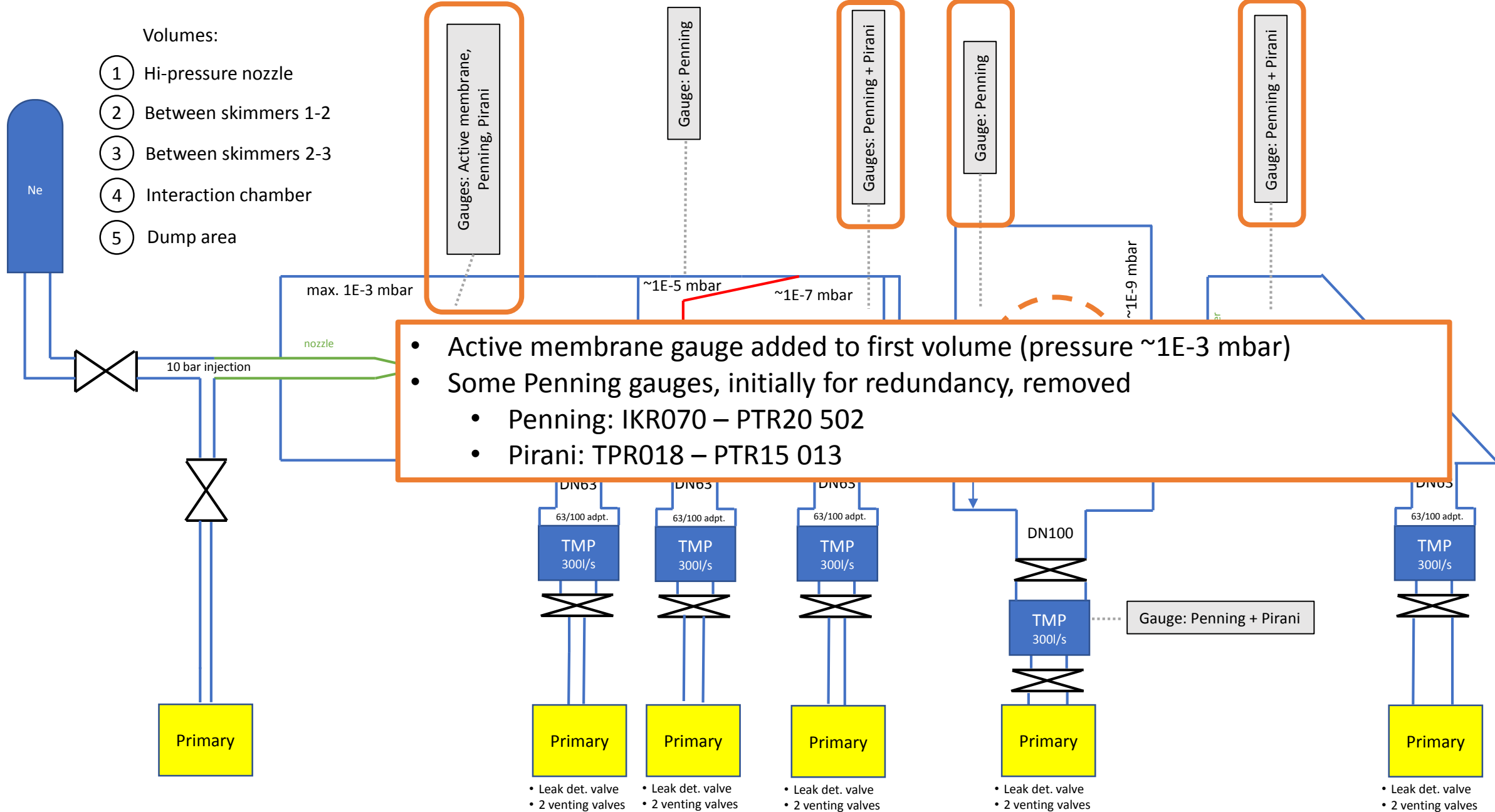
