



Advanced FLOCMaster Technology Improves Sustainability Performance and Reduces Waste Treatment Operating Costs at a Major Food Processing Plant in Northern Europe



INTRODUCTION

A major global manufacturer of food products operates a large number of production facilities around the world. The company makes a very strong commitment to Corporate Social Responsibility (CSR), including strict adherence to its sustainability goals, and publishes progress in its annual CSR Report. The company ensures that all manufacturing operations are accredited to the Environmental Management Systems standard ISO 14001, and has specific programs in place to reduce the consumption of natural resources, and the creation of waste. In addition to these ongoing sustainability commitments, European and local legislation, including the Integrated Pollution Prevention & Control (IPPC) regulations, are

putting increasing pressure on all manufacturing companies to lower their consumption of natural resources, and to reduce associated emissions and waste. Commercial pressures are ever present and continue to drive reductions in cost.

BACKGROUND

The company operates a food processing plant in the north of Europe. Management at the plant are very focused on staff safety, minimisation of resource use, and overall production cost-efficiency. To assure this, the company expects the best on-site expertise from its supplier partners, innovation in new technologies, and improved sustainability performance

CUSTOMER IMPACT

Reduction in fresh water demand of over 950k gallons (4,200 m³) (85%) per year through polymer makeup efficiency

Increase in dewatering performance delivered a 15% increase in sludge cake dryness, reducing off-site sludge disposal by 1,642,427 lbs (745 tonnes) (13%) per year

Reduction in consumables of 3,858 lbs (>1,750 kg) (up to 20%) through use of new application technology

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ECONOMIC RESULTS



Reduction in fresh water costs of \$5,605 (€4,200) (85%) per year



Reduction in sludge disposal costs of \$42,708 (€32,000) per year, and also associated trucking operations and emissions

Overall reduction in the Total Cost of Operation (TCO) of over \$48,047 (€36,000) per year

eROI is our exponential value: the combined outcomes of improved performance, operational efficiency and sustainable impact delivered through our services and programs.

through better water, energy, and waste management. In particular, management were looking for new ways to improve the cost-efficiency of the waste treatment plant on site.

CURRENT SITUATION

The waste treatment plant receives a wastewater flow of around 1500 m³ per day, mostly consisting of processed food wastes and cleaning fluids. The flow is treated using two treatment systems which run in parallel. The first consists of primary treatment, anaerobic digestion, and then sludge treatment. The second consists of primary treatment, anaerobic and then aerobic treatment, followed by dewatering of sludge using a centrifuge. The dewatered sludge is disposed of off-site, and the centrate is returned back to the aerobic treatment. It is this part of the overall treatment system which was of interest to management in identifying any potential cost reductions.

The dewatered solids amount to 1.5 tons dry material per day, the actual sludge cake having between 6-10% dry solids: the external disposal contractor is paid €42.50 per wet tonne of material.

Nalco Water was already supplying a treatment program for the customer on this second line, applying chemistry to both the centrifuge and to the secondary clarifier. There was a single shared polymer solution makeup system for the two applications, using a two-step dilution system. In Step One neat polymer was diluted with fresh water to make a solution of approximately 0.2%

concentration. In Step Two, a variable amount of this solution was taken and mixed in-line with fresh water and then pumped to the centrifuge.

WHAT WERE THE COMPANY'S GOALS?

Key Performance Indicators (KPIs) for the customer included:

- Safe operation
- Water use reduction
- Consistent asset reliability and availability
- Reduction in the Total Cost of Operation
- Improved sustainability performance
- On-site support
- Outstanding supplier performance

Nalco Water was asked by the customer to identify any new opportunities to better achieve the stated KPIs that might now be available with the recent advent of new and advanced treatment and application technologies.

ACTION PLAN

Nalco Water reviewed all aspects of treatment plant operation, especially the centrifuge, to identify areas for improvement which would positively impact upon the customer's stated KPIs. The centrifuge was quickly identified as a potential application for the new Nalco Water FLOCMaster technology for dewatering applications. FLOCMaster Technology consists of a unique make-up station which

delivers an active polymer solution at a higher solution strength than previously possible for the chemistry required, an innovative and advanced sludge-polymer solution mixing system, and an automation component that optimizes the dosage of polymer solution. The Nalco Water proposal for this latest application technology to improve dewatering performance was accepted by the customer, and was installed to treat sludge fed to the centrifuge system.

RESULTS

By introducing a better level of enhanced polymer mixing, the Nalco Water FLOCMaster Technology proved capable of improving the dewatering of the sludge, which translated into important savings in sludge disposal volume and cost. Additionally, the system allowed the customer to reduce fresh water usage in the plant through reduced dilution of the polymer during makeup. Due to the optimized sludge-polymer mixing, and dosage based on sludge flow, polymer usage was reduced providing further savings and performance efficiency.

The fact that the polymer dosage was now automated and fed based on incoming sludge flow, resulted in the smoother operation of the centrifuge. Together with the enhanced mixing, polymer use could be reduced by an average of 15 to 20% delivering an annual reduction of 3,858 lb (>1750 kg) in treatment consumables.

Mixing of sludge and polymer was enhanced, which resulted in improved performance of the centrifuge ,

increased cake dryness, and reduced sludge volume for off-site disposal. Cake dryness increased by an average of 15%. Annual sludge disposal was reduced by 1,642,427 lbs (745 wet tonne)s per year (13%) with a cost reduction of \$42,708 (€32,000) per year.

The ability to use a much increased polymer solution strength resulted in a 85% decrease in use of fresh water, delivering annual savings in fresh water of 950k gal (>4,200 m³) and a cost reduction of \$5,628 (>€4,200) per year.



CONCLUSION

As a result of using the new Nalco Water FLOCMaster Technology for dewatering optimisation, the sustainability performance of the centrifuge and wider waste treatment plant were improved, in particular through reduced demand for treatment consumables and clean water resources, and through reduced sludge volumes. The combination of the Nalco Water problem-solving approach, on-site expertise, and

the application of new innovative technology, delivered improvements in sustainability performance and production continuity. The customer was now able to monitor and improve the reliability of key strategic assets whilst optimising water use and reducing costs.

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