

# Vacuum system

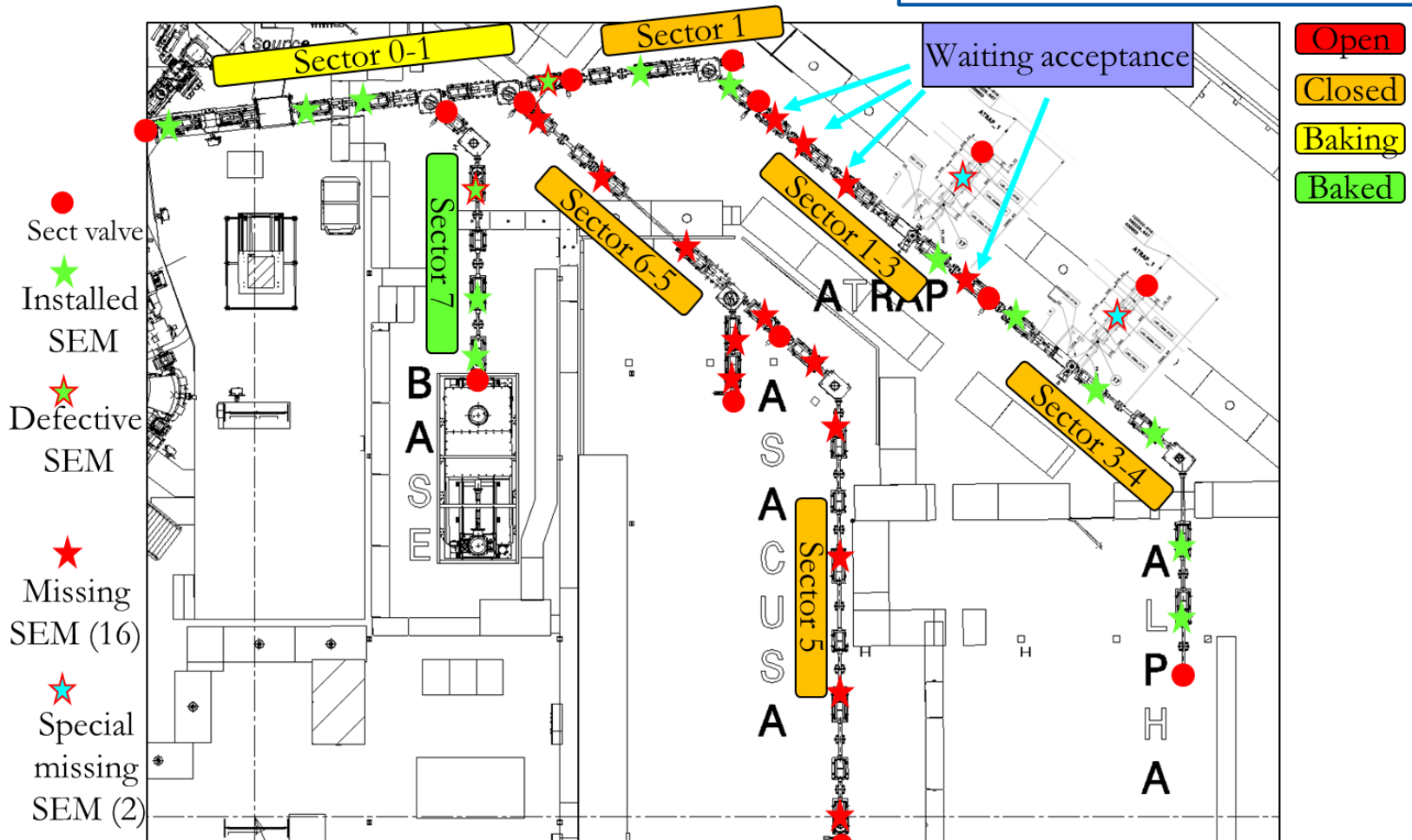
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# Remaining tasks

- ❑ Vacuum Acceptance test of SEMgrids
- ❑ Mechanical installation of SEMgrids
- ❑ Installation of AEGIS line
- ❑ Reconfiguration DEM line
- ❑ Pumpdown and leak detection
- ❑ Bake out of transfer lines
- ❑ Update SCADA application
- ❑ Commissioning of transfer lines vacuum control system

