

# Preliminary discussion on LS3 activities

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3<sup>rd</sup> February 2025

# Standard maintenance for ALICE Gas Systems

## Standard maintenance covered by the M&O work-package agreement

- Some activities will require the STOP of the system
  - Activities which require stop of the system will be scheduled in parallel with other activities
  - They will be coordinated with the detector responsible (we will contact them asap)
- Maintenance activities will be schedule from Q3 2026 to ~ Q2 2029
  - Some activities can be done early but others better to do at the end of LS3 (example safety valves checks and MFC calibration)

<b>FSU Manpower:</b>	<b>35 weeks</b>
<b>STAFF Manpower:</b>	<b>52 weeks</b>
<b>System STOP:</b>	<b>3 weeks per system 21 weeks in total</b>

Activity	2019				2020			
	T 1	T 2	T 3	T 4	T 1	T 2	T 3	T 4
Purifier module maintenance								
Mixer module maintenance								
Distribution module maintenance								
Pump module maintenance								
Exhaust module maintenance								
Electrical maintenance								
PLC replacement + Software								
Analysis module maintenance								
General maintenance								

# Standard maintenance for ALICE Gas Systems

ALICE Gas System Standard Maintenance during LS2 per experiment															
Activity	2019				2020				FTE (weeks)					Responsible	Comment
	T 1	T 2	T 3	T 4	T 1	T 2	T 3	T 4	CERN	Mech	Weld/Pipe	Elect	FSU total		
<b>Purifier maintenance</b>															
cleaning of valves	x	x							0.6	0.6			0.6	Site responsible	2 purifiers TRD, TOF
modification with manual valves filters bypass	x	x							2		2		2	Site responsible	4 purifiers TOF, TRD, MTR, TPC
pressure vessel check & leak test	x	x					x	x	1	1			1	Fred	TOF, TRD, MTR, TPC Purif et CO2 Removal
replacement of material	x	x					x	x	2	1.5			1.5	Andrea	TOF, TRD, TPC (CO2 Removal????)
change of filters	x	x					x	x					0	Site responsible	TOF, TRD, MTR, TPC Purif et CO2 Removal
Electrovalve change by pneumatic + Festo	x								1	1		1	2	Site responsible	TPC & Co2 removal
Regeneration HMPID							x		0.4	0.2			0.2	Site responsible	
<b>Mixer maintenance</b>															
MFC check + recalibration							x	x	2	3			3	Beatrice/Kacper	
<b>Distribution maintenance</b>															
flowcell check + calibration						x	x	x	1	1		0.5	1.5	Michal	
check bubblers								x	0.2				0	Site responsible	
Vanne bloc Festo (control et remplacement vannes)			x	x					0.5	0.5		0	0.5	Site responsible	
Filtres	x	x	x	x	x	x			0.5	0.5			0.5	Site responsible	TPC
Check regulation valves									0.5			0.5	0.5	Site responsible	
<b>Pump maintenance</b>															
Change of membranes +service							x		3	2	0	0.5	2.5	Kacper/Site responsible	TPC 1 et TRD 3 maintenance pompe
Check regulation valves	x	x	x	x					0.2	0	0	0	0	Site responsible	
Upgrade filter + pt for DeltaP	x	x	x	x					0.5	0	1	1	2	Kacper/Site responsible	TOF, TRD, TPC, MTR
<b>Exhaust module</b>															
Buffer volumes to be qualified	x	x	x	x					2	1			1	Fred	TPC, TOF, TRD, TRD recuperation
Upgrade filter + pt for DeltaP							x	x	1		1	1	2	Site responsible	TOF, TRD, TPC, MTR
<b>Electrical maintenance</b>															
Change of power supplies (18 V/ 24 V)	x	x	x	x					0.5	1	0	1	2	Lukasz/Patrick	TPC(2), TRD(3), TOF(3), MTR(3) HMPID(1), MCH CPV PMD(3), AUX(2)
Canbus quality			x	x					0.5	0	0	0	0	Michal	
Profibus quality	x	x	x	x					0.5	0	0	0	0	Patrick	
Check/repair connectors	x	x	x	x					0.5	0	0	1	1	Patrick	Earth connection
Heating cables purif + bloc regul.	x	x	x	x					1	0	0	1	1	Patrick	
PLC replacement + Profibus separation (With quality check)	x	x	x	x					1.5	0	0	3	3	Michal	9 pcs: TPC, TRD, TOF, MTR. HMPID, CPV, PMD, MCH, AUX
<b>Analysis</b>															
Check/change of analysis devices				x	x	x			1	0	0	0.5	0.5	LPh/Site responsible	HMPID H2O, TPC O2, TRD O2 maintenance
Calibration of all analysis devices							x	x	1	0	0	0	0	LPh/Site responsible	Chemical cells to change
Manifold analysis					x	x	x	x	0.5	0	0	0	0	LPh/Site responsible	LS2 to check, LS3 to replace
<b>General</b>															
Pressure sensors: change/calibration	x	x	x	x					1	1		1	2	Beatrice/Site responsible	PT Atmospherique (1000CHF 2PT + 2 Afficheur)
Check/repair pneumatic valves	x	x	x	x	x	x			1	1	0	0.5	1.5	Site responsible	
Check/repair electro valves	x	x	x	x	x	x			0.5	0	0	1	1	Site responsible	
Check all bubblers							x		0.5	0	0	0	0	Site responsible	
Check/calibrate safety valves							x	x	1	1	1	0	2	Site responsible	
System Commissioning									12	0	0	0	0	Michal/Site responsible	2week per Big/med system 1 per small. Plus 2 weeks of site responsible for
Krohne			x	x	x	x			0.5	0.5	0	0.2	0.5	Kacper	TRD, TOF
									<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>	<b>Total</b>		
									41.9	16.8	5	13.7	35.3		

- We will prepare similar table to share with you

# Coordination of activities

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- **BE-EA: change of gas panels**
  - Schedule still to be provided but we will try to coordinate the activities if gas system will have to run
- **What will be the gas system status during LS3?**
  - On? Off? for how long? What gas mixture? etc.
  - We need inputs from detector people → we will contact them asap
- **We have to coordinate gas system maintenance and upgrades for four experiments**
  - We're collecting inputs
  - We will try to follow experiment schedule when possible

# New projects

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- **SOFTWARE:** some upgrades needed
  - Software regeneration and new commissioning
- **SOFTWARE/Electrical:** possible replacement of ELMB
  - Used to read the flowcells

**Please let us know of possible upgrades of existing detectors or new systems**