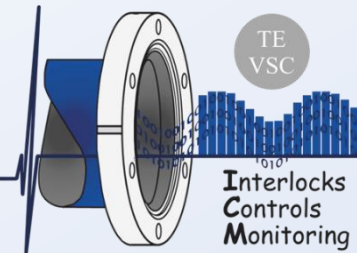


# Beam Gas Curtain

## BGC Vacuum Control System

Lampros Zygaropoulos  
Nikolaos Chatzigeorgiou  
Gregory Pigny

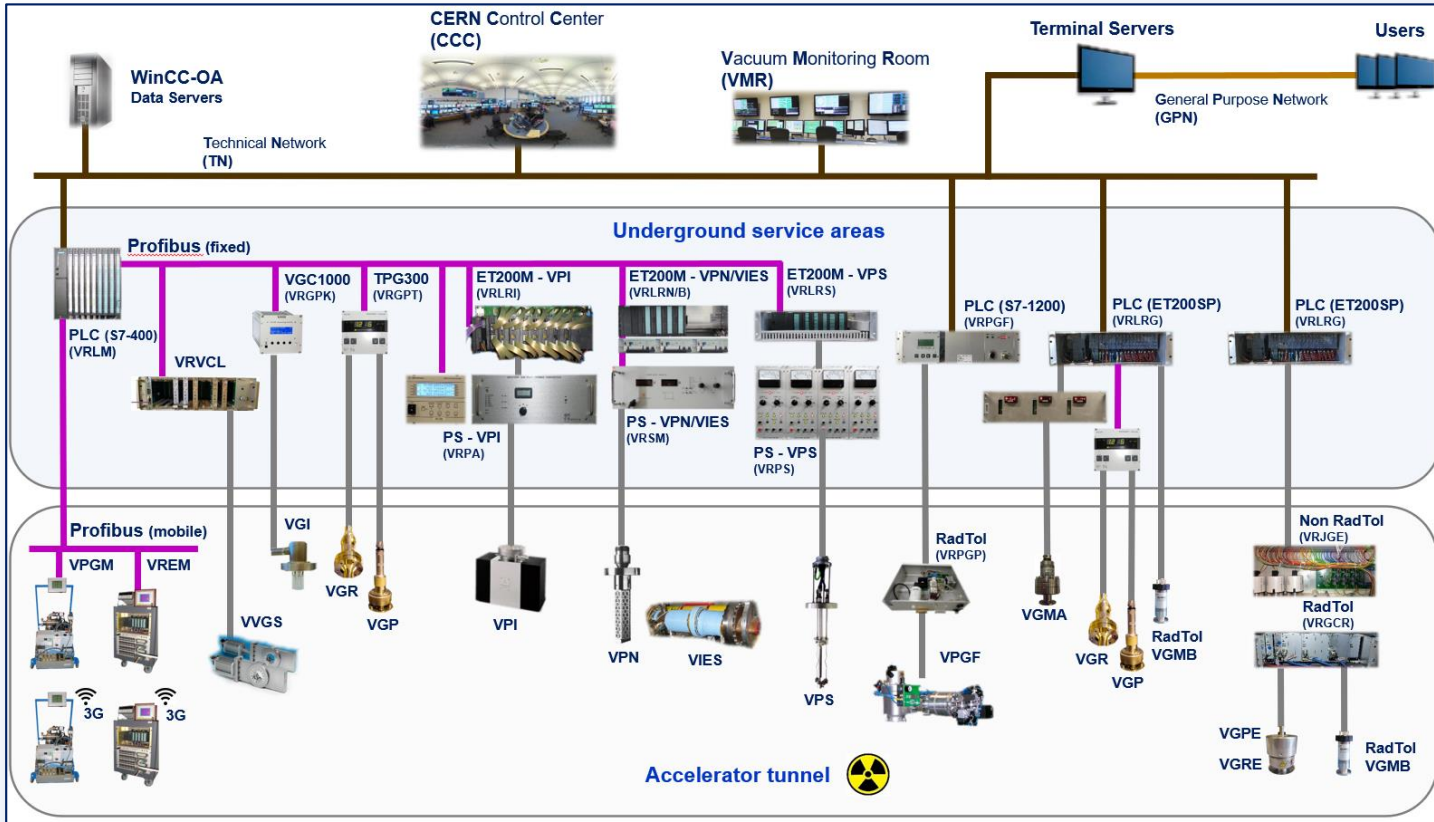


# Beam Gas Curtain

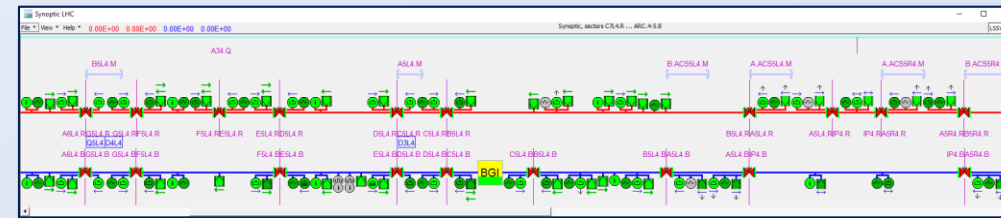
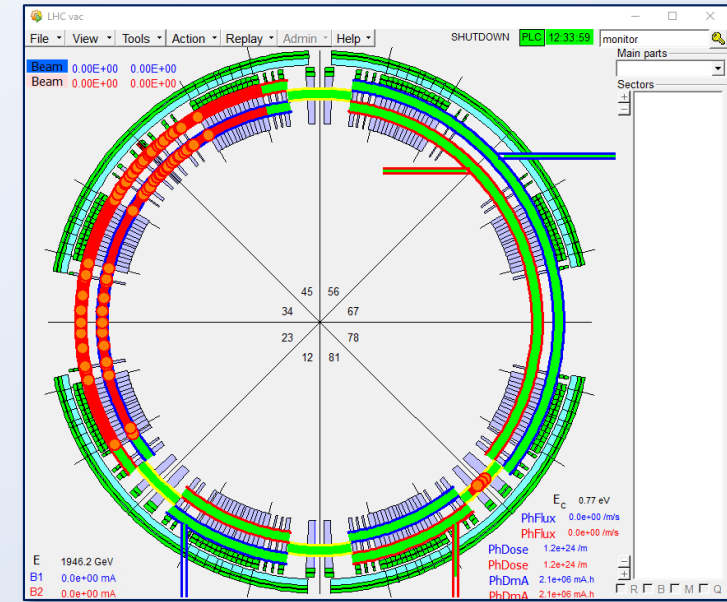
## ➤ Interlocks Controls & Monitoring section

- Responsible for the controls of Insulation & Beam Vacuum at CERN.
- Design, development, installation & maintenance.
- Supervisory & monitoring services through SCADA.

Vacuum Control architecture



LHC SCADA



# Beam Gas Curtain

## Current status and related equipment.

➤ BGC functional specification must to be finalized in order to start designing the control system.

