

<b>Project</b>	Diagnosis of Filters degradation
<b>Industry / Asset</b>	Gas distribution / Expansion Station
<b>Country</b>	Belgium
<b>Year</b>	2020

## The Context

*How to objectively quantify the level of clogging in filters used in gas expansion station?*

In a continuous improvement process, a gas distribution company wanted to have a better monitoring of filter degradation. This one would help them to optimize the lifetime and to improve the interventions planning.

However, the client only had very limited information available about the filter condition. Moreover, due to the variable operating conditions, the degradation could not be assessed correctly.

To obtain this information a new approach was developed by Performance for Assets.

## P4A Solution

The customer was already using online monitoring to measure pressure drops in the filters. When the pressure reached a threshold, an alarm was triggered in the control room and an intervention request was sent to maintenance to plan an intervention for filters replacement.

This approach shows disadvantages:

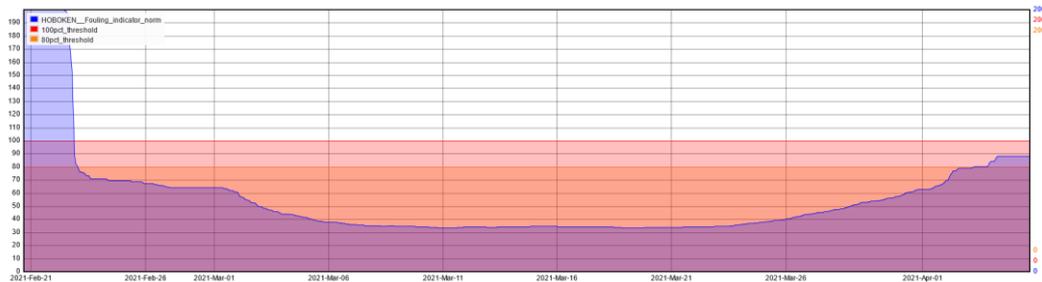
- No real possibility to anticipate the alarms.
- No optimisation of intervention planning.
- A sudden increase in flow could result in a sudden alarm.

To address these ones and **estimate more precisely the filter degradation**, P4A applied a physical approach based on the pressure drop model as a function of the flow.

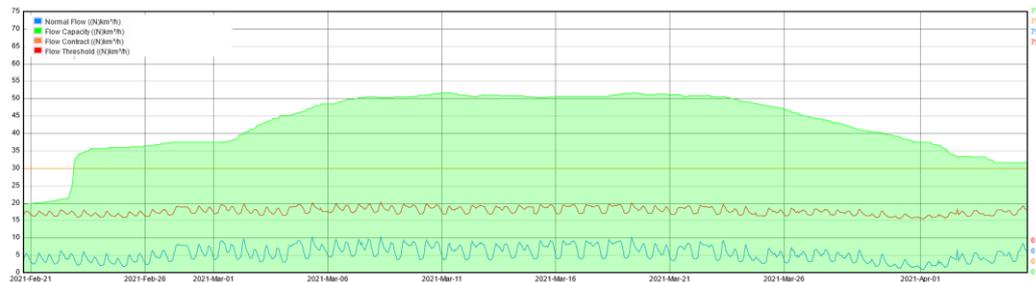
The output consists in an iterative estimation of the pressure drop coefficient filtered to mitigate measurement noise and modelling errors. This approach enabled to build **indicators not influenced by the operating conditions**.

The resulting indicators are:

- **Level of Clogging:** This indicator provides a view of the evolution of the filter degradation independently from fluctuating operating conditions.



- **Flow Capacity:** This second indicator expressed the residual capacity of the filter in terms of flow based on its degradation status (the pressure drop coefficient).



## Benefits

Thanks to the solution that was developed by Performance for Assets, the end user now has a clear view of the filter condition by visualizing the current flow and capacity.

- Early alarms generated by the level of clogging indicator to inform the client in advance about the evolution of degradation.
- Good insight of the remaining lifetime thanks to the flow capacity indicator.
- More time for the client to plan maintenance interventions and possibility to optimize intervention planning.
- The approach developed by Performance for Assets can be applied on other types of filtering units.