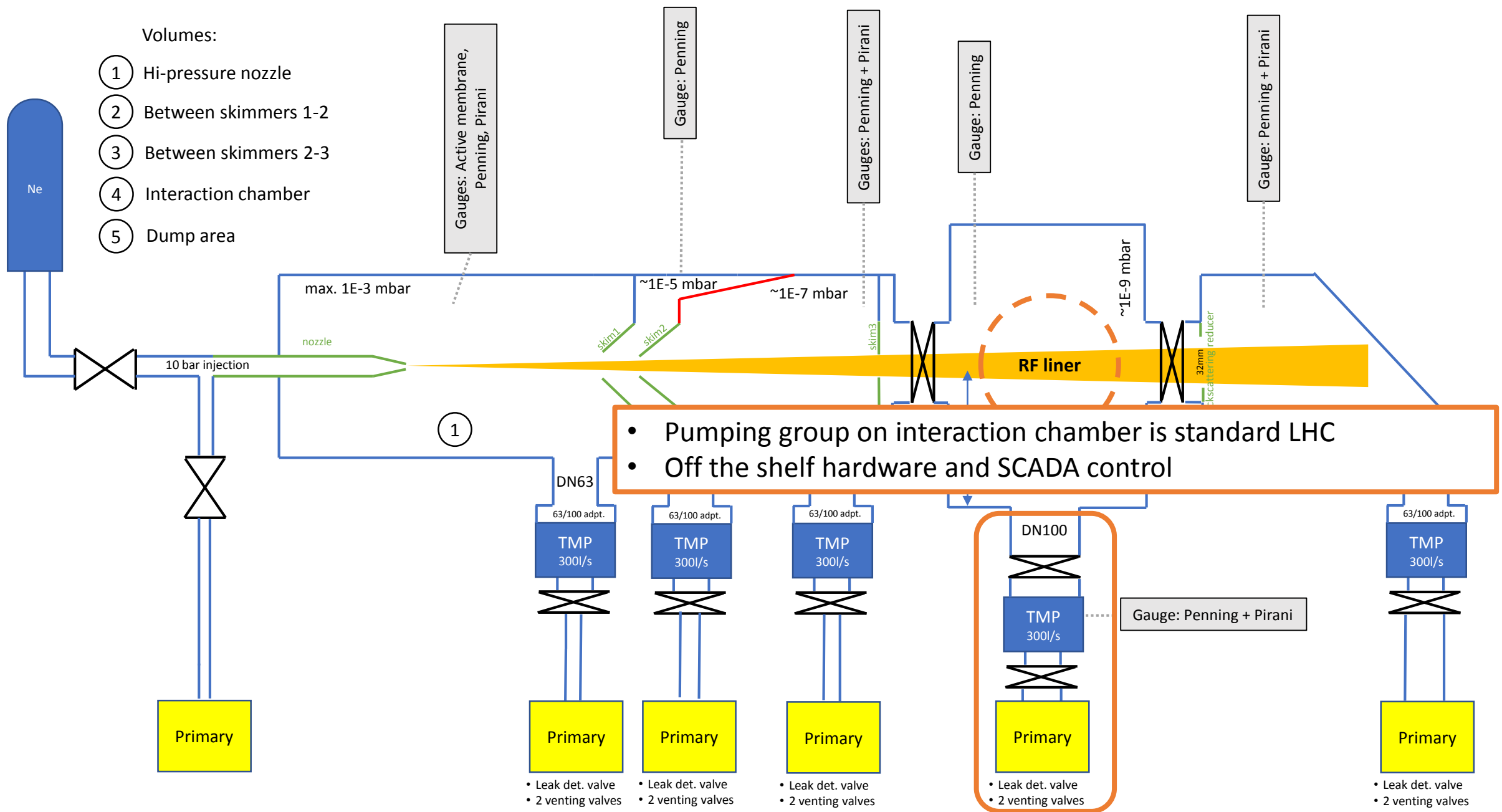


