26 June 2023

ACCELERATORS & EXPERIMENTAL FACILITIES STATUS

SUMMARY OF WEEK 25 - 2023

Technical infrastructure – *J. Nielsen*

Linac 4 – *L. Timeo*

PS Booster – *F. Roncarolo*

ISOLDE – *E. Fadakis*

PS – *D. Cotte*

PS – East Area – *D. Banerjee*

PS – nTOF – *N. Patronis*

AD – ELENA – *L. Ponce*

SPS – *A. Spierer*

SPS – North Area – *D. Banerjee*

SPS – AWAKE – *G. Zevi Della Porta*

SPS – HiRadMat – *Not running, no report*

Linac 3 – *No report*

LEIR – *Not running, no report*

LHC – *M. Solfaroli*

CLEAR – *W. Farabilini, P. Korysko*

Technical Infrastructure (TI)					
Facility Coordinator last week	Jesper Nielsen				
Facility Coordinator this week	Jesper Nielsen				
Statistics					
Alarms					
Phone calls		***Incoming***		***Outgoing***	
ODMs					
Facility Status					
Summary	Very busy week in TI, with the Technical Stop and all the works going on, also quite a few events that require follow up and a rather extensive measure campaign for electrical consumption was carried out.				
Issues	Tue 20/06/23 11:00: During an intervention for filter cleaning / filter replacement of the cooling system on the BEQ1 compensator, the compensator tripped on low water flow. Tue 20/06/23 18:30: Communication problem for CRYO installations in RE82, TI on-site and detected a problem that caused 400V on the phases instead of 220V. It was later found by the piquet that the neutral line on the "canalis" had a mechanical problem Many equipments broke due to this higher voltage, including vacuum PLCs, FECs for CRYO. Wed 21/06/23 10:00: During the TIOC it was reported that the crane in LHC6 is not working correctly, and could cause a delay in some of the TS works. No of the remotes were working at all, it is being looked into whether this could be somehow related to the dismantling of the dumps that creates some radiation that could interfere with the remotes. It was also reported during the meeting that the lift of Linac 4 could most likely not be repaired during the TS. The spare parts received were not the good ones and ordering new ones could be not possible before closing the machines. Wed 21/06/23 16:25: Access system for LHC in fault. Impossible to enter or exit, also going through yellow doors. The problem was traced back to a cable that had been cut when opening the door on the controls cabinet during an intervention. Thu 22/06/23 01:35: RTE glitch caused PS RF trip. RTE confirm two glitches on the line 400kV SEREIN - VIELMOULIN at 22:28 and at 22:32 Thu 22/06/23 17:22: 3 electrical perturbations seen in TI but no impact on any machine. RTE did not detect anything on the network either.				

	Sun 25/06/23 18:13: PSEN alarm emergency stop EKD208/5E which powers the compressor station of CMS cryogenics. CMS magnet was (fortunately!) already off EN-EL clears the fault but it's impossible to reset the circuit breaker. Circuit breaker replaced with a spare one. 20:33 Cryo restarts the compressor station Full report available in the blog				
Plans					
Intervention Request					
Yes / No	**Duration**		**Preferred date/time**		
Reason					
Impact					

Linac 4				
Machine Coordinator last week	L. TIMEO			
Machine Coordinator this week	L. TIMEO			
Statistics				
Availability	99.7%			
Facility Status				
Summary	Regular operation + TS1. Before the technical stop, OP performed some reference measurements with the BSM1. During the restart, a problem with its motor/clutch emerged. The device is currently unavailable. Furthermore, found the signs of L4P.BCT.0117 and LTB.BCT60 inverted but promptly corrected. The BIS-CH-L4Z and BIS-CH-L4T had to be initialized and rearmed to produce the beam. On Sunday, the Low-Energy watchdog triggered a few times (user: TOF).			
Issues	Events which disrupted operation: 1. On Monday, a discharge in the CCDTL3 klystron's HV tank tripped the modulator (SY-EPC and SY-RF intervened during the technical stop) [downtime: 5min]. 2. On Wednesday, RPADG.363.LT.RBHZ30 encountered a "precharge" fault, which triggered the WIC. The cause of the fault is unclear. Specialists will investigate further [downtime: 8 minutes]. 3. On Thursday, another discharge occurred in the HV tank of the CCDTL3 klystron [downtime: 13 min].			
Plans	Regular operation.			
Intervention Request				
Yes	***Duration***	3h	***Preferred date/time***	
Reason	1. Finalise the elevator repair (3h). 2. Repair BSM1's motor/clutch (1h).			
Impact	All proton beams stopped.			