# Present situation

Test to validate the use of glue in presence of NEG to repair wires ongoing

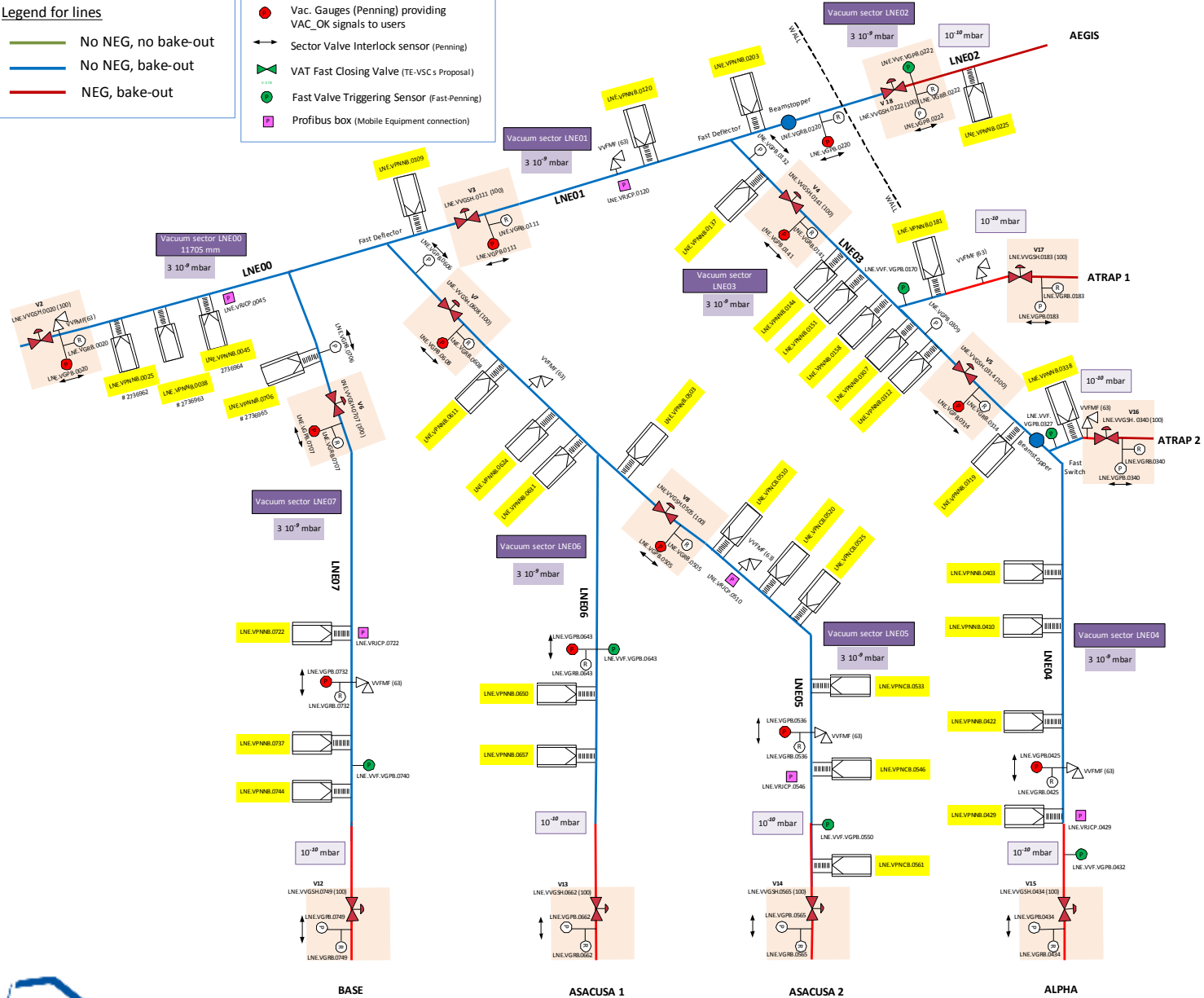


F. Butin presentation ADTC meeting 6<sup>th</sup> of February

**Legend for lines**

- No NEG, no bake-out
- No NEG, bake-out
- NEG, bake-out

- Vac. Gauges (Penning) providing VAC\_OK signals to users
- ↔ Sector Valve Interlock sensor (Penning)
- ▶ VAT Fast Closing Valve (TE-VSC s Proposal)
- Fast Valve Triggering Sensor (Fast-Penning)
- P Profibus box (Mobile Equipment connection)