V3 instrument Controls and integration update

Marton Ady

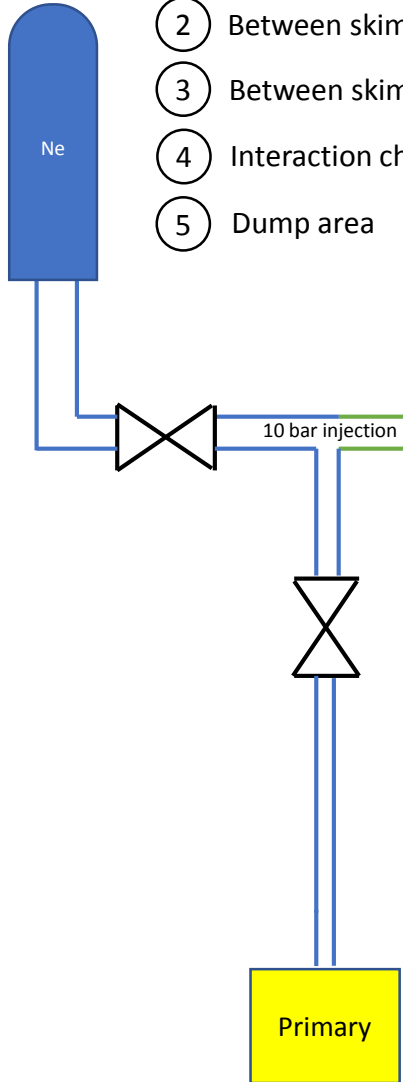
BGC collaboration meeting 10.12.2020



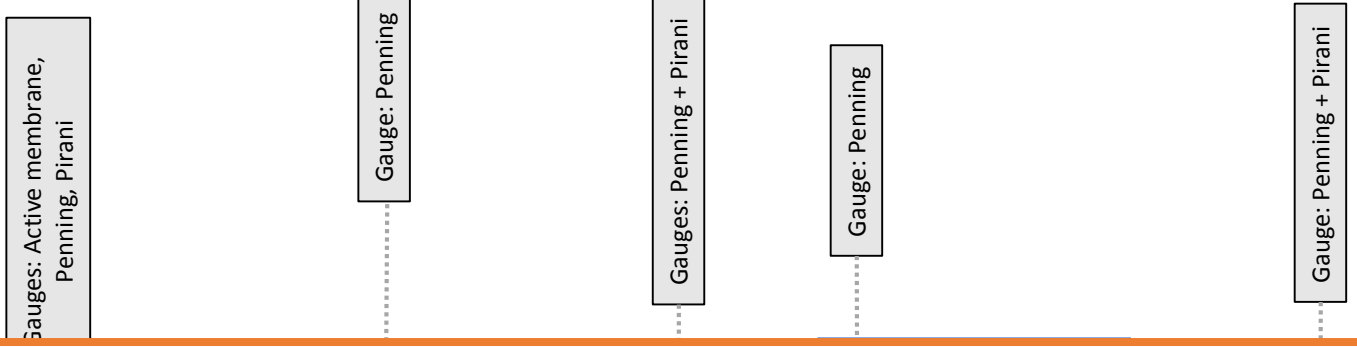
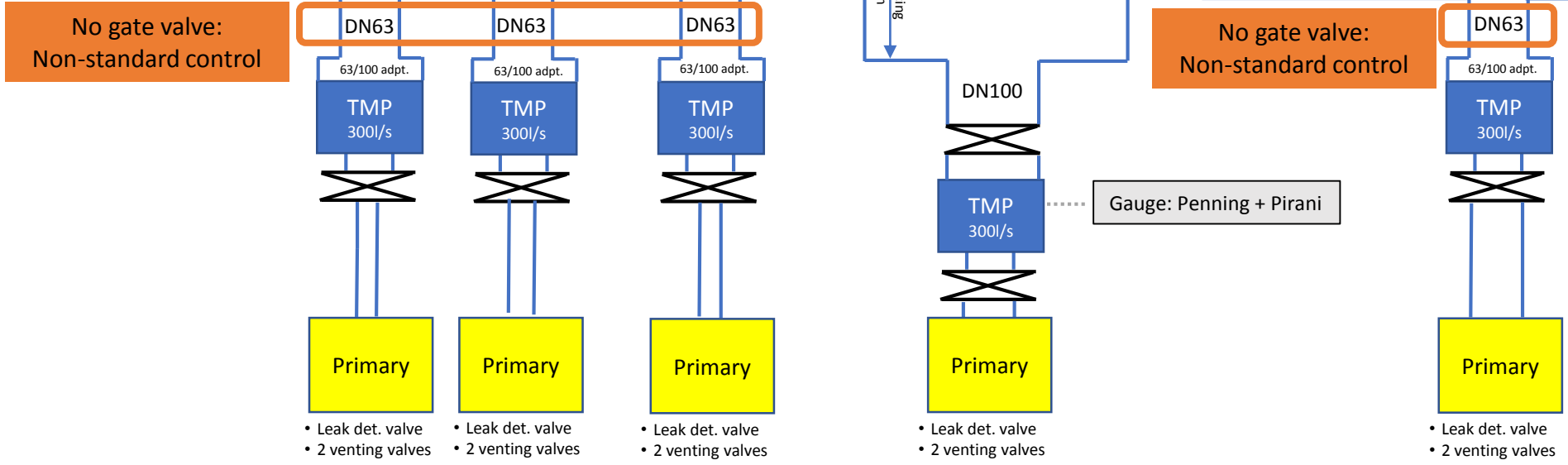


