



Smart industrial aircraft wash system recovers 90% water

The situation

Riveer, a leader in industrial and military grade customized wash systems, recently partnered with another engineering firm to design a specialized aircraft washdown system at a military base in North America. The charge: reengineer and design an aircraft washdown system optimizing wastewater treatment and recovery, aligning with regulatory and environmental compliance standards.

After a thorough assessment of the onsite system, it was determined digitally intelligent and flexible solutions were needed to meet system requirements and provide the necessary data for compliance. Grundfos' reputation for providing quality digital products, solutions and services were an excellent fit and they were awarded the contract. The products and solutions at the minimum needed to:

1. Easily integrate and be compatible with the existing system products and chemistry being used
2. Provide real-time monitoring and feedback that can be accessed anywhere
3. Be analog input compatible
4. Be capable of identifying when the pumps lost prime or ran out of chemistry

Without a smart system in place, the operation would be required to pay significant costs and employ multiple resources to outsource the treatment of their wastewater. By using Grundfos pumps and smart solutions, the untreated water from the washdown process could be properly treated and reused, taking advantage of the digitally enhanced and automated features Grundfos products were built for.

The solution

Two Grundfos SMART Digital Dosing pumps were used for coagulant and caustic polymer. A 4-20ma analog and digital (DID) controller were used to ensure proper measurement and dosing. Digital outputs allowed for system oversight, monitoring alarm outputs, and fault or stop the system if the pumps run out of chemistry or lose prime.

In addition to passing along live pH values to the PLC, a long list of logic was built into the system for pH dropping out of range, with both soft and hard limits programmed in for optimal measurement. The system would then take more serious measures before human involvement, ensuring both systems could operate autonomously. The system was also programmed to shut down before any out-of-spec effluent was discharged to sanitary.

"While the DID is working to maintain system pH levels within acceptable ranges, our system PLC is programmed to monitor the levels from the DID and will automatically shut down the system before any out-of-spec effluent is discharged to sanitary." - Tracy Whitaker, Grundfos Senior Sales Engineer

Grundfos CM transfer pumps were used in between the dissolved air flotation system and the pH mixing tank. A Grundfos CRE pump was used for filtration and a pair of Grundfos CREs were used as backwash pumps due to the wide range of flows and pressures available.

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Possibility in every drop



When asked why these products were selected, Tracy stated “due to the autonomous nature of these systems, having intelligent pumps and controllers that can alert the system was critical. Having pumps that can throw alarms due to pump failure, loss of prime, running out of chemistry etc. was a necessity.” - Tracy Whitaker, Grundfos Senior Sales Engineer

“When it came to real-time pH monitoring and adjustment, we trusted a Grundfos solution to protect the equipment and protect the downstream sanitary line.” - Graham Blackwood, Mechanical Engineer – Riveer

This fairly complex system was made easier by using an off-the-shelf Grundfos system with customizable solutions.

The outcome

More than 90% water recovery

Using multiple Grundfos smart solutions, including variable speed motors, digital dosing, and smart sensors, the OEM and engineering teams were able to optimize the system to treat and recover over 90% of the wastewater from the aircraft washdown process while meeting all regulatory and environmental compliance standards. – Graham Blackwood, Mechanical Engineer – Riveer

Smart technology integration

This system was designed to operate autonomously allowing the individuals washing the aircraft to focus on their job without having to worry about how the water was being processed or filtrated before being released back to sanitary to be recovered.

Quality service standard set

Leading to 4 additional builds

When issues arise, Tracy and his team are just a phone call away. “Tracy is awesome. If he doesn’t have an answer, he’ll usually instantly get someone on the line immediately to get the answer for us... We have since built a total of four flocculation systems that all rely on Grundfos dosing pumps.” – Graham Blackwood, Mechanical Engineer – Riveer



Project details

Continent: North America

Country: United States

Market areas: Industry, Mobility (Military, Aviation) Applications: Wastewater, Water Recovery, iSolutions, Products: DDI, pH Sensors, flowcells, CM, CR, CME pumps

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