# Bake-out of transfer lines

- ❑ Very busy period of LHC bakeouts → LHC will have priority for bakeout preparation (limited resources)
- ❑ Power cuts W16 and W20 to W22? → Incompatible with bakeout activities → Conflict with bakeout of LNE07

Task Name	Dural	Start	F	Qtr 2, 2020											
				April 2020					May 2020				June 2020		
				W229	W230	W231	W232	W233	W234	W235	W236	W237	W238	W239	W240
4 Power cuts	355 days	Wed 19/12/18	T	[Hatched bar]											
Secured networks tests 2018	0.5 days	Wed 19/12/18	V												
Tests 2019	0.5 days	Tue 16/04/19	T												
Auto transfer tests 2020	5 days	Mon 11/05/20	F												
AUG tests 23 & 24 May 2020	2 days	Fri 22/05/20	M												
Secured networks tests 2020	1 day	Tue 26/05/20	T												

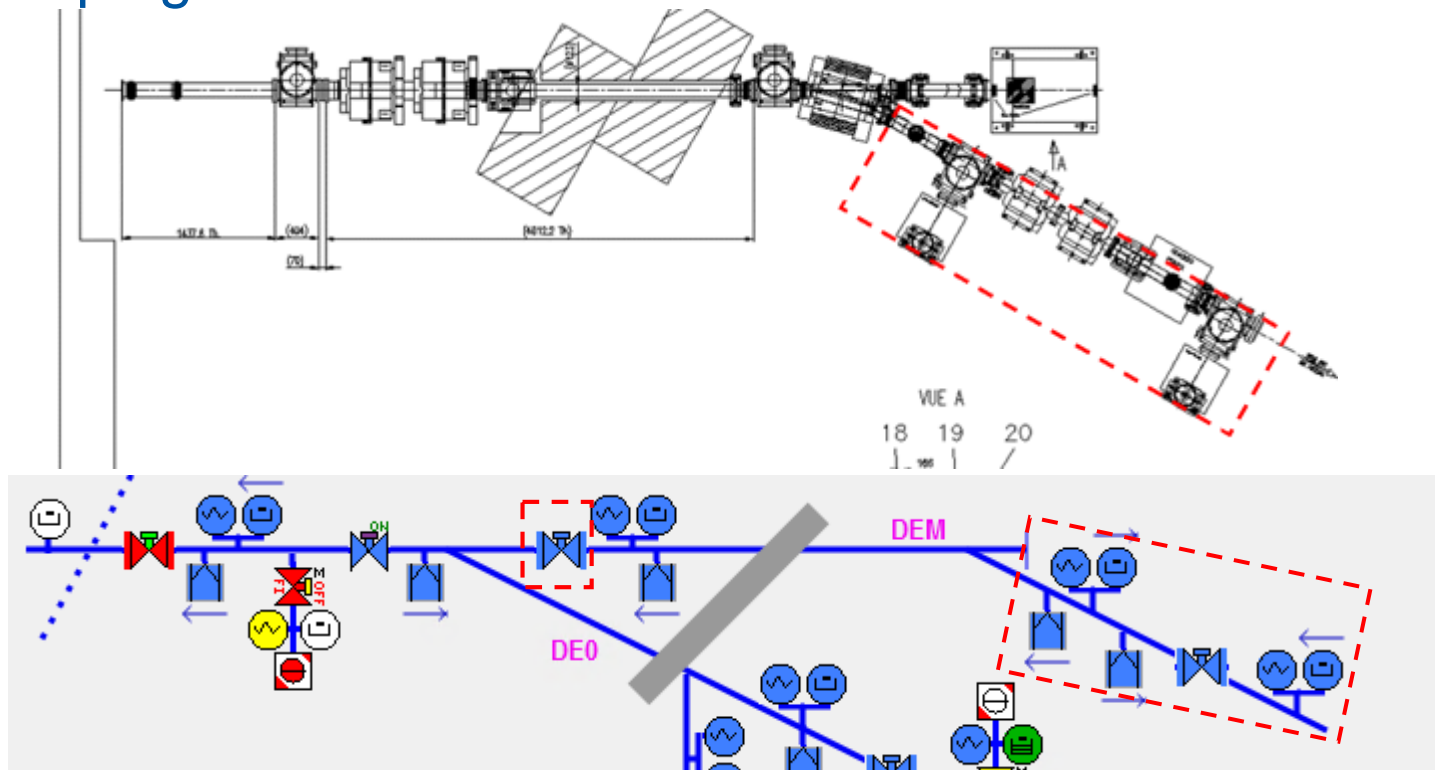
- ❑ Holydays not taken into account in planning: i.e. Easter in the middle of LNS20, LNE00 and LNE03 bakeout. 3 days of holidays in May and June. Less resources during holidays period
- ❑ Ideally a bakeout should start at the beginning of the week. If everything is ok bakeout ~ 4 days, but preparation can take longer than planned. Sequential order of bakeout.

