Maintenance Procedures

31 August 2020

Objectives

The purpose is to create standard procedures for the maintenance of the gas modules during RUN, STOP and RESTART phases, in order to keep track of the status of each module for each detector.
Standard means that they can be applied on the **majority** of the modules with some changes depending on the system. The data that will be collected will help us to improve the existing procedures and to understand if and where a more specific procedure is required and useful.

- Fill the Excel file containing the **schedule and results** for the maintenance of each module for each experiment

- **Perform the maintenance procedure** of each module **by compiling the provided forms** (with Leonardo if possible)

- **Provide feedbacks** for updating of existing procedures

Schedule and Results

The file Excel "MaintenanceResults" which contains the schedule and results for the maintenance can be found in the following directory in **DFS**:

G:\Departments\PH\Groups\TA1\Gas_group\002_LS2\MaintenanceResults

To do:

- Fill the "Expected" row for each module and detector with the expected date of performing of the maintenance procedure (If not already done)

- Fill the "Status", "Report" and "Date" according to the progress of the procedure

Detector Gas Systems		TPC	TRD	TOF	HMP	CPV	MCH	MTR
Mixer	Expected	Sep-20		Jul-20	Jun-20	Jul-20	Jun-20	Jun-20
	Status				In Progress	In Progress	In Progress	In Progress
	Report				Yes	Yes	Yes	Yes
	Date				########	########	29/06/202	26/6/2020
Distribution	Expected	Sep-20			Jul-20	Jul-20	Jul-20	Jul-20
	Status							
	Report							
	Date							
Pump	Expected	Sep-20		Jul-20	x	x	x	Jul-20
	Status				x	x	x	
	Report				x	x	x	
	Date				x	x	x	
Purifier 1	Expected	Sep-20		Jul-20	x	x	x	Jul-20
	Status				x	x	x	In Progress
	Report				x	x	x	Yes
	Date				x	x	x	07/08/2020
Exhaust	Expected	Sep-20		Jul-20	x	x	x	Jul-20
	Status				x	x	x	In Progress
	Report				x	x	x	
	Date				x	x	x	07/10/2020
Membrane	Expected	x		x	x	x	x	x
	Status	x		x	x	x	x	x
	Report	x		x	x	x	x	x
	Date	x		x	x	x	x	x
Analysis	Expected	Sep-20		x	Jul-20	x	x	x
	Status			x		x	x	x
	Report			x		x	x	x
	Date			x		x	x	x
Humidifier	Expected	x	x	x	x	Jul-20	x	Jul-20
	Status	x	x	x	x		x	
	Report	x	x	x	x		x	
	Date	x	x	x	x		x	

Form Compiling and Feedbacks

All the existing maintenance procedures can be found in the following directory in **DFS**:
G:\Departments\PH\Groups\TA1\Gas_group\002_LS2\MaintenanceProcedures

To do:

- Perform the maintenance procedure of each module and **compile the form** by following indicated steps in "Action List" and noting useful data in "Notes" (where requested)

- **Provide feedback** in the "Notes" section of the form. Feedbacks may include for example: Suggestions on how to improve the procedure, indication of components that are not present in a given system, indication of steps that can not be performed in a given system, etc… (VERY IMPORTANT)

MIXER MAINTENANCE PROCEDURE
Complete the form and print it at the end

SYSTEM:		DATE:	OPERATOR:		

Mixer in RUN system ON

WHAT	DESCRIPTION	STATUS	RESULT		ACTION LIST	Notes
LEDs check	Press the button in the mixer chassis and check if the leds are ok	☑ ~~Done~~	☑ Ok ☐ Problem ☐ Solved	(green)	Ok, go ahead with next step	
Check Pressure Reducers	Check PI-1X03 reading and compare their value with the corresponding PT-1X03 reading on WinCCOA. Is error less than 20%?	☑ ~~Done~~	☐ Ok ☑ Problem ☐ Solved	(red)	Take note of the two readings. If possible, set the corresponding PCV to zero and see which one doesn't read zero	
Lines pressure	Compare PCV Tescom gauge pressure with supply pressure on the wall panel for each line: regulator pressure should be lower than network pressure	☑ ~~Done~~	☑ Ok ☐ Problem ☐ Solved	(green)	Ok, next step	
	Check if the pressure of each line is *equal* to the DMFC calibration pressure (indicated on the device).	☑ ~~Done~~	☐ Ok ☐ Problem ☑ Solved	(blue)	Adjust the pressure reducer or try to fix the problem. Describe and record the problem	
	Check that pressure master MFC PI-1103 is lower than pressure slaves MFCs	☑ ~~Done~~	☐ Ok ☑ Problem ☐ Solved	(red)	Try to adjust and set it 0.3-0.5 bar below master pressure	
	Make sure that the smallest concentration line has the highest pressure	☑ ~~Done~~	☐ Ok ☑ Problem ☑ Solved		Please select only one option	

Example Feedbacks for Mixer

First feedbacks are being integrated in the procedure:

- Leak test part with N2 will be removed since the test can be carried on directly with a detectable gas.
  Very important: when performing the procedure for the first time on a system, indicate which gas is available: CO_2, Freon, other… (Keep in mind to choose among the gases for which we have a leak detector)

- Avoid the usage of Milles Bulles (apart from compressed air and N2 in plastic tubes)

- Removal of possible redundancies in the action list

Further modifications can still be integrated! Provide feedback if something is unclear or you have better ideas that can be taken into consideration.

Summary

Maintenance Results: G:\Departments\PH\Groups\TA1\Gas_group\002_LS2\MaintenanceResults

Existing procedures: G:\Departments\PH\Groups\TA1\Gas_group\002_LS2\MaintenanceProcedures

- **Mixer**: First feedbacks are being integrated in the procedure (e.g. Remove the leak test part with N2)
- **Exhaust:** To be tested with Louis-Philippe, Leonardo and whoever is available (Date?)
- **Pump:** To be tested with Kacper, Leonardo and whoever is available (Date?)
- **Purifier:** To be tested with Andrea, Leonardo and whoever is available (Date?)
- **Pre-Distribution:** To be tested later on

Missing procedures:

- **Distribution:** Work in progress, to be continued. Expected by W40
- **Humidifier:** To be started with the responsible. Expected by W43
- **Analysis O2/H2O:** To be started with Louis-Philippe. Expected by W46