21 August 2023

ACCELERATORS & EXPERIMENTAL FACILITIES STATUS

SUMMARY OF WEEK 33 - 2023

Technical infrastructure – *J. Nielsen*

Linac 4 – *A. Lombardi*

PS Booster – *F. Asvesta*

ISOLDE – *E. Fadakis*

PS – *A. Huschauer*

PS – East Area – *N. Charitonidis*

PS – nTOF – *M. Bacak*

AD – ELENA – *B. Dupuy*

SPS – *K. Li*

SPS – North Area – *N. Charitonidis*

SPS – AWAKE – *G. Zevi Della Porta*

SPS – HiRadMat – *Not running, no report*

Linac 3 – *G. Bellodi*

LEIR – *No report*

LHC – *J. Wenninger & M. Solfaroli*

CLEAR – *V. Rieker*

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	Quite a busy week, in particular with several technical issues around LHC5!				
Issues	***Tue 15/08/23 05:20:*** TIM connection problem with database, again quite similar to recent problems. Best effort called and fixed quickly the problem. ***Wed 16/08/23 20:27:*** CMS Coldbox disconnected due to AUG on 3.3KV cryogenics Breaker. AUG on EKD208/5E alarm received. (Extractable Circuit Breaker). EN-EL could not reset or switch back remotely, on-site intervention required with partial ramp down of CMS to lower electrical consumption. ***Wed 16/08/23 21:30:*** Electrical alarm on EXD1502/55 switchboard: Interlock External. This is a switchboard controlled by CMS, the trip caused the CMS magnet to quench. An interlock was sent via DSS system to the ventilation controls, and it put the ventilation in flush mode for "gas detection". The ventilation went back to nominal after a reset by CMS crew on the DSS system. ***Fri 18/08/23 05:30:*** Smoke alarms seen on the extraction for the ventilation in SH5 in LHC5. At the same time alarms seen on the UPS for CRYO in the same place. TI guides FireBrigade towards the UPS, since it's very likely the cause of the smoke. Indeed the FireBrigade confirms a bad smell around the UPS. TI asks FireBrigade to not cut the emergency stop, but to stand by to do so in case the situation evolves, until the EN-EL piquet can come and put the UPS on bypass to not cut CRYO. The intervention went, batteries were replaced, and UPS restarted without problems. Very good coordination between FireBrigade, TI, EN-EL piquet and CRYO let to a successful intervention with no cut of CRYO. It should be noted that the fact that we had fire detection around the UPS allowed for early detection. ***Sun 20/08/23 15:39:*** Cooling tower fault for the cooling circuit "FAIR" in building 279. A phase had a fault on the variable speed controller for the motor. Piquet was contacted for intervention. The stop of the cooling tower caused a stop also of CRYO installations in Meyrin.				
Plans	EN-CV has a problem with a valve in SF2 (LHC2) that requires an intervention. It was agreed in the TIOC to plan this for Monday 21/8. CRYO will have operators available in case of a cut and it's still before restart of the LHC. There should normally not be any impact by this intervention, but the risk is present when opening the electrical cabinets. IMPACT number: 215685				

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

Linac 4					
Machine Coordinator last week	Alessandra Lombardi				
Machine Coordinator this week	Giulia Bellodi				
Statistics					
Availability	99.9%				
Facility Status					
Summary	A very good week. -On Wednesday source test for 1 hour: Change LEBT gas injection pressure to see if for different space charge neutralization degrees the beam pulse flatness after the RFQ improves. It is possible to achieve a flatter pulse at the expense of transmission. Probably room for improvement if solenoids and steerers' values can be scanned as in MD mode. Very useful test to be followed up with studies at the source test stand. -the elevator door was fixed, profiting from the stop for PSB intervention on wednesday				
Issues	-trip of CCDTLon Sunday, -BIC stopping the source on wrong signal from L4L.NFH.014 (old Einzel lens converter, not connected) that auto-calibrated periodically and caused missing communication. Solved on Wednesday by putting the converter into Blocking.				
Plans	Continue operation as usual.				
Intervention Request					
Yes / No	***Duration***		***Preferred date/time***		
Reason					
Impact					

