

Expert response helps Electric Vehicle manufacturer avoid downtime after contaminated wastewater incident



BACKGROUND

Substantial growth in the electric vehicle market has stressed the manufacturing labor force and the ability for sites to hire and train qualified operators throughout assembly plants including pretreatment, paint and wastewater treatment systems.

The electric vehicle manufacturer's site operational goals were to maintain paint shop productivity targets, with less than 6 hours of downtime per month. To achieve this operational goal and maintain regulatory compliance, required flexible and reliable vehicle pretreatment, paint and wastewater systems.

An accidental oversight of an open valve released an Ecoat bath into the wastewater treatment (WWT) plant contaminating the WWT batch tanks and caused damage to piping and equipment. This incident threatened to cause a loss of productivity and noncompliance. The release happened during scheduled shutdown, but quick action and water treatment expertise was required to not delay the restart and disrupt production goals. The quick action also avoided fines

or further shutdown from a potential permit violation.

SITUATION

The customer wanted to address the current problem as well as avoid future risk to regulatory compliance, expensive loss of chemistry, equipment damage and downtime through developing an improved process. Their goal was to reduce these risks at the site level via improved engineering, clear processes, training, monitoring and alarming. Additionally, they wanted increased visibility for corporate Environmental Health and Safety management.

The incident occurred during a scheduled downtime, over a long-weekend night shift. A valve was accidentally left open during a cleaning and the Ecoat solution was released from its tank and drained into the WWT plant. The WWT plant has batch tanks to receive waste from the entire plant. The release caused the Ecoat to mix with a higher pH waste stream, this resulted in the entire solution solidifying and blocking roto strainers and backing up the system. The solidified material caused damage to the pumps, piping and other equipment throughout the WWT system.

SAVINGS



WASTE

Prevented

500 tons

of solid waste generation

**600,000
gallons**

(2,270 m³)

of liquid waste processed onsite in total, saving

US\$355,000



ASSETS

Prevented a replacement and temporary rental spend of

US\$2.7M



PRODUCTIVITY

36

hours of downtime saved

VALUE DELIVERED

Total Cost Savings

US\$3.05M

SOLUTION

The on-site paint booth managed operations team, Abednego, a Nalco Water company, started by helping the customer troubleshoot the current situation. With the large influx of waste flowing to the WWT plant, some batch tanks overflowed. The Nalco Water and managed operations teams were able to stop transfers until room was cleared and able to take additional wastewater. The team successfully managed the WWT to continue operations as scheduled.

In parallel, the Nalco Water team worked with the customer to gain an understanding of their priorities for the system and began developing a turnkey solution that would help prevent similar incidents. The solution included: equipment improvements, Standard Operating Procedures (SOPs), monitoring, alarming, and preventative maintenance (back-up motors, pumps, etc.) provided by the Abednego Managed Operations team.

First, Nalco Water brought in the industrial technical consultants (ITCs), with decades of automotive experience in Ecoat and wastewater, to provide short-term guidance and get systems back in compliance and available to continue to treat waste from the rest of the plant.

The emergency adjustments to handle the contaminated water saved several assets from severe damage and allowed those assets to be rebuilt rather than fully replaced. This saved the customer US\$1,200,000 of equipment loss and US\$1,500,000 in equipment rental that would be required due to the long lead time to replace a clarifier.

Initially, the plan was to truck the contaminated wastewater off site to treat, but Nalco Water implemented a combined chemistry and engineering solution that allowed the customer to treat the contaminated waste onsite and eliminated wastewater removal costs. This approach saved the customer approximately US\$240,000.

Nalco Water also changed the standard chemistry and treatment strategy, reducing the sludge that was generated by half the normal amount. This adjustment saved the customer US\$65,000 in sludge-hauling and US\$50,000 in sludge disposal costs.

Nalco Water then worked with the customer's team to build and manage an operational strategy that could handle the waste and clean the unit operations to successfully handle wastewater again.

To address the customer's long-term goals, that included improving safety, compliance and reliability, the Nalco Water ITCs, Managed operations teams, and automotive water experts

worked together to establish a new operating procedure. The plan included recommendations that promoted safety, consistency and risk reduction:

- Recommended new lights to improve visibility in the area where the incident occurred.
- Improved labeling of valves, pipes and other equipment.
- Implemented a lock-out, tag-out procedure to reduce safety risks.
- Permanently changed to the improved chemistry program to reduce sludge
- Implemented an Ecoat emergency response plan
- Wrote SOPs, roles and responsibility documentation and training to improve the WWT operations. Informed by their combined Nalco Water expertise, the SOPs and program included maintenance, cleaning and replacement schedules with spare parts on hand to reduce the likelihood of future contamination events.
- Committed to implementing the program through a turn-key managed operations program run by the Abednego experts.
- Recommended implementing, Water Flow Intelligence, digitally-enabled monitoring and alarming system on key flows to help quickly identify potential leaks or valves that are inadvertently left open.

CONCLUSION

Nalco Water's expertise and experience in water throughout an automotive assembly plant helped the site safely address the major contamination incident. This allowed the restart production on-time, saving 36 hours of down time, and saved a significant volume of waste from going to a landfill.

The continued partnership with Nalco Water and the managed operations teams will help ensure the site's long-term goals are met. The new programs will help improve safety, reliability and reduce risk of another incident.

For the customer, partnering with Nalco Water helps create a best practice

SOP with improved visibility providing a safe, responsible and reliable water system. For the employees, surrounding community and shareholders this helps instill trust in the customer as they continue to deliver on their brand promise of being a sustainable company.

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