# Bake-out of transfer lines

- ❑ Bakeout without commissioned control system to be avoided
- ❑ TE-VSC would like to avoid to reopen sectors once pumped and leak tested → Imperative after bakeout!
- ❑ High risk the work is not finished before commissioning
- ❑ Mitigations?
  - ❑ Long pumpdown and NEG activation without bakeout? →  $10^{-8}$  mbar enough for commissioning?
  - ❑ Tests starting soon

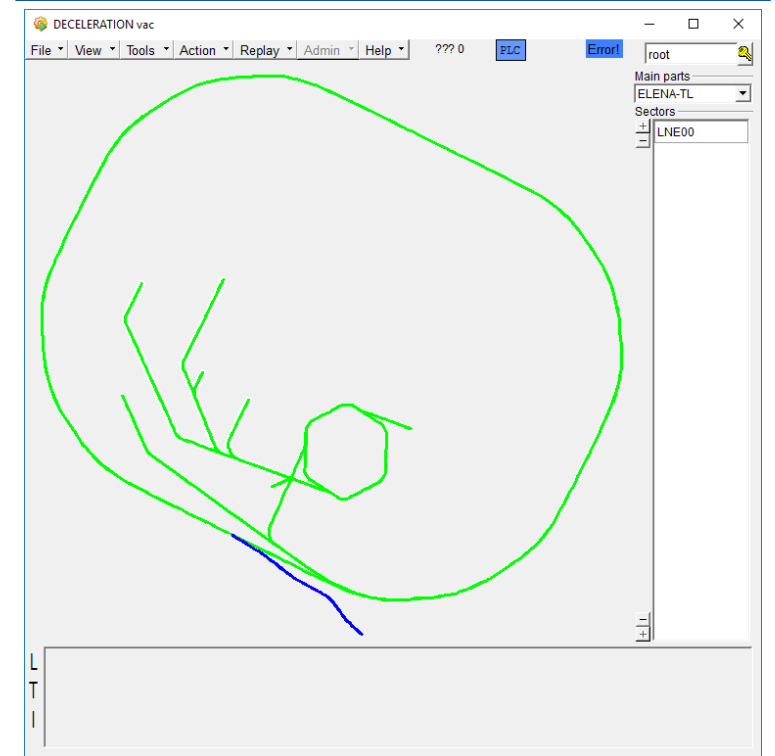
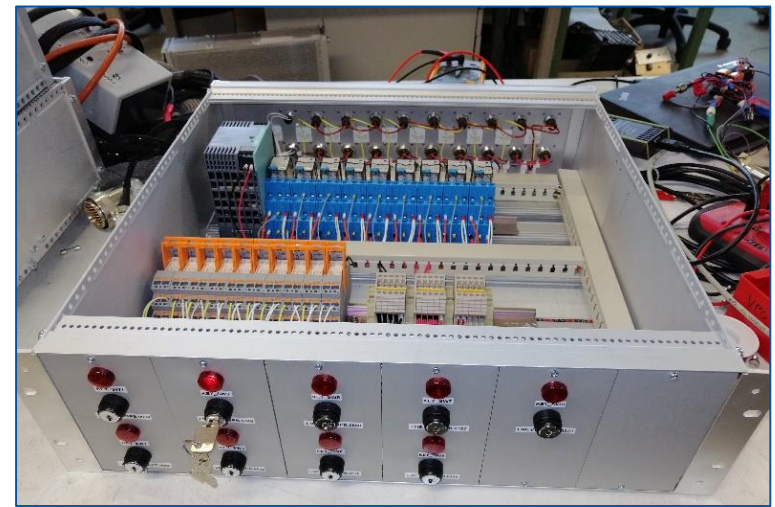
# New layout DEM line

- AEGIS finally connected to LNE02. Old connection to be removed
- One sector valve to be removed from the line → Easier pumping