<table>
<tr><th colspan="4">PS Booster</th></tr>
<tr><td colspan="2">Machine Coordinator last week</td><td colspan="2">F. Asvesta</td></tr>
<tr><td colspan="2">Machine Coordinator this week</td><td colspan="2">S. Albright</td></tr>
<tr><td colspan="4">Beam Scheduled</td></tr>
<tr><td>ISOLDE</td><td>Yes</td><td>PS</td><td>Yes</td></tr>
<tr><td colspan="4">Beam Availability by Destination (AFT)</td></tr>
<tr><td>ISOLDE</td><td>92 %</td><td>PS</td><td>89.4 %</td></tr>
<tr><td colspan="4">Facility Status</td></tr>
<tr><td>Summary</td><td colspan="3">

Challenging week requiring two accesses, on Monday for the regular inspection of QFO11 and on Wednesday for the replacement of BI1.BSW1L1.4. Many thanks to everyone involved during the various interventions and stops.
Delivery of operational and MD beams as requested by the users.
Verification of the HiRadMat beams in the PSB.

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<tr><td>Issues</td><td colspan="3">

Planned access on Monday morning for the inspection of QFO11. Situation on the quadrupole remains stable.
In parallel:

Camera installed to monitor the water leak on QFO11.
Inspection of BI.BSW: A water leak was found on the coil of BI1.BSW1L1.4. The experts allowed the restart of the machine, however, requested scheduling a stop for the replacement of the coil as soon as possible. The decision for the access was taken during FOM, considering the concerns of the full complex.

Full access and recovery took about 2h, 1 for the regular inspections and 1 to assess the BI1.BSW1L1.4 situation.
Access on Wednesday morning to replace the leaking coil on BI1.BSW1L1.4. Intervention was successful and the experts identified the leak where they expected. However, when reinstalling the magnet some condensation was observed on ring 3. The reason for this is not yet known but the experts cannot exclude a water leak. As a result, the ABT team will be accessing the machine during the regular inspections for the quadrupoles to follow up the status.
In parallel:

Additional lighting installed to facilitate the remote checks for the water leak on QFO11 as the recording was too dark. Indeed, the situation is much cleaner now and the camera can be used to remotely observe the leak.
Measurements on the machine quadrupoles for other possible water leaks. The magnets team checked thoroughly magnets showing suspicious measurements, and no other leaks were found. Regular inspections will continue as planned.
FGC card replacement on BR2.QCD.1.
RF amplifier replacement for B-train system in ring 4 (not used in operations).
BLM team removed the splitter on the Diamond BLM signals, keeping only the amplified ones for all rings. OP verified the signals with beam.

Activities took overall 10h45min. Vacuum recovered fast in ring 1 and operations in degraded mode were not needed.
During the restart:

The distributor, BI.DIS10, was in fault and could not be reset from the CCC. Both the piquet and the expert were contacted and identified the source of the interlock in the imbalance signals. The thresholds were changed and beam was in the PSB after an additional 1h15. The ABT team is following up the situation to

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<tr><td></td><td colspan="4">identify possible links of the interlock to powering off the system for the access.
○ After about 30min of normal operation, an interlock on the H0H-monitor for R1 occurred. The interlock was present even without beam and the experts were needed onsite. A large offset on the plates signal seems to be the reason for the interlock. The experts exchanged a card, but the problem persisted, while it was resolved once the old card was put back in place. The reason for this offset or how it was resolved is not clear and the experts are closely monitoring the situation. This problem blocked operations for an additional 4h8min.
• 15min downtime for the PS access on Thursday evening.</td></tr>
<tr><td>Plans</td><td colspan="4">Normal operations, providing beam to downstream machines, experiments and MDs</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>
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ISOLDE					
Machine Supervisor last week	Lefteris Fadakis				
Machine Supervisor this week	Simon Mataguez				
Beam Scheduled					
GPS	Yes	***HRS***	No	***HIE-ISO***	No
Beam Availability by Destination (AFT)					
GPS	%97	***HRS***	%	***HIE-ISO***	%
Facility Status					
Summary	Faced issues with the HT at the start of the run but run went smooth once they started.				
Issues	Issues with both HT power supplies. GPS was solved easily but HRS we still need to investigate and decide on course of action. We were not able to put in place the target in HRS due to a fault on the piston of the clamps. Experts made a fast intervention to change the piston and allowed us to carry on.				
Plans	Find a slot to repair the HRS HT. Work on setting up the beam from HRS to the CRIS experiment.				
Intervention Request					
Yes / No	***Duration***		***Preferred date/time***		
Reason					
Impact					