Volumes:

- ① Hi-pressure nozzle
- ② Between skimmers 1-2
- ③ Between skimmers 2-3
- ④ Interaction chamber
- ⑤ Dump area

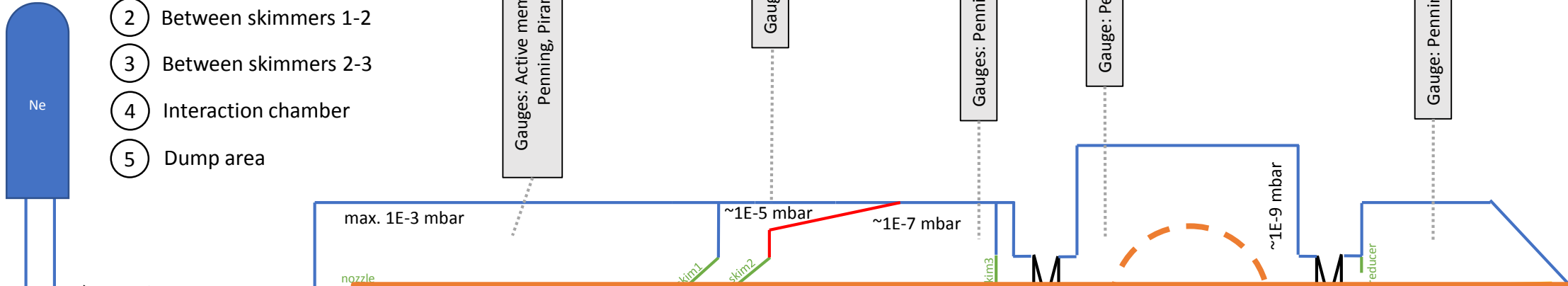


- Other 4 pumping groups won't have gate valve
- Custom control, based on standard group
- Control logic must be modified
- Straightforward process, remove references to VVR and rethink interlock logic
- Primary pumps: to be decided RV12 (oil risk), dry pumps (viton seal risk), SOGEVAC (smaller)
- RV12 is compatible with radiation, for others: check actual models

