REFERENCE

viledon®

CONTINUOUS GAS TURBINE OPERATION DURING HEAVY SNOW FALL EVENTS

The 680 MW combined-cycle natural gas power station, which was commissioned in 2018, is located 65 miles north-west of New York City and operates two Siemens SGT6-5000F (W501F) gas turbines. The generated power is sufficient to meet the needs of more than 600,000 homes especially during peak demands such as extreme cold and heat. A climatic challenge in this region are winter snowstorms with large amounts of powdery snow.

hydroMaxx and F 45 R

The situation

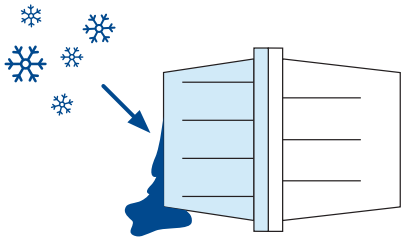
The filter systems for air intake filtration of the two gas turbines were initially equipped in the 1st filter stage with cardboard frame prefilters followed by cassette filters in the final filter stage. The prefilter configuration was extremely inefficient for the following reasons:

- During one winter storm the cardboard prefilters with 96 mm depth clogged-up with snow so that overall pressure drop increased up to 2,250 Pa (8.8 inches WC).
- As a result there was an automatic unloading and eventual shutting down of both turbines. The power plant lost a lot of revenue on a day with very high power prices.
- The prefilters with a frame material that offer no hydrophobic properties had a lifetime of only 2 to 3 months due to deterioration in performance.

The Viledon® solution

- F 45 R coalescer prefilters were selected for the 1st stage to ensure effective removal of moisture and powdery snow.
- After installation of the Viledon® coalescer prefilters a reliable and stable pressure drop of the filters was recorded though the filters had to cope with two heavy snowstorms.
- Large quantities of powder snow will no longer affect the site's pressure drop development which enables base load turbine operation even through snowstorms.

SNOW REMOVAL WITH VILEDON HYDROMAXX IN THE 1st FILTER STAGE



Due to normal vibrations of the filter wall snow falls directly off the filter onto the floor.

hydroMaxx / F 45 R **2nd filter stage**

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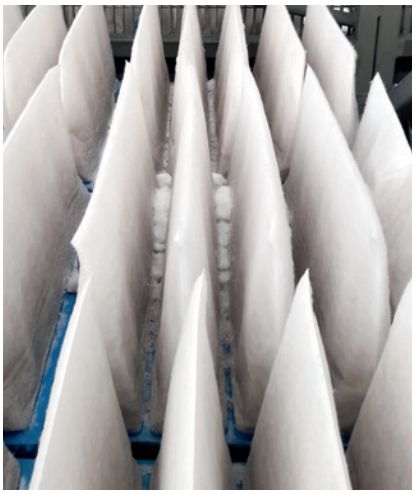
Image source: Competitive Power Ventures (CPV)



Large areas of filter pockets keep clear off snow allowing air passage (view from the floor of the filter house)

Customer benefits

- The turbines can be operated in a base load mode which allows the plant to avoid revenue loss.
- The 2-stage filtration system is ideally suited to cope with the high snow and moisture levels that typify the local conditions in wintertime, and excels in terms of low pressure drops.
- Thanks to the front of filter drainage effect of Viledon® coalescers, powdery snow rolls off the filter surface and falls onto the floor.
- No CAPEX for installing the innovative 2-in-1 filtration concept with close coupling of Viledon® F 45 R or hydroMaxx prefilter to the final filter.

The initially installed cardboard prefilters collected snow inside the pleats resulting in clogging

KEY DATA	
Location	New York State, USA
Gas turbines	2 Siemens SGT6-5000F (W501F) equipped with coalescer prefilters in January 2019
Intake air flow rate per unit	1,512,108 m^3/h (890,000 cfm)
Intake air system / filters fitted	2-stage filter system for intake air filtration of gas turbines 1st stage: 360 Coalescer prefilters of type F 45 R 2nd stage: 360 cassette filters could be kept in place with the option for replacement to Viledon® cassette filters in 2020

The Viledon® solution: snow slips off the filter pockets, gathering and melting on the floor

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