

25 September 2023

ACCELERATORS & EXPERIMENTAL FACILITIES STATUS

SUMMARY OF WEEK 37 - 2023

Technical infrastructure – *J. Nielsen*

Linac 4 – *A. Lombardi*

PS Booster – *F. Roncarolo*

ISOLDE – *E. Fadakis*

PS – *R. Garcia Alia*

PS – East Area – *M. van Dijk*

PS – nTOF – *N. Patronis*

AD – ELENA – *L. Joergensen*

SPS – *G. Papotti*

SPS – North Area – *M. van Dijk*

SPS – AWAKE – *G. Zevi Dellea Porte*

SPS – HiRadMat – *Not running, no report*

Linac 3 – *R. Scrivens*

LEIR – *C. Carli*

LHC – *D. Nisbet*

CLEAR – *P. Korysko*

Technical Infrastructure (TI)

Facility Coordinator last week

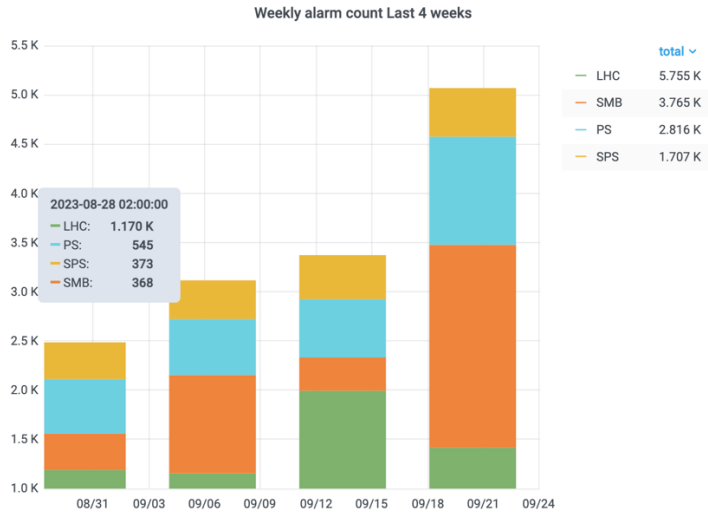
Jesper Nielsen

Facility Coordinator this week

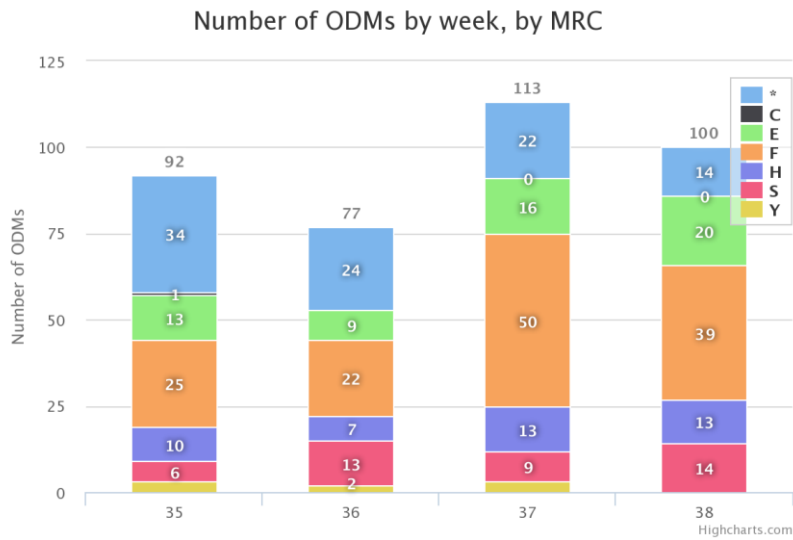
Jesper Nielsen

Statistics

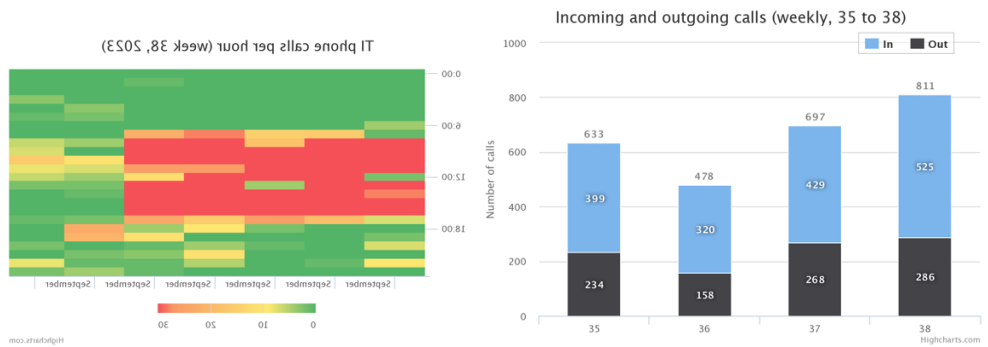
Alarms



ODMs



Phone Calls



Facility Status

Summary

Quite a busy week in TI, fair amount of events, both with and without impact on physics.

Mon 18/09/23 22:38: Electrical disturbance on the 400kV line Genissiat - Vielmoulin 3, caused by a lightning strike. -14.1% voltage dip measured at CERN for 80ms.