PS

Machine Coordinator last week	Alex Huschauer
Machine Coordinator this week	Alex Lasheen

Beam Scheduled

East Area	Yes	***nTOF***	Yes	***AD***	Yes	***SPS***	Yes

Beam Availability by Destination (AFT)

AD	75.3 %	***EA N***	76.1 %	***EA T8***	76.1 %	***EA T9***	76.1 %
nTOF	73 %	***SPS***	74.2 %				

Facility Status

Summary	• Low intensity TOF cycle at 20E10 ppb sent to TOF Monday-Tuesday night • SFTPRO intensity reduced to ~600E10 ppp on SPS-NA request • Sublimation started every day at 14h in view of ion run • Limits of EAST proton sharing discussed with physics coordinator(s) and at user meeting following frequent requests to increase the intensity per spill or the number of spills • Tests with wire scanner in SS54 performed with expert – can be used during working hours, preference to be given to BWS68 to measure MTE beam • SFTPRO high-intensity tests up to 3300E10 ppp • Hardware checks in preparation of ion run (cavities pulsing and synchronization ok for EARLY and NOMINAL beams)

Issues	• Access Monday morning to repair 20 MHz and 40 MHz amplifiers (40 MHz ok and rephased, work ongoing for 20 MHz)
	• Several interventions profiting from PSB magnet replacement:
	  • Internal dump water flow errors resolved
	  • CPU board for PE.SMH16 replaced to address pulses occurring with setting from a different user
	  • Additional work on 20 MHz cavity in SS92
	• Vacuum leak developed Thursday evening at the downstream flange of SS03:
	  • Aluminum seal showed burnt spot, very likely due to damaged RF bypass caused by SFTPRO high-intensity tests
	  • Almost 17h of downtime for vacuum recovery (many thanks to RP, VSC and RF teams for rapid intervention!)
	  • Second RF bypass in SS02 preventively replaced as well
	  • KFA04 and BFA09 conditioning of ~1h required prior to restart
	• Trips of some 10 MHz cavities Saturday afternoon, access required to replace gap relay of 10 MHz cavity in SS66
	• barrier-bucket failed again on SFTPRO during the night from Saturday to Sunday, local reboot by the piquet required
	• KFA71 module 11 not operational, expert will continue to work on Monday

Plans	

Intervention Request

Yes	***Duration***	1h30	***Preferred date/time***	Early in the week

Reason	- Gap relay of PA.C10.66 needs replacement - Intervention on barrier bucket system to increase reliability
Impact	No beam for users and downstream machines

PS East Area							
Facility Coordinator last week	N. Charitonidis						
Facility Coordinator this week	B. Rae						
Beam Scheduled							
T8	Yes	***T9***	Yes	***T10***	Yes	***T11***	No
Beam Availability by Destination (AFT) General: 83.3%							
Running T8	**83.3%**	***T9***	**83.3%**	***T10***	**83.3%**	***T11***	N/A
Facility Status							
Summary	T09: No issues, smooth operation. T10: Brief issue with magnet T10.BHZ017, fixed with reset. Smooth operation. T11: No user.						
Plans	• T9: ENUBET, EP3DET continue. • T10: ALICE ITS3 -> EIC dRICH (Tuesday 22-08-2023)						
Intervention Request							
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	Progressing with physics programme according to planning.			
Issues	No issues on experiment side			
Plans	• EAR1: 243Am(n,f) out; PPAC particle identification test • EAR1-NEL: R2E – SEL with high energy neutrons & TOF • EAR2: 26Al(n,p) and (n,a) • NEAR: preparation of next irrad. campaign			
Foreseen Beam Stop				
Yes	***Duration***	6h	***Date/Time***	WED 23.08.23; 10h00

