

# LEIR Hardware Commissioning Tests



Date 08/12/20

# LEIR Transfer Lines HWC

- Brand new HWC checklists for Run3
  - HWC for Transfer line beam checks
  - HWC LEIR

LEIR	
▶	Beam Commissioning Run 3
▶	IST
▶	Beam Commissioning Run 2
▶	Hardware Commissioning...
▼	Hardware Commissioning...
▶	<u>hwc 2020 linac beam t...</u>
▶	<u>pre-requisites</u>
	<u>timing</u>
	<u>vacuum</u>
	safety devices
	collimator
▶	<u>beam instrumentation</u>
▶	<u>magnets</u>
	transverse damper
▶	electron cooling
	rf
	Schottky

# LEIR Transfer Lines HWC

- Transfer line HWC includes some tests and setup necessary for LINAC3 Beam tests.
- As many tests should be done prior to the PS Switch yard closure as possible in case of the need to re-enter to make checks/modifications.

# LEIR Transfer Lines HWC – Prerequisites

- Access System and DSO tests 27-29 May.
- CV restarted water 28 May – required for DSO tests.
- Controls and Databases available before IST period

# LEIR Transfer Lines HWC - Stoppers

- Pre-DSO remote tests were done by EN-SMM 16 April.
- Maintenance was originally scheduled prior to the original IST period (same week as start of CERN COVID stage 3 response).
- Stopper response tested with Access and DSO checks

# LEIR Transfer Lines HWC - Magnets

- OP Polarity Checks were to take place with TE-MS C during IST period.
- HWC checks to take place during times with few people in LEIR/LINAC area of PS SWYD
- Heat run to be made over a weekend when no-one would be in area

# LEIR Transfer Lines HWC - Magnets

Initial Polarity checks by TE-MS-C: hampered slightly by COVID restrictions.

08 July: TE-MS-C checks provide a number of issues with either magnets not being powered or wrong polarities.

# LEIR Transfer Lines HWC - Magnets

14 July: Initial OP Polarity checks showed different results to those taken by TE-MSC.

We found a few issues with our testing procedure.

28 Aug: Following revision of OP polarity check strategy:  
New Procedure and check cycle created.

Number of issues with Power Convertors in morning  
Afternoon checks Ok - “known issue” with ITH.QFN11S/13  
and ITH.QFN21S/23 which appear be inverted wrt. all other  
Quadrupoles.



# LEIR Transfer Lines HWC - Magnets

During set up and checks we confirmed that the magnet controls were working correctly.

Following OP tests, verification of oasis signals and LSA signals.

TO DO: Request NXCALS integration.

# LEIR Transfer Lines HWC – Vacuum

- Tests of all vacuum valves in the transfer lines up to the ring
  - In/out
  - Control from PVSS application
  - Control from Sequencer
  - Correct and stable pressure (PVSS)

	in/out	pvss control	sequencer control	pressure ok
ite.vgp10				
ith.vvs20				
etl.vvs10				
ei.vvs10-s1.vvs1				

**✓ PASSED**

# LEIR Transfer Lines HWC – Timing

- Verification of the timings for the injection lines.
- A Timing Test sequence was created in 2018 to verify all of the timings.
- Need to run Injection Timing sequence only.

# LEIR Transfer Line HWC – Instrumentation (1)

BCT: OK



Beam Screens: OK

BTV: Local Control OK during IST

Server/FESA and Software updates with BE-BI

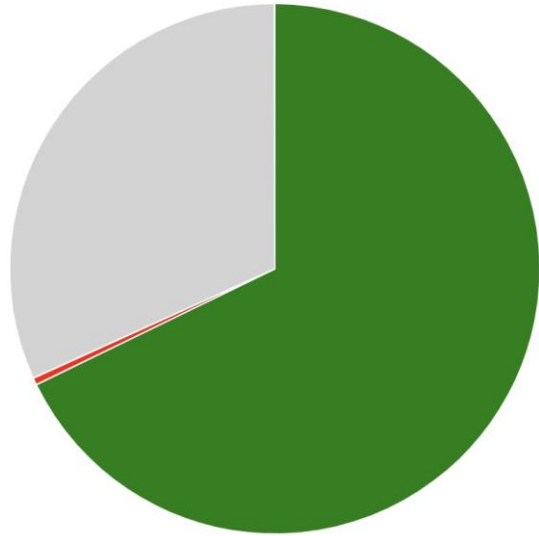
# LEIR Transfer Line HWC - Instrumentation (2)

- LEIR Extraction BPM tests were proposed to take place September 2020 (original planning)

	 oasis	 YASP Calibration & Offset
ite.bpml10		
ite.bpml40		
etl.bpml20		
etl.bpml30		
etl.bpml40		
etl.bpml50		
etl.bpml60		
etl.bpme00		
etl.bpme20		
etl.bpme40		
etl.bpme60		

- We need to fix a date in 2021

# LEIR Transfer Line HWC



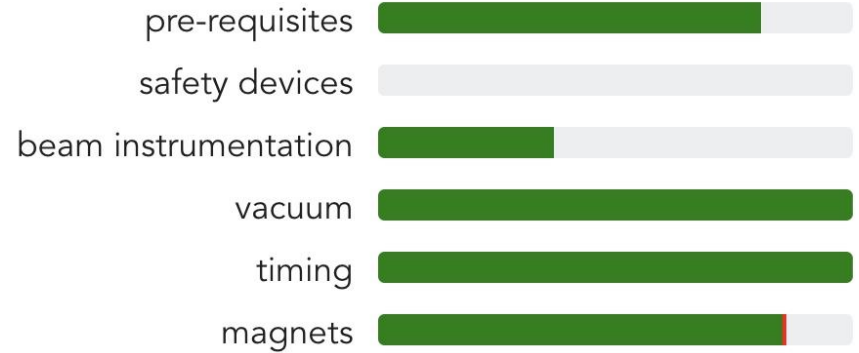
Highcharts.com

316  
PASSED

2  
FAILED

148  
TODO

## Children Nodes



# LEIR Transfer Lines HWC – Part 2

- Prior to the scheduled beam checks with LINAC3 (March 2021):
  - DSO “special beam permit” (To be programmed 2021)
  - BE-ICS-AC to take ETL.STP10 and ETL.BHN10 out of chain
  - ETL.STP20 and ETL.BHN20 to be consigned in safe position (IN/OFF)
  - RP Monitor to be reinstalled and verified
  - Some HWC Tests should be rechecked following upgrades/changes.