Tue 19/09/23 10:01: 18kV breaker failure causes electrical perturbation on CERN network. The breaker feeds LEIR power converters. External company was contacted by EN-EL rapidly, to redo the end of the cables. After this intervention it was possible to reroute the cables to a spare breaker that allowed to repower LEIR the morning after.

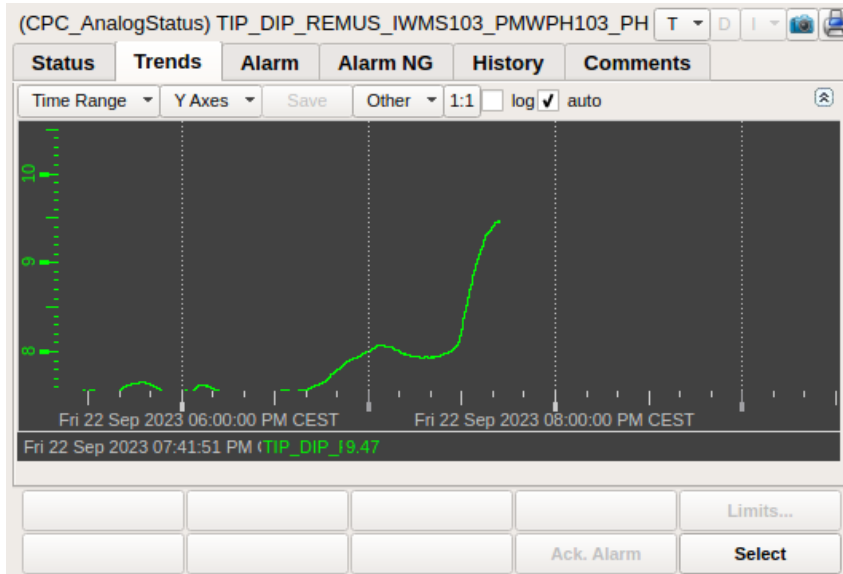


Issues

Wed 20/09/23 12:28: During an intervention of SIG, the pressure of the primary water inlet to CERN dropped and caused alarms on the SVCs. SIG was quickly informed, the pressure drop was fortunately not below the trip thresholds.

Fri 22/09/23 17:08: Water present in TCC8, initially the plan was to pump out the water in the shadow of another intervention. However, the infiltration of water was also in access rack. The rack was repaired, but during the repair the patrol signal was lost. No beam in the area possible during the repair.

Fri 22/09/23 19:11: High pH alarm, in reject water station near SMI2 building. The reason is not yet clear, is being looked into by the fire brigade.



Sun 24/09/23 11:55: CRYO trip of sector 3-4, caused dump of beam LHC.

