

9 October 2023

ACCELERATORS & EXPERIMENTAL FACILITIES STATUS

SUMMARY OF WEEK 40 - 2023

Technical infrastructure – *R. Ledru*

Linac 4 – *G. Bellodi*

PS Booster – *R. Murillo Garcia*

ISOLDE – *E. Fadakis*

PS – *E. Maclean*

PS – East Area – *J. Bernhard*

PS – nTOF – *M. Bacak*

AD – ELENA – *P. Freyermuth*

SPS – *G. Papotti*

SPS – North Area – *J. Bernhard*

SPS – AWAKE – *G. Zevi Della Porta*

SPS – HiRadMat – *No report, not running*

Linac 3 – *R. Scrivens*

LEIR – *No report*

LHC – *M. Solfaroli*

CLEAR – *No report*

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	Quite a busy week and weekend with some rather complex events and a weekend with VIP visits in ATLAS and inauguration of the new science gateway.			
Issues	<p>Mon 02/10/23 13:03: The BA5 cooling station had a problem with one of the demineralised water pumps, the secondary pump started automatically, but caused a trip of the SPS. The cause is thought to be related to a pressure switch for the pump, which is being looked into. See event</p> <p>Tue 03/10/23 12:47: Trip of harmonic filters SEQ4 in LHC4, due to a bad measure on the trench relay. The relay was replaced and the filter was put back in service. A new type of relays is being tested for a possible install in LS3. See event</p> <p>Fri 06/10/23 12:39: Fire alarms in technical galleries below the SR2 building. The fire alarms interlocked the ventilation that is cooling down the power converters for ALICE. The fire alarms were caused by a company pulling cables, drilling the walls and therefore creating dust. The fire detection was not putted out of service before these works, no IS37 was created. TI demanded the works to be stopped via the Fire Brigade, after which the ventilation could be put back in service. Fortunately, and thanks to the quick intervention of all the teams involved, the temperatures didn't reach the thresholds of the power converters, although it was not far away. See event</p> <p>Sun 08/10/23 13:45: Trip of Linac 4 cooling station, the filling of the circuit seems to have filled the circuit too much or too quickly, which is most likely the cause of the trip. More investigations are ongoing to understand the timings of events. See event</p>			
Plans				
Intervention Request				
Yes / No	Duration		Preferred date/time	
Reason				
Impact				

Linac 4			
Machine Coordinator last week		G Bellodi	
Machine Coordinator this week		E Gousiou	
Statistics			
Availability	99%		
Facility Status			
Summary	A good week, with the main issue of a cooling water pump trip on Sunday morning.		
Issues	Tuesday: L4T.RQD.081 power converter trip (~10 min) Friday: PIMS78 breakdown, no sequencer action required to restart. (2.5 min) Saturday: chopper trip (5 min) Sunday: RF cooling water pump tripped (1h20 min)		
Plans	Regular operation		
Intervention Request			
Yes / No	Duration		Preferred date/time
Reason			
Impact			

PS Booster			
Machine Coordinator last week		Raul Murillo Garcia	
Machine Coordinator this week		Jean-Francois Comblin	
Beam Scheduled			
ISOLDE	Yes	PS	Yes
Beam Availability by Destination (AFT)			
ISOLDE	98.2%	PS	98.5%
Facility Status			
Summary	<ul style="list-style-type: none"> • Another very good week with high availability. • All operational and MD beams were delivered as requested. 		
Issues	<ul style="list-style-type: none"> • Tuesday: BT2.KFA20 misbehaved triggering the BT-BTY BCTWD which cut the beam for GPS. Ok after reset of the WD. • Wednesday: losses in all rings at low energy because an ISOLDE watchdog forced the RF to ramp down voltage and FREV. Ok after lowering the intensity. • Thursday: BTY.QDE113 and QDE120 tripped since they cannot cycle at 1.4 GeV and 1.7 GeV • Thursday: POPS-B tripped due to an interlock triggered by a door opened in the capacitor bank area. • Friday: POPS-B (RPOPQ.245.BR.RQFO) tripped twice on user MD1 (12) because of too high di/dt in the function. • Sunday: beam lost after BI watchdog. Ok after reset. 		
Plans			
Intervention Request			
Maybe	Duration	1h	Preferred date/time 11 th of October
Reason	Visual inspection for water leak on BR.QFO11 and BI.BSW		
Impact	No proton beam for downstream machines/facilities		