PS Booster				
Machine Coordinator last week	F.Roncarolo			
Machine Coordinator this week	R.Murillo Garcia			
Beam Scheduled				
ISOLDE	Yes		***PS***	Yes
Beam Availability by Destination (AFT)				
ISOLDE	95.5%		***PS***	95.5%
Facility Status				
Summary	• Delivery of operational and MD beams as requested by the users. • Planned iTS1 activities, recovery and related follow-up. (see also issues section)			
Issues	**BI1.BSW4 (Inj Bumper) found to have a water leak** at start of iTS1 om Tue: • agreed with OP to replace magnet during technical stop • **Wed: successfully changed magnet**, all reconnected, started to pump in the afternoon. Started to operate PSB in degraded mode, 3 rings (R2,3,4) • Thu early morning: vacuum level recovered, restarted R1 iTS1 recovery process included issues with: BT2.SMV20 blade, Ejection kickers, BI.BSW, LTB.QNO60 setting, BIS-CH-L4Z, BIS_CH-L4T, Linac4 BCT • Most issues related to lost or wrong settings, fixed one by one by OP with experts. • Post-mortem to improve next time: ongoing **Radial Steering – Radial Loop** issue after iTS1 • High losses at injection (not all rings, not all users) mitigated by changing the combination of PUs used by radial loop. Not blocking, BI and RF expert to fully understand fix the problem BI.BSW FGC and HW work during iTS1 • FGC Upgrade to restore the regulation warning completed • Found faulty capacitor bank explaining recent trips. HW fix in place but may need remote tuning till EYETS and possibly more HW change in EYETS WIC interlocks at BR34 • Sporadic occurrences being investigated, new diagnostics installed by TE-MSC BE3.KFA14L1 and BT1.KFA10 trips. Root source being investigated (as of Sunday night with piquet on site).			
Plans	Delivery of operational and MD beams, follow-up of post iTS1 issues above.			
Intervention Request				
Yes/No	***Duration***	30-45m	***Preferred date/time***	Thu 29 – 8:00
Reason	Inspection of QFO11 water leak			
Impact	Beam stop between 7:30 to to 8:30 - 45			

ISOLDE

Machine Supervisor last week	Lefteris Fadakis
Machine Supervisor this week	Miguel Benito

Beam Scheduled

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

Beam Availability by Destination (AFT)

GPS	% 93.5	***HRS***	% 94.2	***HIE-ISO***	% -

Facility Status

Summary	GPS Target #786 Cr beam used for RILIS development. HRS Experiment number: IS712 Users continue taking RaF beam to LA1 REX-HIE The RF experts solved the issue with the 9GAP amplifier on Friday evening. We can continue with phasing the REX-HIE LINAC
Issues	Reset of TGM during the latest TS has an effect of taking down our High Tension power supplies for both target stations. Situation has been communicated to the timing responsible. Recurring issue while changing targets on our front ends. Not possible to clamp/unclamp the target from the control room. Procedure needs to be forced by increasing the compressed air flow.
Plans	GPS Experiment number: IS673, IS725 Target change this morning #818 UC Beam to be used in GLM Beam line HRS Experiment number: IS712 Users continue to take beam until Thursday the 29th REX-HIE Continue phasing the REX-HIE LINAC. Need to phase the 9GAP and all of the SRF cavities Having a poor transmission through the REX-TRAP. Experts are working to get it back to nominal numbers.