A communication alarm was present in the controls system: Communication CFP_SH4_QSCA -> DS driver 6

The BE-ICS piquet was called, and after picking up materials for the repair at Preveessin, the PLC was repaired.

Mon 25/09/23 04:05: CO2 problem in EHN2. Amber Control Room inform TI of a CO2 problem that block them from doing physics. TI has no piquet for this kind of problem, and after trying multiple best efforts it was decided to wait for the morning.

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

Linac 4			
Machine Coordinator last week		Alessandra Lombardi	
Machine Coordinator this week		Luca Timeo	
Statistics			
Availability	98.5%		
Facility Status			
Summary	A good week, with the exception of the consequences of the power glitch on Tuesday		
Issues	Following the power on Tuesday morning a: 24V/2A power supply of the Source cage interlocks was replaced: it had a burnt-out electrolytic capacitor.		
Plans			
Intervention Request			
Yes / No	Duration		Preferred date/time
Reason			
Impact			

PS Booster			
Machine Coordinator last week		F.Roncarolo	
Machine Coordinator this week		G.P. Di Giovanni	
Beam Scheduled			
ISOLDE	Yes	PS	Yes
Beam Availability by Destination (AFT)			
ISOLDE	96 %	PS	96%
Facility Status			
Summary	<ul style="list-style-type: none"> • Beam delivered as planned for operation and MDs, • Water leaks stable. • Works outside Bld.361 completed <ul style="list-style-type: none"> ○ no more water infiltrations into technical room ○ new road pavement, new PSB logo on bld 361 facade ! 		
Issues	<ul style="list-style-type: none"> • Tue 19th: <ul style="list-style-type: none"> ○ electrical glitch, ABT piquet and first line for BI.BSW/BI.SMV and BTY.QFO304 (in shadow of L4 restart) ○ BT2.BTV20 in fault, first line called (1h16m downtime) • Wed 20th <ul style="list-style-type: none"> ○ Several Bir.KSW and Ber.KFA trips and reset/reboot (~30min total downtime) • Thu 21st <ul style="list-style-type: none"> ○ POPS-B interlock due to OVER_TEMPERATURE seen by known issue of the BR1.BHZ31 (20min downtime) • Fri 22nd <ul style="list-style-type: none"> ○ Several trips of BE.BSW15L4, ABT piquet on site, problem disappeared without fully understanding problem (~1h40m cumulated downtime during afternoon-evening) 		
Plans	<ul style="list-style-type: none"> • Routine operation and MDs 		
Intervention Request			
Yes	Duration	1h	Preferred date/time Thursday 28th September, 7:30 a.m.
Reason	'Routine access' for water leaks visual inspections		
Impact	1h downtime		

ISOLDE					
Machine Supervisor last week		Lefteris Fadakis			
Machine Supervisor this week		Emiliano Piselli			
Beam Scheduled					
GPS	Yes	HRS	Yes	HIE-ISO	Yes
Beam Availability by Destination (AFT)					
GPS	%94.3	HRS	%85.3	HIE-ISO	%85.3
Facility Status					
Summary	<p>The week started with the power cut. The whole facility recovered fast apart from the REX-HIE cryoplant, used for the SRF cavities of our LINAC. It took almost one day for it to recover. Even though the experts were on site working on it within the same hour from the power cut. Many thanks to everyone involved in bringing back LHe into our cryomodules and avoiding a quench. Run started a day late but will run an extra day.</p> <p>On GPS users are performing implantations on GLM with only two target heating trips.</p>				
Issues	<p>Power cut brought down the cryoplant. Some cryomodules lost almost all LHe. Luckily experts brought it back and avoided a quench</p>				
Plans	<p>Miniball continues to take beam from HRS until Tuesday morning. GPS users stop today and a new target will go in GPS.</p>				
Intervention Request					
Yes / No	Duration		Preferred date/time		
Reason					
Impact					

