xylem
Let's Solve Water

Trial of Flygt Adaptive Mixers Shows Energy and Cost Saving

Over three months, two Flygt Adaptive Mixers were compared to two conventional mixers to understand the potential savings for council.

CASE STUDY – NEW PLYMOUTH, NEW ZEALAND

An outstanding energy reduction of 49.58% compared to the installed conventional single speed mixer.

BACKGROUND

The scope of the trial included the replacement of two existing mixers to integrate Flygt Adaptive technology into existing process to optimise energy savings and reliability.

The existing 3.5kW and 3.6kW mixers had been installed in the anoxic zone of the bioreactors. Xylem worked with New Plymouth District Council to review the most appropriate location for the trial mixers. A location was chosen that mirrored two units in the other bioreactor.

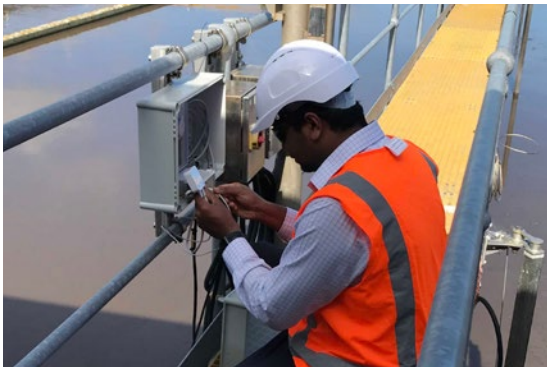
The trial Adaptive Mixer units were operated for three months under the same conditions as the existing units and comparative power usage was monitored and logged.

At the completion of the trial the data was analysed and NPDC purchased one of the trial mixers and went to market with a competitive tender to replace all 16 mixers in their bioreactors. Xylem successfully won the tender to supply mixers for both bioreactors.

SCOPE

Xylem approached New Plymouth District Council in 2019 with the idea to demonstrate its innovative Flygt Adaptive Mixing Technology. The aim of the trial was to demonstrate the significant operational savings available from energy efficiency, ease of integration and the increased reliability of the new innovative Flygt Adaptive Mixer Series versus conventional single speed mixers.

Flygt 4220 Adaptive Mixer



FLYGT

SOLUTION

Innovative Flygt Adaptive Mixers feature an industry leading submersible Flygt drive unit that offers integrated motor control and energy savings. The super premium synchronous permanent magnet motor achieves IE4 motor efficiencies, combined with optimised hydraulic design, thrust per kw is maximised. Flygt Adaptive Mixers have built in variable speed control without the need to add a traditional VFD, providing optimal flexibility without the increased maintenance, downtime or complexity. Mixer duty can be altered either manually or automatically allowing treatment plants to fully optimise operations to their needs. These enhanced capabilities of the compact Flygt Adaptive Mixers deliver unmatched value to customers.

Demands at a wastewater treatment plant change daily and unlike conventional fixed speed motors, the speed of Flygt Adaptive Mixers can easily be varied accordingly. This allows for greater flexibility and contingency at plants, a single model mixer can be used in various locations with different mixing requirements. In addition, Flygt Adaptive Mixers mean lower investment for re-build or replacement as they can be re-used in various tanks and applications. The ability to repurpose mixers can provide cost and time savings and a far greater return on investment.

Thanks to compact design and soft start motors, installation and commissioning of Flygt Adaptive Mixers is simple and intuitive.

RESULTS

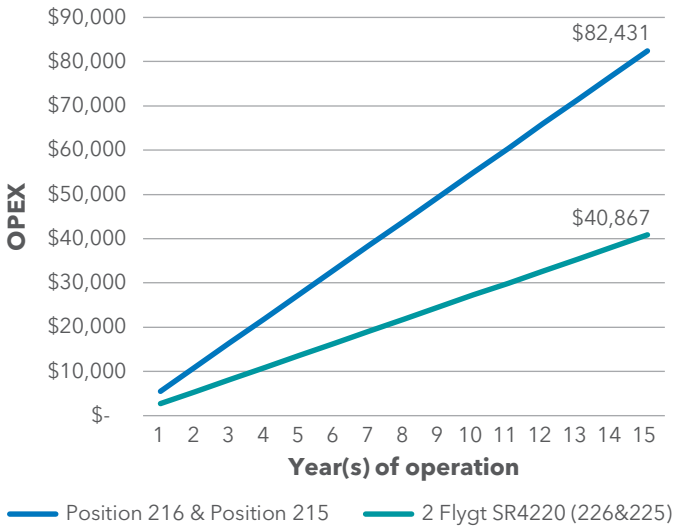
After a cooperative analysis of the current situation; Xylem Engineers used custom in house software to accurately calculate the optimal thrust required and nominate the most advantageous location to optimise bulk flow.

Xylem delivered 2 x Flygt 4220 Adaptive Mixers to New Plymouth District council wastewater treatment plant and commissioned the two units, directly mirroring positions (to allow for 100% like for like comparison) to 2 x conventional single speed mixers already installed by others.

Xylem Water Solutions worked with New Plymouth District Council to demonstrate the capabilities and benefits of the new generation of efficient mixers.

The data used for this study was gathered from the Flygt Adaptive Mixers with ease using their integrated monitoring system. Monitoring is also available for running time, drive temperature, phase loss alarm and overload alerts. Automatic de-ragging, and the ability of Flygt Adaptive Mixers to operate at only the required duty point, reducing mechanical stress allowing for an enhanced lifespan and reduced maintenance.

Overview electricity costs (OPEX) vs. Year(s) of operation



After seeing the proven savings and operational benefits firsthand, New Plymouth District Council has since replaced all their bioreactor mixers with Flygt Adaptive Mixers.

OPEX comparison and evaluation

	Mixer type	Power uptake each – As measured	Annual running costs*
Bioreactor tank # 1			
Position 216	Traditional / Fixed duty	3.5 kW	NZ$2,706
Position 215	Traditional / Fixed duty	3.6 kW	NZ$2,786
Bioreactor tank # 2			
Position 226	Flygt SR4220.010 2.2 kW	1.69 kW	NZ$1,308
Position 225	Flygt SR4220.010 2.2 kW	1.83 kW	NZ$1,416

** Running costs based on 8,600 running hours and 9 cents per kWh.*

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