AD - ELENA				
Machine Supervisor last week	Bruno DUPUY			
Machine Supervisor this week	Sergio PASINELLI			
Beam Scheduled				
AD	Yes		***ELENA***	Yes
Availability (AFT)				
AD	97.2%		***ELENA***	97.2%
Facility Status				
Summary	AD and ELENA are in nominal operation mode. However, the yield of the antiprotons is strongly impacted (around 10%) by the proton beam position on the AD TARGET (angle and position). Yan Dutheil installed a stabilizer, and started measures to find the causes of this fluctuation in the FTA and DI lines.			
Issues	—Few trip of the DR.QUAD power supply. Sometime recovery by remote reset or needed local first line intervention. —Power supply issues on the AD electron cooler solenoid, outside of regular work, fixed by the first line. —Focalization Horn was down by safety interlocks Friday at 2 a.m. (no "standby service" for this device). To avoid wasting more time, the supervisor has come for a local RESET. Wednesday, the AD C10 cavity tube amplifier has been changed to prevent future failures.			
Plans	Operation as usual			
Intervention Request				
Yes / No	***Duration***		***Preferred date/time***	
Reason				
Impact				

SPS

Machine Coordinator last week	Kevin Li
Machine Coordinator this week	Carlo Zannini

Beam Scheduled

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

Beam Availability by Destination (AFT)

LHC	-	***NA***	70%	***AWAKE***	-	***HiRadMat***	-

Facility Status

Summary	A relatively poor week for the SPS, especially given that we should be running in a quiet and stable period – overall availability only a lean 70%. The original plan was NA production physics and three days of LIU beam development and commissioning on Wednesday, Thursday and Friday. The Wednesday MD had to be cancelled to allow for a 24 h intervention on one of the Booster magnets of Ring 1. This led to a 12 h downtime for NA physics beams. Beam was re-established Thursday morning, and the LIU MDs could then take place as scheduled. The MD was cumbersome, due to initially poor beam quality from the PS (longitudinal splitting and coupled bunch instabilities) but also due to the SPS 800 MHz cavities running very unreliably with many faults and trips. The RF team has been investigating all day long and has added additional diagnostics to help understand the problem, which is currently not yet identified. The MD was stopped due to a vacuum interlock on some kickers when bunch lengths got comparatively short at high intensities close to flat top. When recovering from the LIU MD on Thursday evening it turned out, that the PS had experienced a vacuum leak in an RF bypass, which consequentially had to be exchanged. The intervention plus subsequent pumping took the machine down for another 17 h. Followed by some problems in the SPS with SBDS electronics, beam was back only after noon. LIU studies continued then, and eventually reached back the 2.2e11 ppb at 1.6 ns at flat top. The refurbished wirescanners have held up so far withstanding beams reaching up to 2.3e11 ppb at bunch lengths of around 1.6 ns. The mitigations methods to suppress excessive wire heating with high intensity beams seem to be working so far. NA beams could be delivered reliably most of the time whenever there was beam. On the weekend, an RF cavity problem in the PS inhibited barrier buckets to be sent to the SPS which lead to the third longer downtime of the weeks of 4 h. Other than that, beams were sent reliably and of usually good quality with empty bucket channelling now running routinely in conjunction with the ABO noise suppression.
Issues	• 800 MHz cavities running erroneously – diagnostics box connected with fault analysis to be done. • SBDS fan cooling threshold needs to be reverted back to 400 degrees.
Plans	• HiRadMat beams next week • Dedicated MD on Wednesday • HW commissioning for ions from Thursday

Intervention Request

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

SPS North Area							
Facility Coordinator last week	N. Charitonidis						
Facility Coordinator this week	B. Rae						
Beam Scheduled							
H2	Yes	***H6***	Yes	***K12***	Yes	***P42***	Yes
H4	Yes	***H8***	Yes	***M2***	No	***TT20***	Yes
Beam Availability by Destination (AFT) General: 71.7%							
H2	71.7%	***H6***	71.7%	***K12***	71.7%	***P42***	71.7%
H4	71.7%	***H8***	71.7%	***M2***	71.7%	***TT20***	71.7%