PS							
Machine Coordinator last week		Ruben Garcia Alia					
Machine Coordinator this week		Matthew Fraser					
Beam Scheduled							
East Area	Yes	nTOF	Yes	AD	Yes	SPS	Yes
Beam Availability by Destination (AFT)							
AD	95.8%	EA N	92.1%	EA T8	95.8%	EA T9	95.8%
nTOF	95.8%	SPS	95.8%				
Facility Status							
Summary	<ul style="list-style-type: none"> - Difficult recovery from generalized power cut on Tue morning (see issues below) - Despite the cut, good overall availability (though some beams – MTE, nTOF – had several hour periods with somewhat degraded conditions) - Short-term schedule changes, mainly due to LEIR downtime on Tue and Wed (also linked to power cut) 						
Issues	<p>Mainly linked to rough comeback from power cut:</p> <ul style="list-style-type: none"> - Lower EAST_N availability due to FGC setting issue after cut, which was difficult to spot; - Several hours of degraded MTE due to too large core intensity (large losses in transfer line, etc.); - Extraction issues for LHCINDIV, solved with KFA71 timings, RPOS synchro and further PSB blowup; <p>Several issues with 80 MHz cavities:</p> <ul style="list-style-type: none"> - Hardly affecting availability, but close to doing so; - Requiring various RF piquet interventions; - Amplifier change from C80-89 (protons) to C80-08 (ions); - LHC proton beams had to be produced with only one 80 MHz cavity (as opposed to two) – still OK in terms of bunch length; <p>Wed evening/night: no parasitic to TOF due to SEM grid configuration issue</p>						
Plans	<ul style="list-style-type: none"> - Check TOF/EAST distribution in light of SPS ion train filling, leaving only one basic period in between, and hence only being able to accommodate TOF cycles 						
Intervention Request							
Yes	Duration		Preferred date/time				
Reason	Check TT2 stripping foil						
Impact							

PS East Area							
<i>Facility Coordinator last week</i>		M. Van Dijk					
<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>	91.9%	<i>T9</i>	91.9%	<i>T10</i>	91.9%	<i>T11</i>	91.9%
Facility Status							
<i>Summary</i>	Overall: Leaks in roof have been addressed, only some small drips remaining. T9: Good operation. T10: Operation OK from beam side. T11: Beam ready.						
<i>Issues</i>	T9: Issue with all T9 XBPFs, duration Wednesday morning. T10: Low-pressure XCET finally switched to CO2 because with helium the detector was not sufficiently effective. Some downtime on the high pressure XCET due to a power glitch on Tuesday morning						
<i>Plans</i>	T9: ALICE PHOS continues. T10: BL4S → ALICE ITS3 T11: CLOUD continues.						
Intervention Request							
Yes / No	<i>Duration</i>			<i>Preferred date/time</i>			
<i>Reason</i>							
<i>Impact</i>							

PS nTOF			
Facility Coordinator last week		Nikolas Patronis	
Facility Coordinator this week		Nikolas Patronis	
Beam Requested			
Yes			
Facility Status			
Summary		Physics programme according to schedule	
Issues		No issues	
Plans		<ul style="list-style-type: none"> • EAR1: The first transmission measurement is in data taking mode. For the past and the following week transmission measurements using the existing beam filters are performed on different isotopes. Preliminary results are promising following our expectations. • EAR2: $^{26}\text{Al}(n,p/a)$ measurement in data taking for one more week. • NEAR: no interventions for this week 	
Foreseen Beam Stop			
No	Duration		Date/Time