Intervention Request

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

PS							
Machine Coordinator last week	Denis Cotte						
Machine Coordinator this week	Bettina Mikulec						
Beam Scheduled							
East Area	Yes	***nTOF***	Yes	***AD***	Yes	***SPS***	Yes
Beam Availability by Destination (AFT)							
AD	87.5%	***EA N***	87.5%	***EA T8***	87.5%	***EA T9***	87.5%
nTOF	86.5%	***SPS***	80.8%				
Facility Status							
Summary	It was a difficult week for the PS with a beam availability around 80%. The beginning of the week started without problems with the gradual stopping of the various beams in view of the "Technical Stop". No major OP issue during TS, we kept all patrols OK. Only PS-Ring S3 (Pont PS) had to be redone. Following the modifications of the KFA71 during the TS, the operation team readjusted KFA71 timings without issues. The return to operation proved more complicated with the absence of module 2 of our injection kicker KFA45 during the night from Wednesday to Thursday. During this night, KFA45 tripped several times on the three remaining modules. The problem was finally found to be a faulty LEMO-LEMO connector that was replaced on Thursday. Several 10Mhz cavities in short circuits required access on Wednesday afternoon to get 10 operational cavities. Cavity C10-11 remains broken, another access organized on Friday morning did not help to solve the problem. RF expert investigations to put it back in operation continue... For much of Friday, no production of the LHC multi-bunch beams was possible. A problem on the “Frequency Monitoring System” prevented the 20MHz cavities from pulsing. (Wrong reference frequency) For the rest of the week, the PS was in operation with only 10 cavities (10 MHz), blocking all operation in PS at the slightest failure of one of them. That was the case on Saturday when HLRF piquet had to intervene to restart the C10-56 cavity. The good news is that, on Friday, YASP has been tested and validated with BPMs in the IRRAD zone. Sunday a bad contact on a fan of transition doublets power supply prevented all PS beam crossing transition until intervention of the EPC piquet.						

<table>
<tr><td>Issues</td><td colspan="4">Tuesday: TT2 bending F16.BVT173 trips -> waterflow issue -> 40 minutes
Wednesday:
- 10MHz cavity accesses -> 3h28
- KFA45 in degraded mode (3/4 module available with many trips) -> 17h48
Thursday:
- Broken amplifier in central building preventing the PS to perform synchronization on H1 (MTE-BB) and H16LI (LHCINDIV-LHCPROBE) beams.
Friday:
- Bad reference cable on “Frequency Monitoring System” prevents 20MHz cavity to pulse -> No LHC multi-bunch beams -> 13h38
- Too many useless resets from CCC during the night reported by RF expert.
- PS access for C10-11 investigations -> 2h44

Saturday:
- Several trips of C10-56 -> HLRF piquet came on site -> 1h36
Sunday:
- Transition Doublet trip due to over temperature -> bad contact found on the power supply fan -> 1h23</td></tr>
<tr><td>Plans</td><td colspan="4">Follow-up cavity issues mainly on C10-11 and C80-88</td></tr>
<tr><td colspan="5">Intervention Request</td></tr>
<tr><td>No</td><td>Duration</td><td></td><td>Preferred date/time</td><td></td></tr>
<tr><td>Reason</td><td colspan="4"></td></tr>
<tr><td>Impact</td><td colspan="4"></td></tr>
</table>

PS East Area							
Facility Coordinator last week	**D. Banerjee**						
Facility Coordinator this week	**N. Charitonidis**						
Beam Scheduled							
T8	Yes	***T9***	Yes	***T10***	Yes	***T11***	No
Beam Availability by Destination (AFT) General: 90.6%							
Running T8	86.7%	***T9***	86.7%	***T10***	82.7%	***T11***	N/A
Facility Status							
Summary	T09: Smooth operation. T10: Mostly smooth operation. T11: No user.						
Issues	T09: Software issue for XBPF readout. Profiles unstable. Investigation ongoing. T10: Power converter of magnet T10.BHZ027 failed twice on Friday 23/06, otherwise smooth operation (total downtime about 4h09m).						
Plans	• T09: MUonE ECAL → IDEA DRC • T10: IDEA CC → Continue						
Intervention Request							
Yes / No	***Duration***		***Preferred date/time***				
Reason							
Impact							