ISOLDE					
Machine Supervisor last week		Lefteris Fadakis			
Machine Supervisor this week		Erwin Siesling			
Beam Scheduled					
GPS	Yes	HRS	Yes	HIE-ISO	Yes
Beam Availability by Destination (AFT)					
GPS	%96.1	HRS	%97.2	HIE-ISO	%97.2
Facility Status					
Summary	<p>MINIBAL (IS595) took beam from HRS starting on the 4th. On GPS two users (IS688, IS691) performing collections on GLM. On the 5th, OP tested if we could send protons simultaneously on both targets on HRS. One for ISOLDE HRS (normal position). One for MEDICIS, shooting protons lower than the normal target. Test was a success. MD6 was used. Many thanks to Jose from PSB for his prompt response and expertise.</p>				
Issues	<p>Main issue for HRS-REX-HIE was the multiple HT trips and several trips of one SRF cavity (XLH1.CAV1). For GPS 1 issue with RILIS. 1 time the line heating of the front end tripped. A few trips of the HT.</p>				
Plans	<p>MINIBAL will continue taking beam from HRS until the 11th. We will start setting up the machine to deliver beam (¹³⁰Sn) to the next experiment (MINIBAL) on the same day</p>				
Intervention Request					
Yes / No	Duration		Preferred date/time		
Reason					
Impact					

PS							
Machine Coordinator last week		Ewen Maclean					
Machine Coordinator this week		Bettina Mikulec					
Beam Scheduled							
East Area	Yes	nTOF	Yes	AD	Yes	SPS	Yes
Beam Availability by Destination (AFT)							
AD	97.7%	EA N	97.7%	EA T8	97.7%	EA T9	97.7%
nTOF	97.7%	SPS	97.7%				
Facility Status							
Summary	Very Good availability. Low intensity parasitic N-TOF sent Wed-Friday. Increase of T8 bunch intensity from 60e10 to 80e10 implemented since Thursday accompanied by change to EAST thresholds (now independent thresholds on EAST users). Started setup of oxygen cycle. Fix of TT2 BPM251 via gate selection on ION user. Regular checks of ion splitting.						
Issues	Sequencer error on BWS65 Issue with TMS application on flat cycle SMH16 bad pulses C80-08 tripping associated with MHFB Several occasions with erratic behaviour of T9 autopilot						
Plans	Expect further request for low intensity ntof after tof access Tuesday or Wednesday						
Intervention Request							
No	Duration		Preferred date/time				
Reason							
Impact							

PS East Area							
<i>Facility Coordinator last week</i>		J. Bernhard					
<i>Facility Coordinator this week</i>		D. Banerjee					
Beam Scheduled							
<i>T8</i>	Yes	<i>T9</i>	Yes	<i>T10</i>	Yes	<i>T11</i>	Yes
Beam Availability by Destination (AFT)							
<i>Running T8</i>	97.7%	<i>T9</i>	97.7%	<i>T10</i>	97.7%	<i>T11</i>	97.7%
Facility Status							
<i>Summary</i>	T09/T10/T11: Good operation.						
<i>Issues</i>	<ul style="list-style-type: none"> Beam off T09 target on Wednesday, leading to low count rate of secondary beam. Quickly fixed by manual re-steering. In general, new autosteering works very well. Building lighting off last Wednesday evening due to unannounced maintenance, solved by EL piquet called in by PS/PI operators. 						
<i>Plans</i>	T09: OREO → ALICE FOCAL. T10: ALICE RICH, EIC dRICH continue. T11: CLOUD continues.						
Intervention Request							
Yes / No	<i>Duration</i>		<i>Preferred date/time</i>				
<i>Reason</i>							
<i>Impact</i>							