AD - ELENA			
Machine Supervisor last week		Lars Varming Joergensen	
Machine Supervisor this week		Bertrand LEFORT	
Beam Scheduled			
AD	Yes	ELENA	Yes
Availability (AFT)			
AD	87%	ELENA	87%
Facility Status			
Summary	<p>Not a bad week but it was complicated to get back to full intensity after the power glitch. As it is often the case at ED/ELENA, after a glitch something stays magnetised in the AD, probably in the E-cooler area, and the machine orbit is very different but slowly drifting back to the nominal orbit. Making operation delicate.</p> <p>Good news is that we are now working at even higher intensity: PS dream Team is now providing us 2000E10 protons on the target allowing ELENA to serve more than 8E6 very low energy Pbars to each User !</p> <p>The bad news is that the AD ejected intensity is fluctuating and so far we have no idea about what could be the cause !</p>		
Issues	<ul style="list-style-type: none"> - One of the ELENA E-Cooler power supply was no longer following the function and producing electron constantly, creating a vacuum degradation by 3 orders of magnitudes. Easily spotted and fixed by The 2 Alexandre (Sinturel / Frassier) - The AD magnetic quads are still failing several times per day. Requiring up to 10 cycles to restart. - Trip of the horn and no ABT piquet for AD. So, we either go on site to push a physical buttons or we wake-up best effort people that can do it remotely. 		
Plans	To solve the intensity instability at the end of the AD cycles !		
Intervention Request			
Yes / No	Duration		Preferred date/time
Reason			
Impact			

SPS							
Machine Coordinator last week		Giulia Papotti					
Machine Coordinator this week		Michael Schenk					
Beam Scheduled							
LHC	Yes	NA	Yes	AWAKE	No	HiRadMat	No
Beam Availability by Destination (AFT)							
LHC	96.1%	NA	91.1%***	AWAKE	-	HiRadMat	-
Facility Status							
Summary	<p>Another dynamic week for the SPS. The absence of ion beams Tuesday-Thursday was managed by rescheduling the activities (did Thursday on Wednesday, Friday on Thursday, Wednesday on Friday): i.e. the long parallel MD was taken on Wednesday in parallel to NA physics, Thursday had NA production and ion commissioning (LHC and SFT), Friday was dedicated to the 14 inj cycle (no NA physics). NA physics served with 100 units on T6, 9-18 on Tuesday (50 units otherwise). On the commissioning progress:</p> <ul style="list-style-type: none"> - finished setting up of LHCION4 (3 injections, extracted). - prepared 7 inj without slip stacking (100ns spacing, LHCION1). - positive progress on 14 inj with slip stacking, to be continued. - worked on ions fixed target cycle (SFTION4, to be finished). - transverse damper setup on all ion cycles. - end-of-year V aperture measurements performed. <p>MDs:</p> <ul style="list-style-type: none"> - parallel MD on PS2SPS transfer of high intensity LHC beams - high intensity beam at injection for transverse stability studies (target 2.6e11ppb). 						
Issues	<p>Monday: beam quality from PS (octupole – solved) Tuesday: CERN-wide electrical perturbation (short effect on SPS per se), no protons for a few hours, and no ions until Thu (solved) Wednesday-Thu: many trips of 80MHz PS cavity, impairing availability of ion beams and pLHC beam for MDs. Friday: patrol loss in TCC8 (solved). Friday: water leaks in BA5. Ongoing: ventilation issues in BA2, need RP when access.</p>						
Plans	<p>Monday 8-20: 14 inj slip stacking setup. Tuesday: short parallel MDs. Thursday: end of pFT to NA, DSO tests, start of iFT to NA. Friday: rad survey.</p>						
Intervention Request							
Yes / No	Duration			Preferred date/time			
Reason							
Impact							

*** I have a doubt on the definition of the “fault” that was instead the scheduled MD, this could gain the NA availability about 5% extra (85% to 90%). To be followed up at AFT meeting on Monday 24.09.