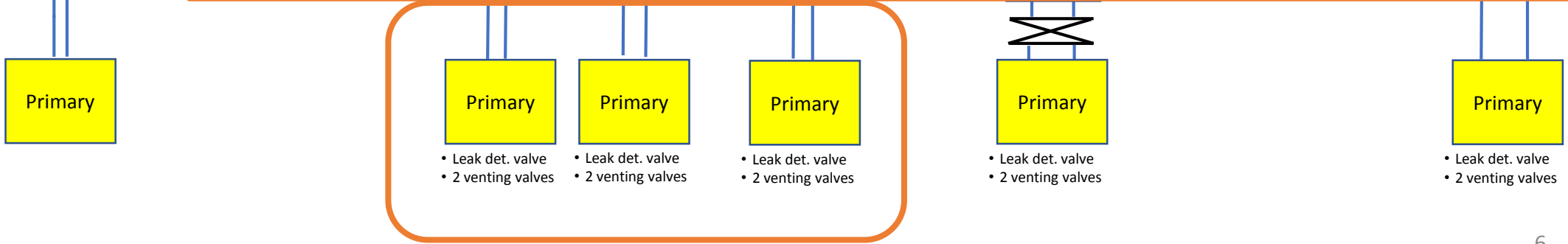


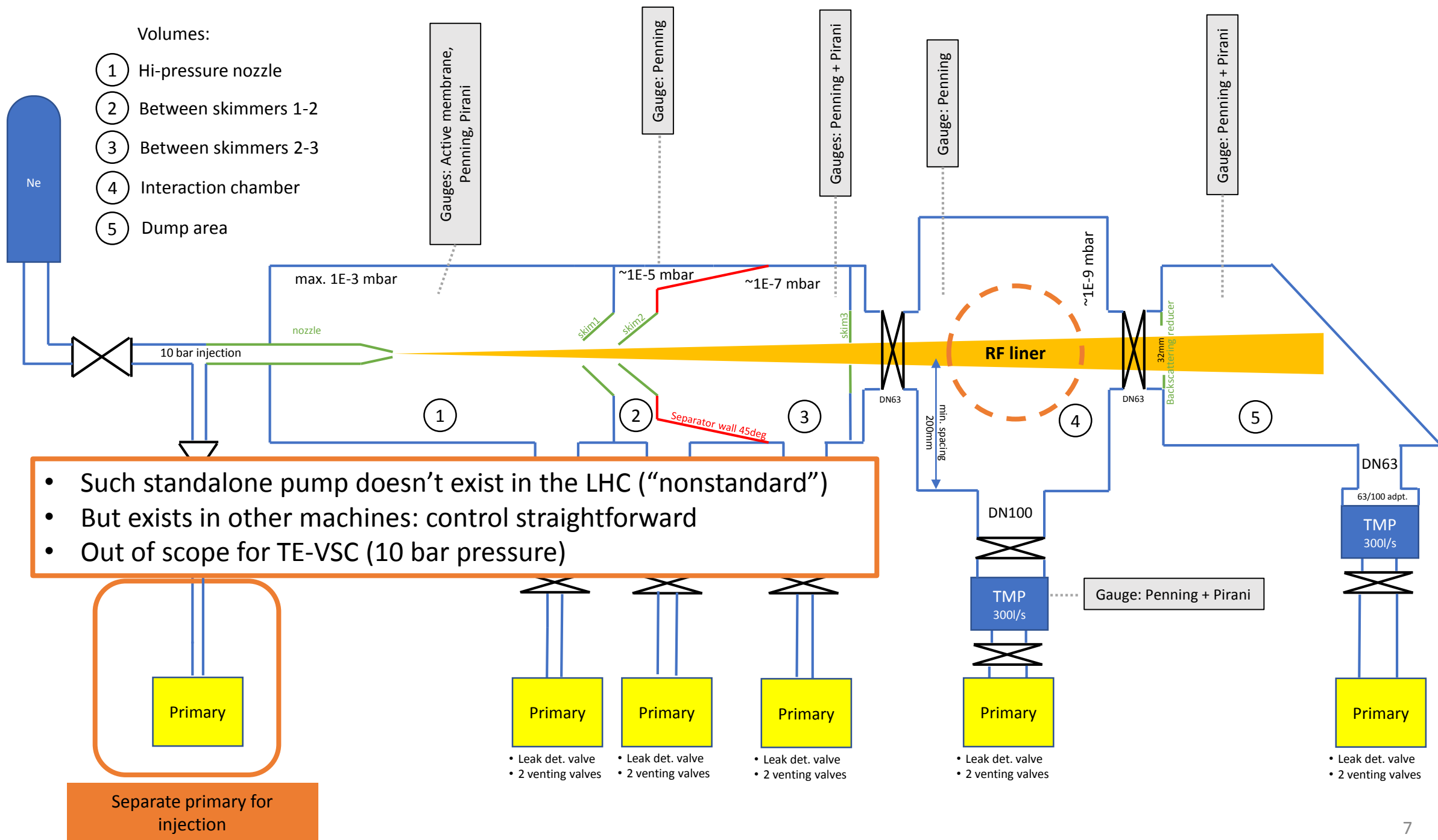
Volumes:

- 1 Hi-pressure nozzle
- 2 Between skimmers 1-2
- 3 Between skimmers 2-3
- 4 Interaction chamber
- 5 Dump area



- Option: make more compact racks (element grouping) OR couple primary pumps
- Motivation: takes less space (and for coupled primaries: pumps and cables cost less)
- Needs control design (hardware and software) from scratch:
 - Manpower (design, order, program)
 - Can take several months
 - New type of component - needs testing before integration
- There is a similar hardware solution in ISOLDE, but control logic is different
- Nonstandard component: custom maintenance instructions





• Such standalone pump doesn't exist in the LHC ("nonstandard")

• But exists in other machines: control straightforward

• Out of scope for TE-VSC (10 bar pressure)

Status & schedule

- TMP pumps (5xPfeiffer HiPace 300) already ordered, arrived at Cockroft Institute
- C.I. will operate these with own primaries (sending CERN equipment would require backing infrastructure)
- Between March and May 2021, v3 instrument will arrive to CERN for surface testing
- Controls will be developed and tested once the system is here
 - TE-VSC requests hands-on access for testing and optimization
 - This testing will answer open questions (coupling of primaries, type of primaries, etc)
- Surface testing: TE-VSC can provide “spare” pumping groups
- Once setup finalized, crates can be ordered
 - Max. 3 months if using standard components
 - Significantly longer if custom hardware and logic
- If BGC automation is required, +1PLC is needed with custom software

Backup: component list

	BGC - Gas injection			LHC beam vac	DUMP
	Vol1	Vol2	Vol3	Vol4	Vol5
GAUGES	Active Membrane Gauge				
	Penning	Penning	Penning	Penning	Penning
	Pirani		Pirani		Pirani
GATE VALVE	-	-	-	GATE VALVE DN100	GATE VALVE DN63
TMP	Hipace 300 - CF - 1000m	Hipace 300 - CF - 1000m	Hipace 300 - CF - 1000m	Hipace 300 - CF - 1000m	Hipace 300 - CF - 1000m
VVT - venting turbo	VAT - Angle valve DN16KF	VAT - Angle valve DN16KF	VAT - Angle valve DN16KF	VAT - Angle valve DN16KF	VAT - Angle valve DN16KF
VVD - leak detector	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF
VVI - valve to primary	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF
VVP - venting primary	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF	VAT - Angle valve DN25KF
Primary pump	Edwards - RV12	Edwards - RV12	Edwards - RV12	Edwards - RV12	Edwards - RV12