### Equipment & quantities

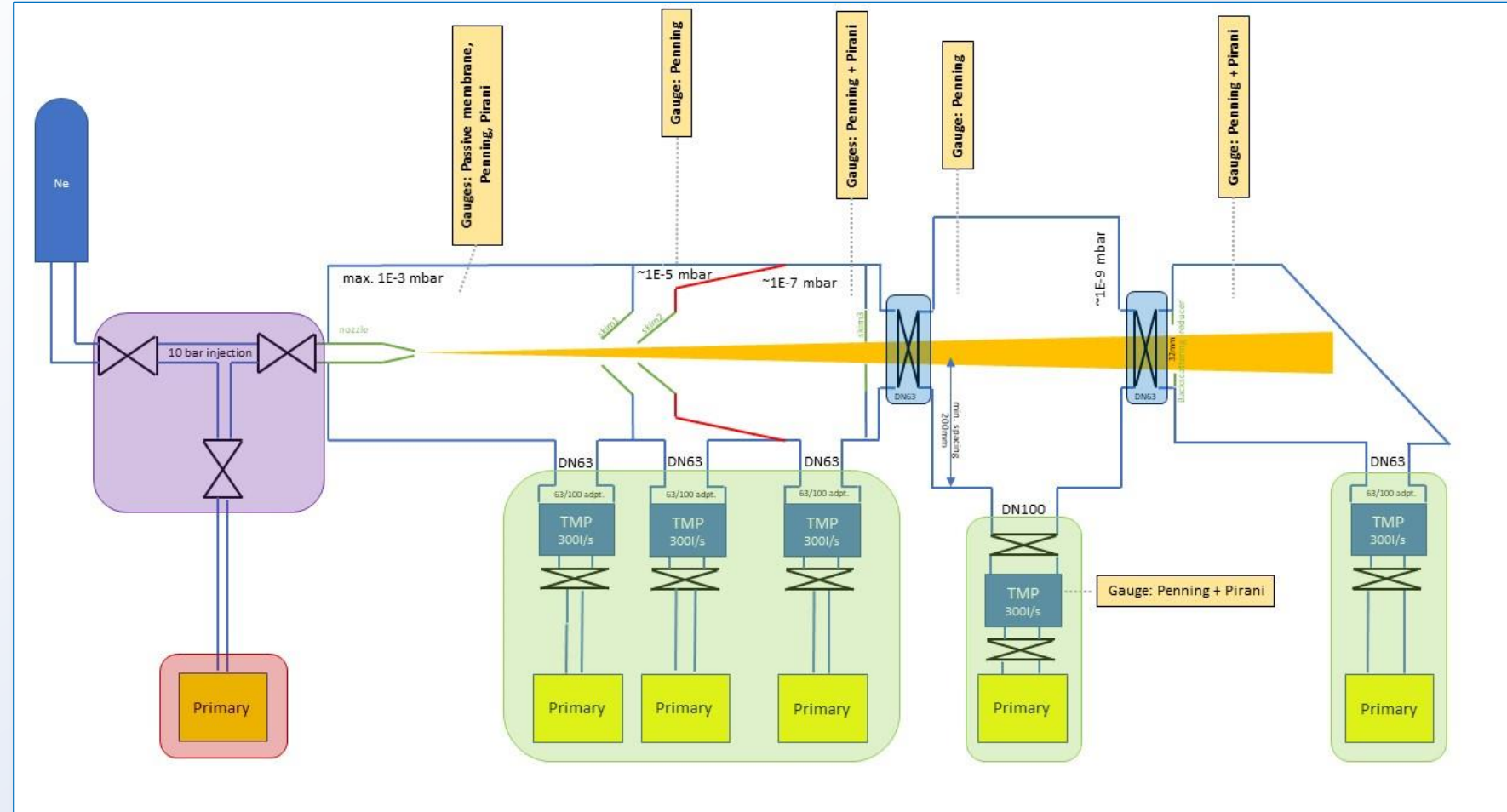
Penning Gauges (X6)  
Pirani Gauges (X4)  
Piezo-Membrane Gauge (X1)