SPS North Area							
Facility Coordinator last week		M. Van Dijk					
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)							
H2	85.8%	H6	85.8%	K12	79.9%	P42	85.8%
H4	85.8%	H8	85.8%	M2	85.8%	TT20	85.8%
Facility Status							
Summary	<p>H2: Smooth operation. Preparations for the ion beam ongoing. Moving beam test done 21/09, results being processed and to be presented in the next EATM.</p> <p>H4: Smooth operation. Preparation for the ion beam ongoing.</p> <p>H6: Smooth operation.</p> <p>H8: Smooth operation, good coordination between users. Preparations for ion beams ongoing.</p> <p>M2: Successful high intensity hadron test done on Tuesday. Hydrogen operation of AMBER ongoing since Monday.</p> <p>P42/K12: Smooth operation.</p>						
Issues	<p>H8: Downstream users reported large beam size, finally attributed to H8A users moving thick borosilicate lens into the beam. Observed also moving beam issue (spill to spill, not the same as the H2 issue) on Wednesday evening.</p>						
Plans	<p>H2: NA61 continues with ions.</p> <p>H4: CMS HGCAL → Ion commissioning, PAN</p> <p>H6: ATLAS ITK Pixel, ALTA BCM Prime, CMS MTD, ATLAS AFP TOF → End of run on Thursday morning 28/09.</p> <p>H8: STI, LHCb RICH + SciFi, CMS MTD, Straw Tracker R&D, CMS RPC → Ion commissioning, VLAST.</p> <p>M2: AMBER + MUonE end of run on Thursday morning 28/09.</p> <p>P42/K12: NA62 end of run on Thursday morning 28/09.</p>						
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	<p>Week mainly dedicated to electron beam commissioning:</p> <ul style="list-style-type: none"> • Commissioned new optics for focus in plasma cell • Orthogonal steering with new corrector • Measurements of Earth's B field effect on trajectory <p>Other activities: CV in TCV4 for pipe measurements, GSM connectors in TSG41/TSG4, cleaning of TAG41 and control room</p>		
Issues	<ul style="list-style-type: none"> • Access system: could not enter beam mode but didn't know why. Tracked down to an open door (TCV4) which does not show up in TIM viewer • Patrol lost twice (1 emergency handle pulled, 1 issue with PAD). Thanks for prompt help from SPS to re-establish it. 		
Plans	2 weeks to go before proton run. Contractor visits for plasma source (this week) and laser (next week).		
Foreseen beam stop			
Yes / No	Duration		date/time

LHC			
Machine Coordinator last week		David Nisbet	
Machine Coordinator this week		Enrico Bravin	
Statistics			
Availability	78.8%	Stable Beam Ratio	11.9%
Facility Status			
Summary	<p>The week began with 3 high-beta physics fills prematurely ended by electrical network perturbations, including the last fill of the program.</p> <p>One of the perturbations was an effect of a failed 18kV switch in the LEIR complex; the failure caused ions to be not available for >48hrs just as ion commissioning was starting in the LHC.</p> <p>While waiting for ions</p> <ol style="list-style-type: none"> 1. switched to a single pprof fill on Tuesday night. 2. brought forward the economy reconfiguration of the cryo plant and the refill of the LINAC3 Pb oven. 3. Shortened the MKI pulse and adjusted the AGK settings accordingly with proton pilots 4. Performed an MD at injection with proton pilots <p>Ions captured and preliminary setup on Thursday afternoon. Very efficient thanks to earlier preparation work.</p> <p>The change in the LHC program due to the initial unavailability of ions has also affected the SPS, which is attempting to complete the commissioning of the slip-stacked 50ns beams in time for the start of the intensity ramp up. As initially the ramp up required trains and may have started during the weekend, the LHC has prepared a 100ns beam filling scheme contingency for the initial ramp-up. This beam has also been setup at extraction in the SPS. A close coordination of the machine activities has been necessary.</p> <p>Commissioning of the ion cycle in the LHC has been more complex than expected and therefore taken more time than planned. Several unexpected issues encountered and solved when aligning the crystal collimation scheme. The preparation of a valid collimation scheme is tentatively complete, but requires verification of reproducibility, and validation with loss maps.</p> <p>The commissioning of the ion beams has been interrupted on Sunday morning by a CRYO PLC Fault in P4. Recovery of cryo conditions still ongoing on Sunday night. Unfortunately the perturbation to the RF superconducting cavities and coupler means a short RF conditioning is required.</p> <p>Availability in reality much less than the advertised figure due to the lack of ion beams for >48hrs (mitigated by alternative activities with protons).</p>		
	Issues	<ul style="list-style-type: none"> • RSF2.A67B2 circuit with an earth fault. Disappeared during intervention to identify fault location. Also on same circuit the EE switch causing spurious faults. (Intervention made by MPE on Wednesday) • Wire scanners need multiple a FESA init to recover after each scan. Intervention on Wednesday to inspect, and software update applied Friday (by SY-BI, Tested). • RF reconditioning following cryo stop on Sunday morning. The RF team will start during working hours on Monday morning, and we expect the RF to be ready for beam again on Monday afternoon. 	

