

Water Flow Intelligence helps leading automaker reduce water usage per vehicle by 15% at a North American automotive assembly site without impacting paint pretreatment quality



BACKGROUND

One of the world's largest automakers sought to reduce its water usage per vehicle as part of a long-term goal to improve sustainability in its vehicle manufacturing processes. As a longtime strategic partner of the company, Nalco Water was asked to help identify areas for water reduction without negatively affecting quality or production.

From Nalco Water's experience in the industry, pretreatment is among the most water-intensive processes within the plant and the biggest opportunity to reduce water consumption. The pretreatment area prepares vehicle bodies for painting using multiple chemical baths and water-rinse stages.

Water balance in the pretreatment area is typically managed manually with minimal

visibility to actual water usage. The plant did not have meters in most locations, and the few available meters were rarely checked. Some meters were linked to the local data management system, but the data was rarely reviewed much less used to drive water-savings action.

Overflows are used to maintain target chemistry concentrations in each stage, with water rinses used to prepare for the next stage. As vehicle bodies move from stage to stage, some stage water carries over to the next stage; the tanks are rebalanced with overflows. Without water flow visibility, it's difficult to run stages at optimal performance.

Even in areas with water meters, the optimal flow rate was never determined so changes to flow rarely happened and water was often overused.

ANNUAL SAVINGS



WATER

Reduced water usage by
25 million gallons
annually



PRODUCTIVITY

Real-time insights helped the plant
make better, faster decisions
to improve water balance

VALUE DELIVERED

\$193,000
ANNUALLY

SOLUTION

Nalco Water responded with Water Flow Intelligence, a digitally enabled program that uses real-time flow monitoring to help better manage water balance. Data and insights from impactful locations are sent to a secure cloud-based portal, allowing visibility and triggering alerts when water flow rates exceed prescribed limits. Real-time monitoring and smart alarms allow leaks and overuse to be identified and addressed quickly. The program was installed at one of the automaker's North American plants to demonstrate its capabilities.

Over time, the data collected by Water Flow Intelligence also allowed the site to set benchmark flows. Placards were placed by flowmeters, displaying target flow rates so adjustments could be made if the flow was outside of range, optimizing water usage while also ensuring enough water was used to maintain performance. For instance, the rinse stages were supposed to use 50 gallons per minute (gpm) of water flow to ensure full rinse of the vehicle before the ECoat bath. Without the flowmeters, flow rates varied greatly based solely on the operators' judgement.

In another example, Water Flow Intelligence's smart alarming capabilities and the ECOLAB3D™ digital platform identified excessive water use in the phosphate area - more than 91,000 gallons. These alarms prompted the on-site team to investigate. The Nalco Water team identified the boiler blowdown as the source of the overuse and quickly fixed the issue.

Without Water Flow Intelligence, this type of leak would have gone undetected for months, until the excess usage was represented on a quarterly water bill. However, the utility bill captures water usage for the entire plant, so even then, the plant had no way to track the overage to the source. Once the leak was repaired, usage in the following month was 300 gallons, confirming the leak had been fixed. Now, the plant uses Water Flow Intelligence to ensure the gains are maintained year over year.

During a COVID-19-related plant shutdown, the Water Flow Intelligence program detected 20 gpm usage in an area of the plant that was not operational. The Nalco Water and customer teams worked together to find a valve that was left on and closed it in a timely manner.

RESULTS

In this dynamic system, continuous real-time visibility and support have enabled optimization of assets and allowed the plant to leverage best practices to improve performance across all respective water systems. Water Flow Intelligence has helped the site achieve a 15% reduction in water usage per vehicle, resulting in 25 million gallons of water per year and more than \$190,000 in savings.

Reducing water consumption in production processes correlates directly with a decrease in the volume of water passing through the site's wastewater treatment plant. However,

as a result, these streams can be more concentrated. Nalco Water also manages the wastewater treatment plant, so the team monitors and modifies the treatment program as needed to maintain environmental compliance.

CONCLUSION

The Water Flow Intelligence program has raised awareness across the site regarding optimal water usage, helped identify when and where water is being overused, and empowered the local plant team to take corrective action. The plant has been commended as an example of how Water Flow Intelligence can help the automaker's enterprise and established a new standard. In the months since, the program has been implemented for benchmarking, alarm management and improvement validation at 10 additional sites with similar results.

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