

## Water



### RedRaven value proposition

RedRaven is an adaptive technological platform capable of enabling IoT services for flow motion equipment and systems. It offers the water industry the scalable abilities to monitor and predict equipment failures, take preventive actions, and avoid unnecessary disruptions.

### Challenges facing the water industry

**Lack of technician resources** — You're likely operating with limited technician resources, making it difficult for your maintenance teams to monitor your equipment effectively. This becomes even more challenging if you have hundreds of pumps spread across a large area or are operating remote facilities with limited or no technical staff on-site.

**Lack of IT expertise** — Your teams are focused on moving water, not IT connectivity. Without the technical expertise to understand the intricacies of remote monitoring technology or the infrastructure (cloud, data security, etc.) required to configure and operate it, you may be hesitant to adopt new monitoring technology.

**Reactive focus** — Because resources are spread so thin, your teams are in constant "reactionary" mode, only responding to issues once things go wrong. Your technicians are trained to respond to pump problems once they show signs of an issue, not to predict problems in advance. But this means that when something goes wrong, it *really* goes wrong.

**Lack of capital** — Most water facilities are publicly funded, so you must carefully scrutinize spending to keep costs down. Unlike other industries, you don't have the luxury of capital expenditures to invest in cloud-based infrastructures or new technologies, so you have to make do with what you've got.



### Customer concerns



#### Production disruptions

If your pumps fail, you'll face severe production disruptions. This could mean potable water supply interruptions, environmental impacts or catastrophic flooding.



#### Expensive financial penalties

If your equipment fails, you could face "failure to supply" fines, expensive environmental fines or higher insurance costs.



#### Sky-high maintenance fees

If your teams aren't equipped to identify and respond to minor equipment issues as they happen, these issues could eventually lead to pump failures. And pump failures will mean expensive repairs, downtime and lost production.



#### Higher energy costs

If your pumps are not working efficiently, they're guzzling electricity, increasing your energy use, and boosting costs. Depending on what type of water facility you're operating, energy costs could comprise the majority of your expenses.

### RedRaven benefits

**Predict problems before they happen** — Your team can predict why pumps will fail and take preventive action before they cause an outage, eliminating expensive repairs, equipment downtime and water supply disruptions.

**Monitor equipment from anywhere** — Your technicians don't have to be on-site. They can monitor equipment in near/real time from anywhere. This capability means your engineers, no matter how many there are, can identify and respond to pump issues quickly, increasing pump uptime.

**Respond only when there is a problem** — Your technicians likely spend a great deal of time inspecting healthy equipment. With RedRaven, they'll work more efficiently by only focusing on those pumps which are experiencing problems.

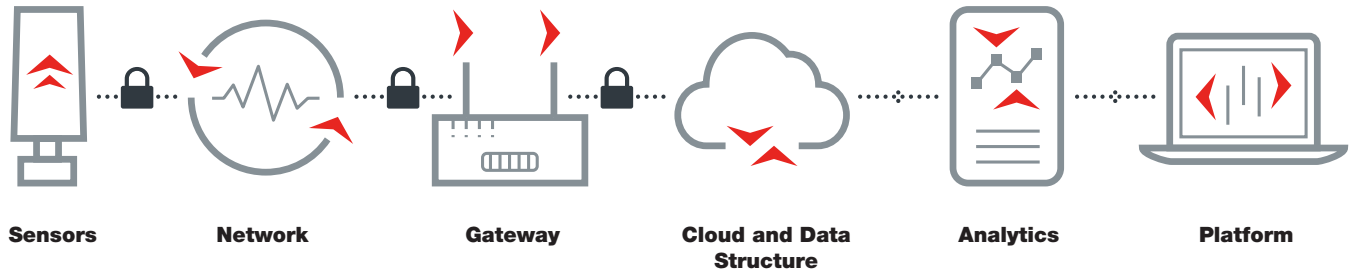
**Improve pump efficiency** — You'll get detailed insights into how your pumps are working. If they're not running efficiently, you'll know about it, so you can make adjustments to get them working properly. With your pumps running at peak efficiency, you'll spend less on energy and move more water as well.

**Reduce maintenance costs** — As a publicly funded facility, you're always looking to save costs. RedRaven can help you to reduce maintenance costs by immediately identifying the root cause of equipment problems. If you're paying technicians by the hour or hiring outside technicians to troubleshoot, you'll reduce time, labor and costs by knowing what's wrong before they even get to the pump.

**Monitor, analyze and predict using one platform** — With sensors, transmitters and analytics, RedRaven gives you everything you need to monitor, analyze and predict pump behavior and respond to pump problems. You won't have to work with different vendors or compare multiple technologies that may or may not communicate with each other. With RedRaven, you'll get everything you need in one place.

**Gain support** — The Flowserve Monitoring Center can support your team by analyzing your data and helping you to troubleshoot. We can also provide advice — based on our unmatched water industry expertise — to help you improve efficiency and productivity.

**Keep data safe** — Whether you use wired or wireless equipment monitoring sensors — from firewall and encryption technologies to strictly controlled data centers and processing systems — the RedRaven cloud infrastructure is backed by robust, world-class cybersecurity measures.



## Case study

An electromechanical engineering company in the Middle East recently used RedRaven to help its water plant customer gain better pump performance insights. Before using RedRaven, the plant was only measuring pump vibration, which provided a limited understanding of its overall pump operations.

To illustrate the benefits IoT offered the plant, the engineering company launched a pilot program that included using RedRaven to monitor a pump's (full-spectrum) vibration, water temperature, pressure and flow. Understanding all of these variables would help the plant to identify mechanical issues before they caused unplanned downtime.

The water plant benefited immediately with RedRaven. It could access pump performance data via the Flowserve portal; Flowserve also provided monthly performance reports, which showed the pump's actual efficiency compared to design efficiency. The plant could see how the pump performed in real time and review historical data in the portal to see its performance over a specific time frame.

When RedRaven indicated an increase in pump vibration, an email was automatically generated and sent to plant technicians, alerting them of a potential issue and allowing them to respond quickly.

Impressed by how RedRaven could reduce downtime by proactively alerting the plant to pump issues, the engineering company plans to introduce the technology to its other water plant customers.

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