Plans	<ul style="list-style-type: none"> • Recover RF system on Monday afternoon. Access in the shadow on Monday morning. • Complete the collimation setup for Pb ions; Inject first ion trains to LHC; • Declaration of first stable beams and start of Pb ion intensity ramp-up • VIP visit on Friday @13:00 requires an LHC beam stop from 09:30. 		
Intervention Request			
Yes	Duration	4 – 6 hrs	Preferred date/time Monday 25/09

Linac 3			
Machine Supervisor last week		R. Scrivens	
Machine Supervisor this week		D. Kuchler	
Statistics			
Availability	90.8%		
Facility Status			
Ion species	Pb		
Summary	<p>Tuesday – Around 10:01 the source, RF and several other equipment tripped off with the main perturbation. During restart the demeralized water was probably too warm and several equipment kept tripping. However, at 10:54 the water station stopped linked to the transformer fault. Green light for restart given at 12:30. Cavity1 RF systems required expert intervention to switch back on, and at 14:47 the beam was back.</p> <p>Wednesday – Oven refill was scheduled as LEIR still recovering, and began at 6:00. A good intensity already available at 14:30. The second oven did have enough Pb inside and would probably have made it to this Friday.</p> <p>Thursday – Source and LEBT tuning after the oven refill. Increase it the threshold current for HV discharge detection reduced the number of sparks.</p> <p>Friday – About 1% of pulse are much lower intensity from the source, no small adjustment could mitigate this, so left in this condition for the weekend.</p> <p>Weekend – Apart from the 1% bad pulses, the weekend was calm.</p>		
Issues			
Plans	Possible source returning needed to reduce drop-outs. Oven refill will need to be scheduled around 18 October		
Intervention Request			
Yes / No	Duration		Preferred date/time
Reason			
Impact			

LEIR			
Machine Supervisor last week	Christian Carli		
Machine Supervisor this week	Reyes Alemany Fernandez		
Statistics			
Availability			
Facility Status			
Ion species	Pb ⁵⁴⁺		
Summary			
Issues	<p>Broken 18 kV transformer (cause for CERN wide power glitch) on Tuesday morning. Intervention until Wednesday late morning to power main and some more power converters operational again. Specialist interventions for some converters in transfer line followed by careful retuning of the machine on Wednesday evening and Thursday.</p> <p>Smooth running once operational again for both EARLY and NOMINAL beams with some performance degradation over the week-end.</p>		
Plans			
Intervention Request			
Yes / No	Duration		Preferred date/time
Reason			
Impact			

CLEAR

Facility Coordinator last week Pierre Korysko

Facility Coordinator this week Pierre Korysko

Facility Status

Summary	<p>Last week was dedicated to three items:</p> <ul style="list-style-type: none">- Beam Loss Monitor studies using an Optical Fiber and two Silicon PhotoMultipliers (with CERN-BI).- CLEAR Machine Development.- Installation of 3+1 15 GHz CLIC Cavity-BPMs (with RHUL and CERN).
Issues	<ul style="list-style-type: none">- CERN Power Cut leading to:<ul style="list-style-type: none">◦ Most pumps OFF◦ All valves closed◦ Laser system OFF◦ Cooling Water Station OFF◦ Klystrons tripped and OFF◦ Most Front-Ends OFF- It took only 1h49 to restart everything and recover the beam after the cut.
Plans	<p>This week is dedicated to two items:</p> <ul style="list-style-type: none">- CLIC Cavity-BPMs studies (with RHUL and CERN).- CLEAR Machine Development.