PS n_TOF				
Facility Coordinator last week	N. Patronis			
Facility Coordinator this week	N. Patronis			
Beam Requested				
Yes				
Facility Status				
Summary	Progressing with physics programme according to planning			
Issues	No issues			
Plans	• EAR1: The ^{30}Si(n,g) measurement is in data taking mode. • EAR2: ^{243}Am(n,f) measurement is also running nicely and smoothly. • NEAR: no irradiation in the activation area (a-NEAR). In the irradiation area (i-NEAR) different material irradiation hardness studies are on-going.			
Foreseen Beam Stop				
No	***Duration***	-	***Date/Time***	-

AD - ELENA				
Machine Supervisor last week	Laurette Ponce			
Machine Supervisor this week	Bertrand Lefort			
Beam Scheduled				
AD	Yes/No		***ELENA***	Yes/No
Availability (AFT)				
AD	%		***ELENA***	%
Facility Status				
Summary	* Difficult week for beam commissioning because of technical stop and recovery after technical stop. - increased intensity on target to 1.5e13 protons, 3.7e7 pbars injected in AD and up to 85% deceleration efficiency - ELENA transmission as last year, 6e6 pbars per bunch at extraction * ALPHA and PUMA lines steering with Pbars			
Issues	* Noise on BPM system not fixed by intervention during TS * Frozen GFA controls of power converter DR.BHZTR08-09 causing current drift * trigger problem of BTVs in DI transfer line causing large fluctuation of images * 2 trips of DR.QUAD circuit * communcation problem on FGC93 in PUMA transfer lines * No BCCA data on Friday			
Plans	* target position/Horn optimization * automated BTF measurment of stochastic cooling * final copy of Hminus cycle settings to pbars cycle in ELENA * start of physics on 30/06			
Intervention Request				
Yes / No	***Duration***		***Preferred date/time***	
Reason				
Impact				

SPS							
Machine Coordinator last week	Arthur Spierer						
Machine Coordinator this week	Kevin Li						
Beam Scheduled							
LHC	Yes	***NA***	Yes	***AWAKE***	No	***HiRadMat***	No
Beam Availability by Destination (AFT)							
LHC	96%	***NA***	91.5%	***AWAKE***	%	***HiRadMat***	%
Facility Status							
Summary	**Technical Stop:** All the interventions went smoothly, including the wire scanner exchange in sector 4 and the scraper replacement in sector 1. The vacuum was recovered and the valves opened at 17:00 on Wednesday. The first beam was only back on Thursday morning at 4:00 due to the PSB leak intervention. Two access system issues when closing the machine are described below. **North area**: Beam stopped from Monday 7:00 to Thursday 18:00. The foil irradiation campaign was cancelled due to the PSB delay. The beam recovery and beam line setting up went smoothly as well as the rest of the week for physics. **LHC**: The scrubbing started on Thursday using the COLDEX cycle and continued throughout the week to reach the operational parameters for LHC (4x72 bunches with 1.6e11 ppb, 1.6ns bunch length at flat top). Vacuum valve interlock threshold were temporarily increased to 1e-5mbar in 1 and 4 to accelerate the process. The LHC took single bunch beams starting from Saturday. **MDs**: COLDEX run went smoothly on Monday, while it was perturbed on Thursday by the TS recovery and the need for scrubbing. An interlock due to the table not being fully retracted perturbed the operation and was solved by moving the table in and out again. **Crab cavities:** The MD was successfully carried out, with single bunch in coast to study emittance growth. BSRT measurements were used instead of wire scanners. Further calibration of the BSRT will be performed to extract absolute measurements. **Other progress**: *Wire scanners: Successful H and V scans on Friday evening with single bunch, nominal intensity, after controls issue were sorted. *EPC thermography test on one of the mains transformer *Test of the dynamic bunch pattern for ions *New interlock on dI/dt implemented and to be commissioned. *Wire scanners protection interlock in place (total intensity >4e13+bunch length <1.8ns)						
Issues	*Interlock from COLDEX table not fully retracted. *Two interventions on high level RF cavities 3 and 5 *PS RF preventing LHC single then multi-bunch after restart *Main TS issues: Faulty access system board in BA7 causing loss of all BA7 patrol, TAG42 patrol lost for unknown reason, request to use monte-charge in BA7 after the technical stop. *Delay due to PSB leaking magnet and PS RF *LHC beam 1 extraction prevented by BIS, had to be re-armed (TI2 up/down, SR2 inj 1.1, 1.2) difficult to debug because seen as kicker interlock.						
Plans	*HiRadMat does not take place this week (26), but will be replaced by ½-day of dedicated crab cavities MD (8h-13h) *Parallel MDs *LHC VdM program and intensity ramp up						
Intervention Request							
Yes / No	***Duration***		***Preferred date/time***				
Reason							
Impact							