Injection Valves (X3)

Primary Pump (X1)

Gate Valves (X2)

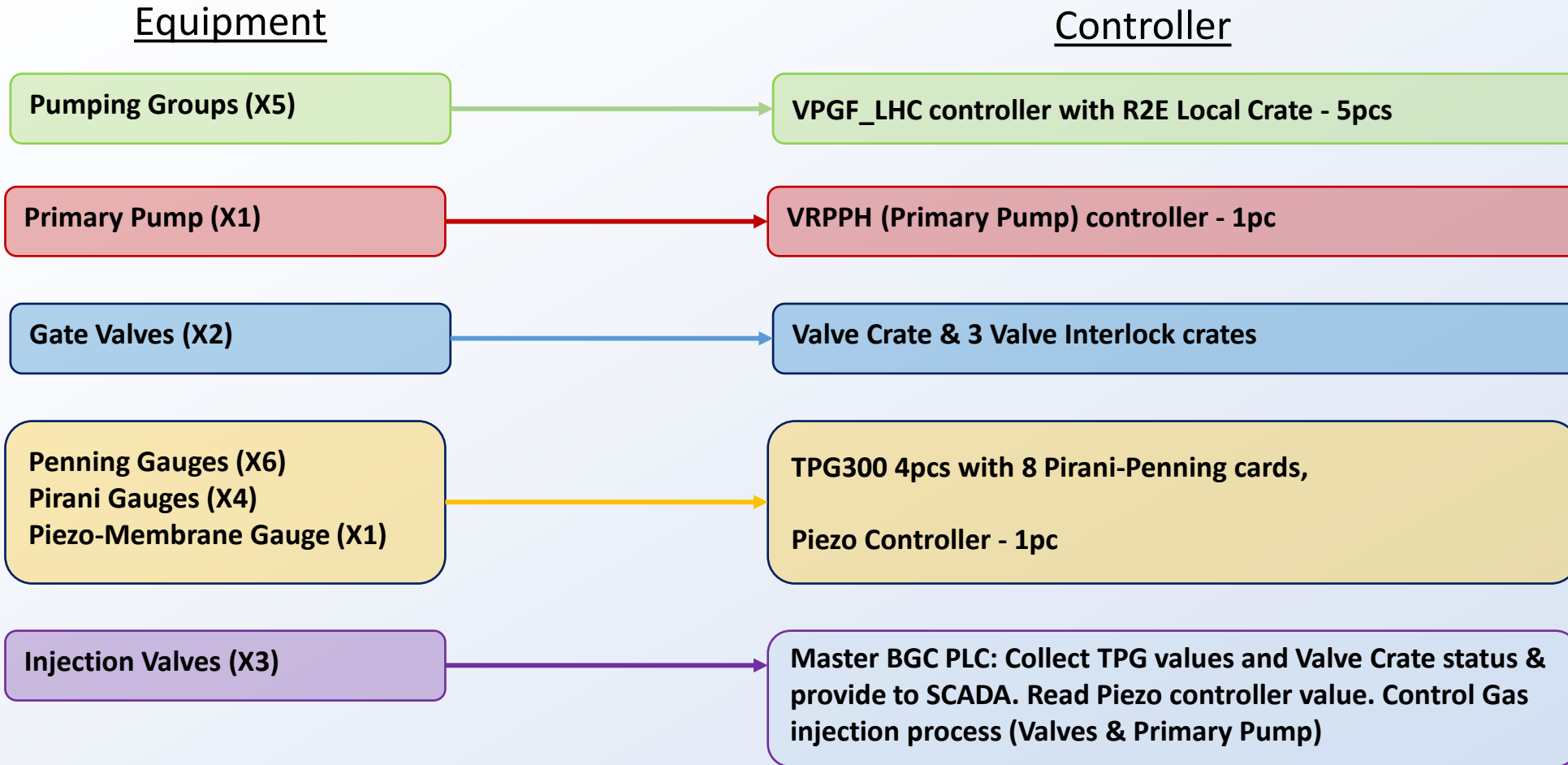
Pumping Groups (X5)



