

REFERENCE

viledon®

2-IN-1 FILTRATION SYSTEM FOR ALABAMA POWER PLANT TO STOP HUMIDITY AND COALESCE RAIN DROPLETS

The power plant is located in the Morgan county in Northern Alabama, United States and operates 3 Siemens Westinghouse 501F combined cycle gas turbines. The climate is subtropical with warm, hot summers and high humidity. Alabama is rather rainy with an annual precipitation of > 1,300 mm (> 53.4 inches) and has to cope with severe thunderstorms and very heavy rain.



hydroMaxx coalescer prefilters and MVPGT cassette filters in the final filter stage

The situation

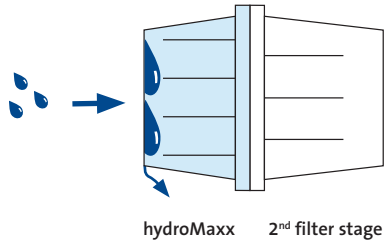
All filter systems for air intake filtration of the gas turbines were initially equipped with flat filter mats in the 1st prefiltration stage followed by V-style cassette filters in the final filter stage. This filter configuration was extremely inefficient for the following reasons:

- Due to the climate conditions of the site with heavy rain and fog the prefilter mat quickly soaked up moisture so that pressure drop increased significantly and remained at a high level.
- The prefilter mats had a lifetime of only 2 to 3 months. Filter replacement was done during operation while turbine load had to be reduced. This replacement process had a negative impact on plant safety.

The Viledon® solution

- hydroMaxx coalescer prefilters were selected for the 1st stage to ensure effective removal of moisture and water droplets.
- MVPGT 95 cassette filters in the 2nd and final stage capture the main airborne particles. These filters provide high efficiency, high dust holding capacity and robust construction.
- After installation of hydroMaxx coalescers there had been a real improvement of the site's overall pressure drop which is stable over a long period and which allows for useful filter lifetimes of > 18 months.
- Heavy rain will no longer affect the site's pressure drop development so that turbine load is not impaired.

WATER PATHWAYS WITH VILEDON HYDROMAXX IN THE 1st FILTER STAGE



No water ingress from 1st filter stage to 2nd filter stage

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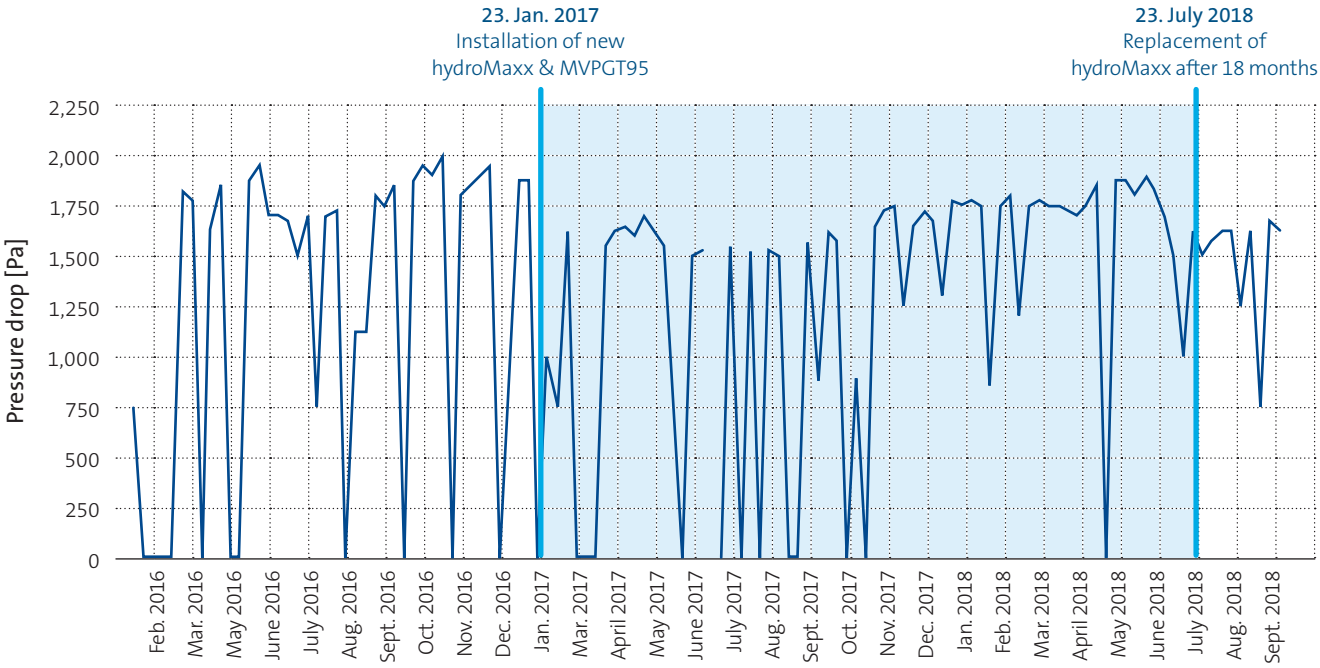
Development of pressure drop during installation of hydroMaxx prefilters



Customer benefits

- The 2-stage filtration system is ideally suited to cope with the high moisture levels and rain droplets that typify the local conditions and shows a consistently low pressure drop compared with the previous filtration system.
- Thanks to the hydroMaxx coalescer prefilters, water droplets gather together and then roll harmlessly off the filter surface. No water penetrates beyond the 1st stage.
- The 2-in-1 configuration, where-by the hydroMaxx filters are clipped onto the MVPGT filters, is very quick to install. It also saves considerable space so that there was no need for capital-intensive conversion of filter walls.
- The unique clipping system also enables easy online replacement of the hydroMaxx prefilters.
- Reliable and clean operation of the gas turbine's compressor sections minimizes fouling, corrosion and hot gas path corrosion.
- The operation regime is in line with scheduled maintenance work and eliminates unplanned downtime.
- More than 1 ½ year maintenance-free operation leads to increased plant safety.





Installed hydroMaxx coalescer prefilters – the white areas on the filters (picture above) show a kind of self-cleaning effect

KEY DATA	
Location	Alabama, USA
Gas turbines	3 Siemens Westinghouse 501 F Gas turbine 1, prefilters equipped in January 2017 and replaced in July 2018 Gas turbine 2, prefilters equipped in October 2018 Gas turbine 3, upgrade with the same filtration system planned for March 2019
Intake air flow rate per unit	1,370,252 m³/h (806,500 cfm)
Initial pressure drop (total system)	1,625 Pa (6.50 inches WC)
Intake air system / filters fitted	2-stage filter system for intake air filtration of gas turbines 1st stage: 330 hydroMaxx coalescer prefilters of filter class ISO ePM10 50 % (G 4 / MERV 8) 2nd stage: 330 MVPGT 95 cassette filters of filter class ISO ePM1 75 % (F 8 / MERV 14)

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