SPS North Area

Facility Coordinator last week	**D. Banerjee**
Facility Coordinator this week	**N. Charitonidis**

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	86.1%	***H6***	86.1%	***K12***	86.1%	***P42***	86.1%
H4	86.1%	***H8***	86.1%	***M2***	86.1%	***TT20***	86.1%

Facility Status	
Summary	General: Smooth restart after TS1 in all H2/H4/H6/H8/M2/P42/K12 lines, no major faults. M2: AMBER aims to collect ~ 11k spills by Monday, 26th June. High intensity Drell Yan test planned between 30th June and 4th July. Sharing: 100-105 (T2) - 52 (T4) - 30 (T6).
Issues	Fault on a power converter in H2 that was sending "*bend unlimited"* signal to the LOKN that makes trip the North transfer chain.
Plans	• EHN2 and ECN3 – continue physics. • H2: LHCb ECAL continues. • H4: NA64e continues and plan to switch to hadron on Friday 30th of June • H6: ATLAS ITK PIXEL continues. EXFLU and CMS MTD Incoming • H8: LHCb (VELO, RICH in PPE138) + LHCb Muon (PPE168) --> IDEA DRC. • Sharing request: 30 (T2) - 52 (T4) - 100 (T6) from 30th June to 4th July. (TBC)

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	Transport of new Plasma Source from BB4 down to tunnel area (TCC4). Assembly work in the tunnel all week.			
Issues	Patrol loss in TAG41 as a consequence of TAG42 patrol loss. Will recover patrol once installation is complete			
Plans	Alignment of new Plasma Source. GSM work in TT41			
Foreseen beam stop				
Yes / No	***Duration***		***date/time***	

LHC

Machine Coordinator last week	M. Solfaroli
Machine Coordinator this week	E. Metral

Statistics

Availability	43.8% (calculated Sat-Mon)	***Stable Beam Ratio***	0%

Facility Status

Summary	Technical stop 1 from Monday 6am to Friday 4pm. The two RF busrt disks were not exchanged because the RF cavities (emptied but still cold) could not be depressurized sufficiently. The crystal collimator TCPCH.4L7 was re-installed on Monday, followed by vacuum bake-out and pump down. Bake out was completed on Friday morning then crystal commissioning took place until 9pm. Stress tests on the crystal and conditioning of MKD and MKI8 during night. Quite difficult re-start, with several problems when recovering from TS: • Three 120 A power converters needed special intervention by EPC piquet (2 remote, 1 access in IP2). • IP2 patrol to be redone, following a replacement of the key distributor. • Loss of the RF clocks from SR4 led to problem in RF power. • ALICE patrol was lost then redone. • During precycle, RB.A56 detected an earth fault and went into powering failure: tracked down to a hanging grounding cable (cost 8 hours). • INJ-BIC needed to be re-armed, due to reboot of the BIC crate during TS. Saturday night BLM validation test (following firmware update) and MP validation of VdM cycle. Problem with ADT (wrong or NO excitation) compromised partially the program. The loss maps for vdm were completed Sunday night. On Sunday successful 120m run covering 2 shifts.
Issues	
Plans	TOTEM pot alignment VdM cycle Nominal cycle revalidation Intensity ramp-up

Intervention Request

No	***Duration***		***Preferred date/time***	

CLEAR	
Facility Coordinator last week	Wilfrid Farabilini & Pierre Korysko
Facility Coordinator this week	Pierre Korysko
Facility Status	
Summary	Last week was dedicated to two experiments: - Study the Cherenkov light production and absorption in 3 Quartz Fibers as a function of the beam angle and the absorbed dose. This will be used to introduce correction factors to the ATLAS luminosity measurement. - Beam Profiler Detector tests for the Laser Und XFEL Experiment (LUXE) with INFN Padova.
Issues	No major issue.
Plans	This week is dedicated to CLEAR Machine Development.