary	Connecting services to new Plasma Source. GSM cabling in TT41. Replaced laser beam dumps in proton line (LBDP2, LBDP3). Begun pump-down of beamline including new Plasma Source.		
Issues	Update on CTU timing issue: firmware problem identified, solution in progress.		
Plans	Bakeout of new Plasma Source. Continue GSM cabling. Laser compressor optics upgrade.		
Foreseen beam stop			
Yes / No	Duration		date/time

LHC			
Machine Coordinator last week		David Nisbet	
Machine Coordinator this week		Stefano Redaelli (to Thursday) then Matteo Solfaroli	
Statistics			
Availability	87.4%	Stable Beam Ratio	63.7%
Facility Status			
Summary	<p>Began the week with the last step of the intensity ramp up completed, and normal physics production with 2358b ready to begin. This was delayed on Monday while recovery from a heater induced quench was ongoing, followed by several other issues requiring access occurring consecutively.</p> <p>Monday night through to Wednesday morning was a period of good physics production (1.25 fb^{-1}).</p> <p>Wednesday morning we struggled to inject beam. Investigations found problems with laslett tune correction in the SPS, and also injection phase + energy matching to the PS (normally only checked on the 8b4e beam). Once understood and well tuned, very good injection performance (no warnings).</p> <p>Wednesday afternoon through to Thursday afternoon we had good production (1.44 fb^{-1}). Thursday evening we were affected by a problem with BPM cooling on the surface at P1 (failed regulator valve, no spares), followed by several issues including PSB not being available (B-train fault) and an access to P8 (unfortunately PM85 lift faulty so required fire brigade and lift maintenance).</p> <p>Friday morning, following a dump when reaching collisions (due to poor injected beam quality) we had a short access to non-tunnel areas, primarily to experiments. Several less-urgent access have been postponed to the next opportunity.</p> <p>Friday through Sunday night was an excellent period of production (3.3 fb^{-1}) with only one fill dumped by a fault (spurious crystal goniometer fault, seen previously on 2nd June). During the weekend we switched to a 2464b filling scheme (without INDIVs, used only by LHCb), which will be used regularly in the coming days.</p>		
Issues	<p>List of faults</p> <ol style="list-style-type: none"> 1. Faulty lift PM85 required long access on Thursday night 2. QPS EE heaters Fired Q7.L1 3. RB.A81 EE Circuit Breaker tripped 4. RCBV7.R8B1 Power Converter failed 5. LBDS TSU B1 – communication problem (electronics card with bad contacts?) 6. ATLAS Toroid fault following power cut 7. Crystal goniometer triggered spurious dump (happened already on June 2nd) 8. Beam quality issues caused significant downtime on Wednesday morning and Thursday night. However subsequent work to identify the critical parameters indicates the process is better understood (excellent performance over the weekend). 		
Plans	<p>Stable beams, alternating between 2358b and 2464b. Tentative date reserved for access on Thursday 13th July (morning).</p>		
Intervention Request			
Yes	Duration	4h	Preferred date/time
Thursday 13 th July			
Tunnel interventions postponed during the preceeding week. Highly likely access required by Thursday, but may be re-scheduled in the shadow of any other long fault.			

CLEAR

Facility Coordinator last week	Wilfrid Farabolini & Pierre Korysko
Facility Coordinator this week	Wilfrid Farabolini
Facility Status	
Summary	<p>Last week was dedicated to two experiments:</p> <ul style="list-style-type: none">- Bunch Length Monitor for FCC using the Coherent Cherenkov Diffraction Radiation.- Generating a Transversely Uniform electron bunches by tailoring the space charge forces and the magnetic field of the solenoid.
Issues	No major issue.
Plans	<p>This week is dedicated to Machine Development:</p> <ul style="list-style-type: none">- Dosimetry studies for Cancer Therapy with VHEE at UHDR.- One-to-One and Dispersion Free Steering Corrections.- Beam stability studies.

Linac 3			
Machine Supervisor last week	R. Scrivens		
Machine Supervisor this week	D. Kuchler		
Statistics			
Availability	N/A % - Commissioning		
Facility Status			
Ion species	Pb		
Summary	<p>The Pb beam was started up from the source. Stripper foils installed the week before, were inspected in vacuum and are ok and ready for beam. The ITL slits mechanics were cleaned and regreased, and did not block during further testing. The 14.5GHz klystron was exchanged with a spare, the operational one suffers from repetitive trips when starting up. To be seen if the spare is better. The RFQ could be set to nominal power, and Pb beam was sent through. Nevertheless the amplifier controls are still being worked on. The DSO test has to be postponed to 18 July.</p>		
Issues			
Plans	Conditioning of source, commissioning of RFQ and Cavity1 Amplifiers		
Intervention Request			
Yes / No	Duration		Preferred date/time
Reason			
Impact			