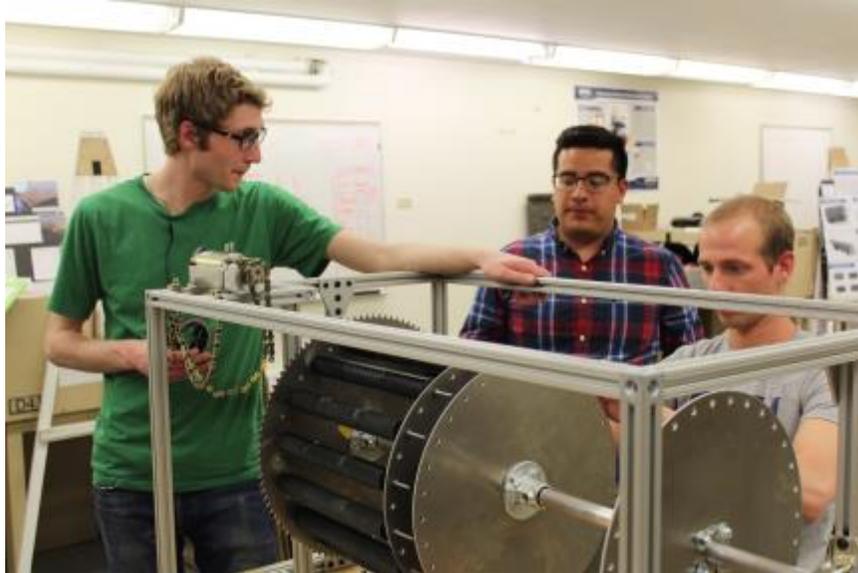


Improve Aeration Drive System

Aeration occurs in many water and wastewater treatment processes, but in the activated sludge process and its variants, it consumes more energy than other processes. Reducing energy consumption during aeration is usually the best initial step to minimize energy cost. WesTech has a technology utilizing a proprietary mixing paddle that introduces oxygen to the sludge pond in a manner similar to the when on a river boat. WesTech wanted the student team to study the aeration system and make recommendations to improve the energy consumption as well as reliability of the



The team studied the underlying causes for the failures from historic warranty data, and visited water treatment plants to perform interviews with plant managers and to measured data from the current power consumption of the aerator system. From the insights gather in the initial research, the team considered several possible solutions and concluded that the idea of modifying the rows to a staggered configuration offered the most promising results.

The resulting design at the current stage of the product development process includes an optimized angle and pattern that according to a mathematical model and a scaled prototype has shown that it will increase the reliability of the system while maintaining a similar power consumption. Therefore, the expectations from the sponsoring company were achieved and WesTech can use the design to make changes to the STM Aerotor system.

Airothec team members making final adjustments to the scaled prototype. The prototype was used to perform testing and to present a visual representation of the design to students, professors and sponsors.

YEAR

2016-2017

TEAM

27: Airotech

COACH

Yuri Hovanski

STUDENTSKevin Cheatham, Christopher Whetten, Rex Bunderson, Humberto Detrinidad,
Ricardo Meza

The design team and coach. From left to right: Rex Bunderson, Christopher Whetten, Kevin Cheatham, Ricardo Meza, and Dr. Yuri Hovanski. Not pictured: Humberto Detrinidad.



The team was able to take a complex problem and offer a solution that consisted of a simplistic approach that has proven to benefit the sponsor since it keeps costs down and improves the reliability of the system.