## Control equipment proposal

- Big delays in PLCs, mechanical and electrical components must be taken into account( up to 6 months).

Use of standard equipment for Vacuum Group: Modularity, reliability, no delay for design & testing, spares, faster, easier & more safe interventions.



## Cabling status

➤ Deadline for YETS 22-23 cabling requests at 13 May 2022!

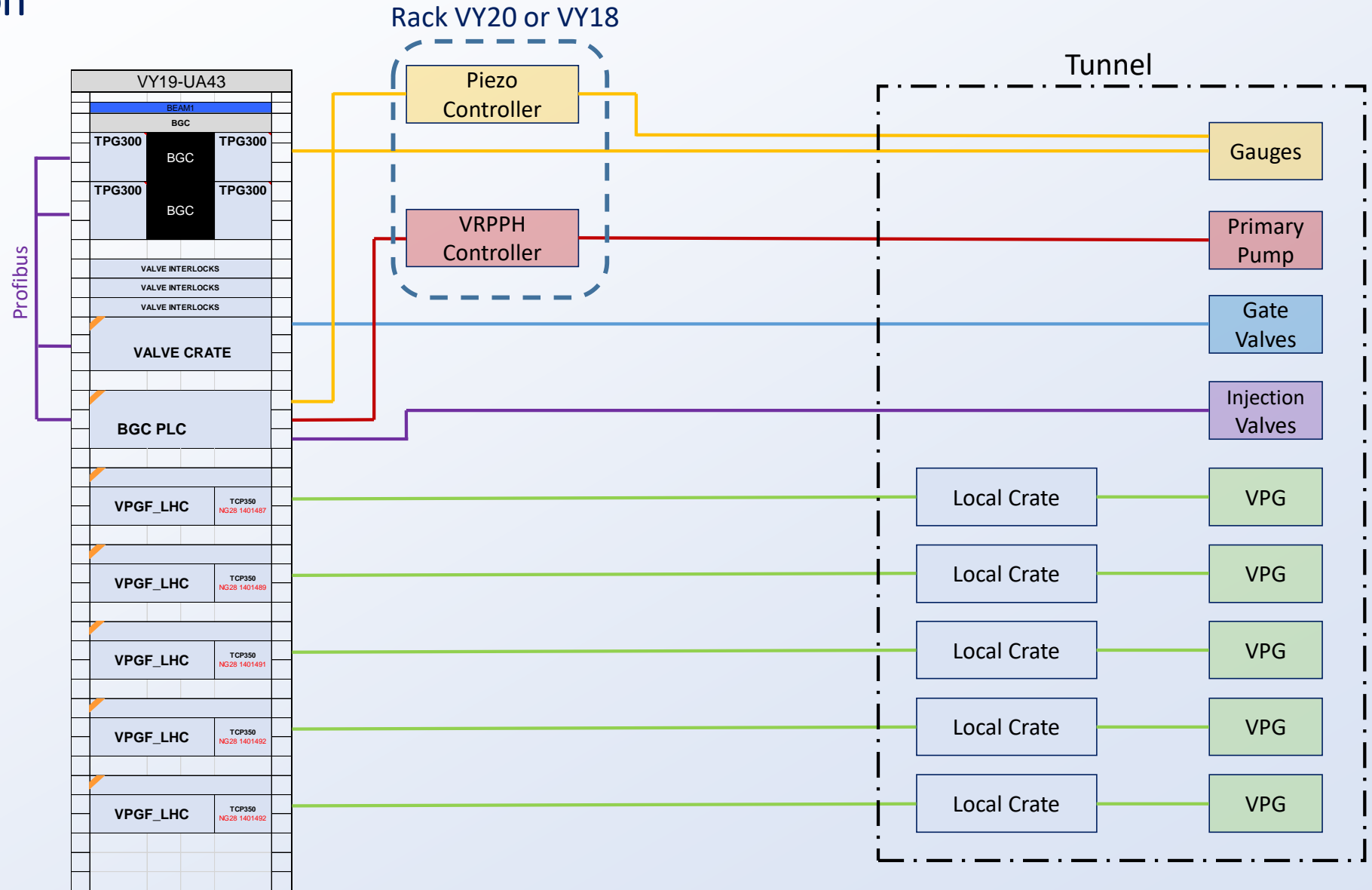
- Cabling & Powering Request made at 22/5/18.
- Cabling survey at 26/1/2022 with Marton Ady & Gerhard Schneider.
- Part of this cables used for BGI, will be released end of 2022.
- Still cables missing and we must foreseen additional equipment.
- Ethernet sockets: Request for 2 more.
- Powering request for injection Primary Pump, UPS power strips and any additional equipment.