Facility Status	
Summary	**H2**: NA61 data finished. **H4**: Normal operation. No issues **H6**: Normal operation. Negative beam given T4 wobbling change. **H8**: Observed again electrons at -288 GeV/c during wobbling change. No issues, good operation. **M2**: No user. **P42/K12**: Good beam operation. Running at lower intensity of 22 units on T10 on request of NA62. **Sharing**: From Wednesday on, we would like to request 50 (T2) - 37 (T4) - 50 (T6) as NA62 runs at 22 units at T10 and MUonE is starting in the M2 beamline. For T4, the intensity can be adjusted to match the 22 units on T10, which is transparent for the H6 and H8 users.
Issues	**H2:** Moving beam issue still present due to magnet / power converter problems that need to be identified, SY/EPC following. **P42/K12:** Some few times magnet currents ran out of reference for a spill, which triggered P0survey to close the P42 TAX (few minutes downtime).
Plans	• H2: HIKE SAC → LHCb ECAL • H4: FASER NU → RD51/GIF++ • H6: ATLAS ITK PIXEL → MONOLITH, EP PIXEL • H8: AMS L0, PAN, SND/LHCb → LHCb, SELDOM (TWOCRYST), SND/LHCb • M2: No user → MuonE

Intervention Requests				
Yes	***Duration***	2hrs	***Preferred date/time***	Monday 21st morning or afternoon (TBC)

SPS AWAKE				
Facility Coordinator last week	Giovanni Zevi Della Porta			
Facility Coordinator this week	-			
Facility Status				
Summary	Limited access in TAG41 due to GSM cable installation. Small interventions			
Issues				
Plans	Vapor source tests with laser for diagnostics calibration. Prepare for protons starting on 26 August (or 28 August, depending on HiRadMat)			
Foreseen beam stop				
Yes / No	***Duration***		***date/time***	

LHC				
Machine Coordinator last week	J. Wenninger & M. Solfaroli			
Machine Coordinator this week	J. Wenninger & M. Solfaroli			
Statistics				
Availability	NA		***Stable Beam Ratio***	NA
Facility Status				
Summary	At the beginning of the week, cryo started filling the arc magnets with liquid Helium. By the end of the week, all sectors filled and at 2K, last adjustments in the arc for S78. LSS8L and ITL8 ready.			
Issues				
Plans	Cryo ready for powering. ELQA of ITL8 and main arc circuits. Start of powering tests. Machine closed end of the week.			
Intervention Request				
Yes / No	***Duration***		***Preferred date/time***	

Linac 3				
Machine Supervisor last week	G. Bellodi			
Machine Supervisor this week	D, Küchler			
Statistics				
Availability	NA			
Facility Status				
Ion species	lead			
Summary	- LBS measurements and debuncher setup on Monday. - Final beam characterization with reference beam profile measurements taken on Tuesday - Ramping cavity scan and beam energy measurements repeated on Wednesday after RF phases were accidentally lost the day before. - Beam delivered to LEIR on Wednesday as scheduled. - ~35uA delivered on average on ITL.BCT25 since			
Issues	- Observed a ~kHz oscillation on shot-to-shot ITL.BCT05 without beam. BI following up. - Buncher and ramping cavity phase settings lost after RF restart			
Plans	Normal operation and beam delivery to LEIR			
Intervention Request				
Yes / No	***Duration***		***Preferred date/time***	
Reason				
Impact				

CLEAR	
Facility Coordinator last week	Vilde Rieker
Facility Coordinator this week	Wilfrid Farabolini
Facility Status	
Summary	• 3rd (and last) week of the summer-shutdown • Main tasks related to the re-commissioning of the plasma lens, which involved vacuum intervention. • Succesful test of the plasma-lens (without beam). • Identified locations for future BBP experiment and installed fibers. • Attempt to re-start klystrons and magnets for a quick test towards the end of the week failed as is was not possible to get the necessary permissions in time.
Issues	RF interlock on klystrons and main switch for magnet power converters consigned.
Plans	Re-start of CLEAR and run the planned plasma lens experiments.