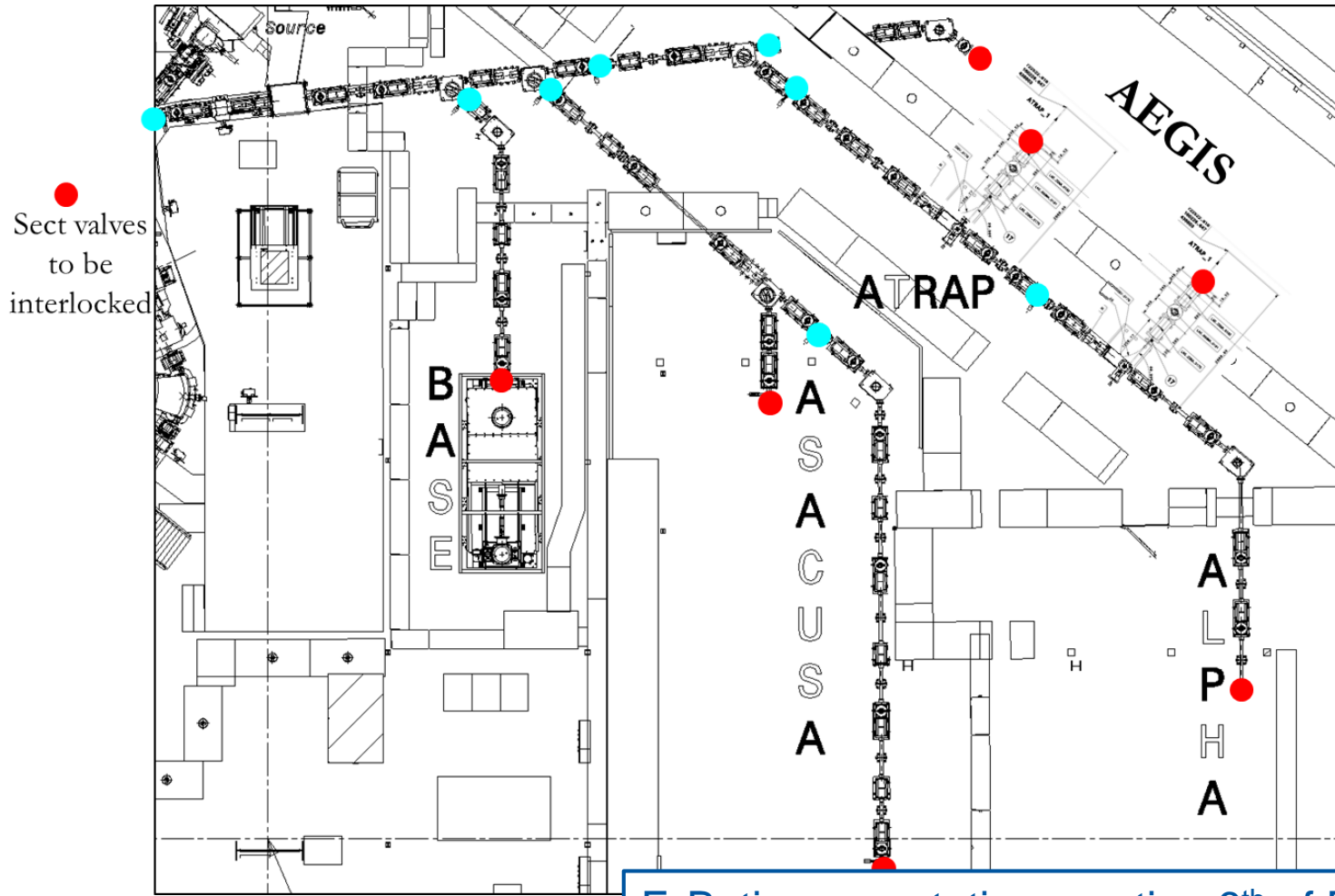
# Vacuum control

- ❑ Improvements on the remote operation of the fast valve → “Valve ready” shown in SCADA
- ❑ Crate to bypass an interlock (VGPF) for fast valve during works in one line → Procedure
- ❑ New SCADA application under development
- ❑ Commissioning of the new cables and equipment after cabling campaign
- ❑ Interlock valve connecting the experiment with a signal from access system
- ❑ e-groups to manage user permits → manage by AD Op and experiments





# Valves before experiments will be interlocked with signal from access system



# Summary

- SEMgrid installation and availability main concern to have the transfer lines under vacuum
- Bake-out planning needs to be reviewed
- Possible mitigation avoiding/postponing bake-out
- Vacuum controls progressing well, but a lot of equipment to validate when the sectors available
- New functionalities under development to better protect the machine against air inrush