TYPE	CABLE	PCS	FREE	BGI	SPARE	INSTALL
VPG	NE48-NG28	5	4	2	1	0
SECTOR VALVES	NF12	2	3		1	0
PIEZO	NG4	1	0		0	1
PIRANI	NG4	4	2	2	1	1
PENNING	TFA3	6	5	2	1	0
INJ. VALVES	NF12 or NE8	3	0		0	3
PRIMARY PUMP	PJ3SJ	1	0			1
Ethernet Sockets		6	4			2
Power Request						

# Beam Gas Curtain

## Rack & Tunnel integration

- Rack VY 19 is not enough. Probably we will expand to VY20.



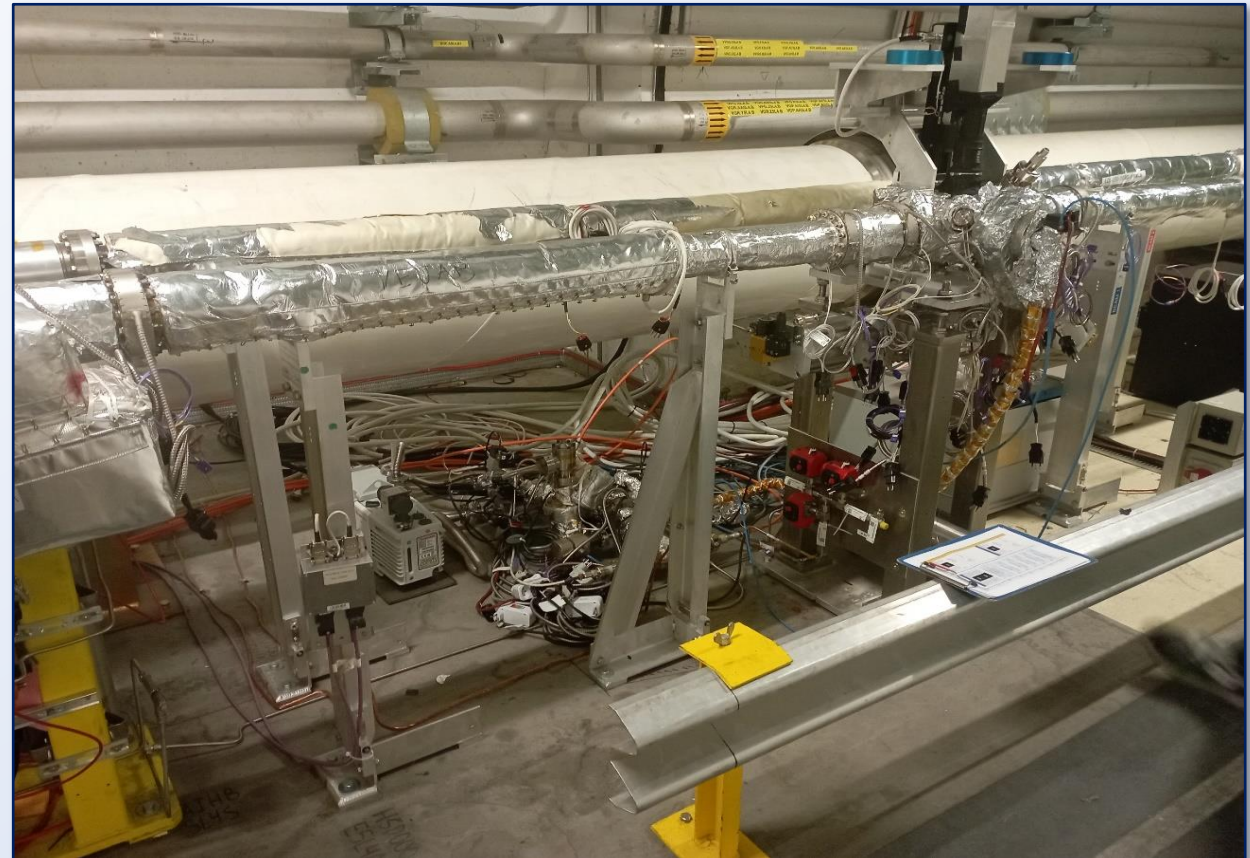
## Tunnel Integration

- Limited space.
  - We have 5 Local Crates in total. We have to use Rack big enough to fit these crates.
  - Space integration study must be done concerning control equipment.
  - In case of not approval, we will have to change our architecture.

Proposed Rack to be installed

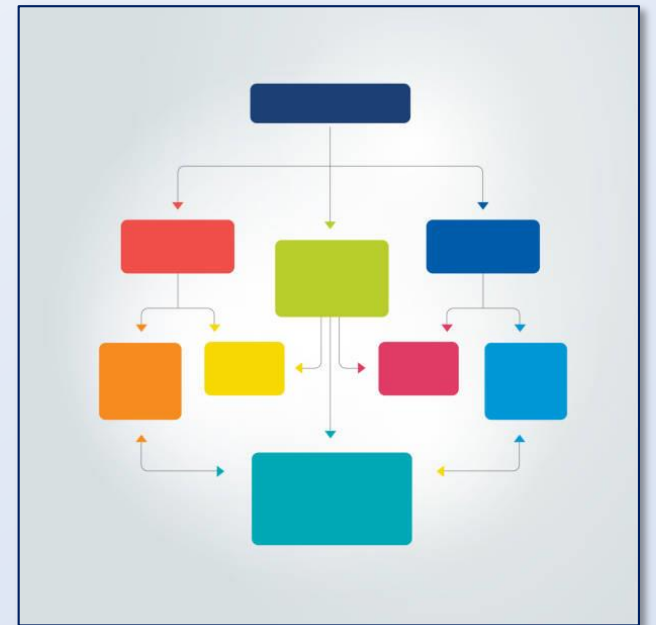


Tunnel status today



## Automation Process Control:

- Development will start after functional specifications are defined.
  - ICM will evaluate what standard controls can be used and what should be developed.
  - Study conditions, constraints & interlocks.
  - Study global integration of Valve interlocks with gauges & other sectors.
  - PLC software development.
  - SCADA development.
  - Test thoroughly at Test Stand before installation.





## Project sequence, deadlines & milestones.

- BGC functional specifications are finalized.
- Study & design control system, Integration study.
- Materials procurement. (6 months delay for reception)
- Pre-cabling requests: (YETS22-23 deadline 13/5/2022).
- Software PLC & SCADA development.
- Material reception & shipment to external company for assembly.
- Controllers manufacturing (2-3 months).
- Controllers reception & Test Stand installation.
- Testing thoroughly. (interlocks, failing scenarios etc)
- Engineering Change Request & Cabling Requests (ECR )
- Tunnel installation & commissioning.

Thank you for your attention!  
Questions?