PS nTOF			
<i>Facility Coordinator last week</i>		Michael Bacak	
<i>Facility Coordinator this week</i>		Michael Bacak	
Beam Requested			
Yes			
Facility Status			
<i>Summary</i>		Physics programme according to schedule	
<i>Issues</i>		Implosion of small vacuum chamber window. Detector and sample unfortunately destroyed.	
<i>Plans</i>		<ul style="list-style-type: none"> • EAR1: Data taking with new transmission station ongoing. First gaseous transmission sample will be installed this week. • EAR2: Change to in beam silicon detector tests mid week. • NEAR: Intervention on the 10th or 11th October to modify diamond detector setup. 	
Foreseen Beam Stop			
yes	<i>Duration</i>	6-8h	<i>Date/Time</i>
			10 th or 11 th October (tbc)/08h00

AD - ELENA			
Machine Supervisor last week		P.Freyermuth	
Machine Supervisor this week		B.Dupuy	
Beam Scheduled			
AD	Yes	ELENA	Yes
Availability (AFT)			
AD	98%	ELENA	100%
Facility Status			
Summary	AD: Stochastic Cooling experts made good use of the MD time and manage to improve significantly the 2GeV/c cooling efficiency. ELENA run smoothly.		
Issues	AD: 3 trips of the main quads, among one needed the first line to come by night. It happens again the quad-trim3 badly behaved. To fix this issue, the reference function has to be multiplied or divided by 2.		
Plans			
Intervention Request			
Yes / No	Duration		Preferred date/time
Reason			
Impact			

SPS							
Machine Coordinator last week		Giulia Papotti					
Machine Coordinator this week		Arthur Spierer					
Beam Scheduled							
LHC	Yes	NA	Yes	AWAKE	Yes	HiRadMat	No
Beam Availability by Destination (AFT)							
LHC	99.4%	NA	88.6%	AWAKE	98.9%	HiRadMat	-
Facility Status							
Summary	<p>Monday: start of ion physics. Spent the day improving the spill quality, also thanks to observables from NA61 (plus TT20 and TT23 BSIs). NA61 at the user meeting reported they now have the “optimal spill structure (50% more efficient than in 2022)”! Main change: slope added to the T2 transfer momentum.</p> <p>Sunday: start of AWAKE Run 4. Beam for AWAKE checked on Friday during working hours: losses at extraction required orbit flattening, RF 200 MHz system required re-conditioning.</p> <p>(unlucky) MDs:</p> <ul style="list-style-type: none"> - (Very) long parallel MD on Thursday: SFTION1 + 14-inj cycle (98.6s long super cycle), half day lost. - Parallel MDs on Monday, Tuesday, Friday (4h, last minute addition, no beam basically received). 						
Issues	<ul style="list-style-type: none"> - LHC filling often detected as “no beam from injectors” by automatic fault tracking, manually cleaned up. - 2 trips of ion interlock due to wrong supercycle sequence, sequence editor updated with improved warnings. - Problem with the "Not used extraction sextupoles" for Friday MD: one power converter is faulty, and 2 others do not pulse, to be checked with First Line. 						
Plans	NA ion physics + AWAKE Run 4 (AWAKE dedicated during source refill)						
Intervention Request							
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	No	K12	No	P42	No
H4	Yes	H8	Yes	M2	No	TT20	Yes
Beam Availability by Destination (AFT)							
H2	88%	H6	N/A	K12	N/A	P42	N/A
H4	88%	H8	88%	M2	N/A	TT20	88%
Facility Status							
Summary	H2: Ion beam commissioning completed; beam given to users ahead of time. H4: Ion beam commissioning completed; beam given to users ahead of time. H8: Ion commissioning completed in time; new 200mm polyethylene target installed in XCON.042.130 for better fragmentation. Smooth operation.						
Issues	No issues.						
Plans	H2: NA61 continues. H4: PAN → HERD. H8: VLAST → NA60+.						
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	Monday-Saturday: <ul style="list-style-type: none"> • Completed installation of mu-metal around plasma cell • Laser contractor solved the pre-pulse issue and improved UV intensity on photocathode • Mounted 10 new cameras for plasma light • Patrolled area 		
	Sunday: stated new proton run <ul style="list-style-type: none"> • Begin with access for Rb density measurements • Stable proton beam (no LHC): 1509 bunches in 7.2 hours • Set up diagnostics and DAQ • Determine settings and scan timing for 10 new cameras • Commission electron beam with improved UV intensity 		
Issues	•		
Plans	<ul style="list-style-type: none"> • Study proton-driven plasma light (a proxy for plasma wakefields) as a function of density step • Study electron-driven plasma light in preparation for acceleration experiments 		
Foreseen beam stop			
Yes / No	Duration		date/time

LHC			
Machine Coordinator last week		M.Solfaroli	
Machine Coordinator this week		J.Wenninger	
Statistics			
Availability	57.7%	Stable Beam Ratio	27.7%
Facility Status			
Summary	<p>VdM scans for LHCb and ATLAS were completed Monday. The master thresholds for the TCT BLMs (except IP8) were adapted, followed by an increase of the monitor factor for all IP7 BLMs:</p> <ul style="list-style-type: none"> • Monitor Factors for IP7 0.6 -> 0.8 • Monitor Factors for IP7-DS 0.333 -> 0.45 (equivalent power loss) <p>This allowed to survive the ramp with 675b then 899b.</p> <p>Recurrent RF issue solved by replacement of a tuner control card on Monday. IP4 SVC tripped on Tuesday and resulted in about 5h stop. ALICE background tests continued on Wednesday. A strong background reduction (around factor 50) was achieved by inserting the knob to compensate the ATLAS crossing angle dispersion of B1. A 1h15min fill with 227b was inserted to validate the change before switching back to 899b. In the same 227b fill the feed-forward of OFB trims to the K-SMOOTH level was successfully tested, resulting in a reduction of orbit spikes by about a factor 2. Further modification on BLM thresholds on Thursday morning allowed to reach 1123b:</p> <ul style="list-style-type: none"> • Monitor Factors for IP7 0.8 -> 1 • Monitor Factors for IP7-DS 0.45 -> 0.5 (equivalent power loss) • BLM response correction increased by 1.5 for MQTL.Q6R7.B1 and Q6L7.B2 <p>Access on Friday, due to LINAC3 being down. In the evening first two fills with 1240 bunches, with peak luminosities around $6 \times 10^{28} \text{ cm}^{-2}\text{s}^{-1}$ The first one was dumped due to losses on the TCLD.R2 exceeding the BLM thresholds, the second was dumped when quench heaters were fired on a dipole in cell 8R2. The heater firing was possibly triggered by a SUE due to the losses on the TCLD. During the quench recovery the cold compressor was lost, leading to cryo condition loss in S12 and S23. Due to the energy</p>		

	<p>saving mode, the recovery was extremely long, recovery still ongoing Sunday evening.</p> <p>In the shadow of the cryogenic recovery accesses for VIP visits in point 1 during the Science Gateway inauguration (visits from 9am to 5pm in UJ13).</p>			
Issues	<p>ALICE backgrounds (solved) Losses in the ramp (mitigated)</p>			
Plans	<p>Physics with 1240b VdM for ALICE</p>			
Intervention Request				
Yes / No	Duration	No	Preferred date/time	

Linac 3			
Machine Supervisor last week	R. Scrivens		
Machine Supervisor this week	R. Wegner		
Statistics			
Availability	90.9%		
Facility Status			
Ion species	Pb		
Summary	Source. Very stable performance. Oven2 ramped up ready for operation on Monday 02/10..		
Issues	<p>Source: Occasional instabilities that last ~5 minutes (<1/day). HV trip on Friday morning (in shadow of RF fault).</p> <p>RF: Cavity 1 amplifier went down at 1:20 on Friday 06/10. Downtime 14 hours. Remote reset was not possible, and on-site a limitation in power from the amplifier was seen. The issue was tracked down to a change in a power threshold setting in an embedded measurement system inside the amplifier. The RF team will investigate if there is an explanation how the setting changed, and why it was not possible to see and diagnose the fault more quickly.</p>		
Plans	<p>Oven refill.</p> <p>Possible stripper foil exchange (~2 minutes).</p> <p>Test with RFQ tuners with beam (Risk to trip RF. To be planned with ion coordination).</p>		
Intervention Request			
Yes / No	Duration	12h	Preferred date/time 6:00 - 12/10/2023
Reason	Source oven refill		
Impact			