

# Energy and equipment savings at the Svenljunga sewage treatment plant

A case study from Emotron





Johan Arvidsson, electrician at the Svenljunga sewage treatment plant, supervising an excentre pump pumping sludge to a thickener. The pump is controlled by an Emotron FDU variable speed drive. An Emotron M20 shaft power monitor ensures nothing is blocking the screw conveyor. "One advantage of Emotron products is that they can withstand harsh environments and be located within the plant, without the need for costly cables or cabinets."

**This municipal sewage treatment plant in Svenljunga, Sweden, uses Emotron variable speed drives and softstarters to control pumps, blowers and mixers, and Emotron shaft power monitors to protect equipment. The result is more reliable control, lower energy consumption and reduced wear.**

#### **Renovation leads to better efficiency**

When the sewage treatment plant in Svenljunga, a community of 10,000 inhabitants, was renovated in the summer of 2005, investments were made in order to increase operational efficiency and reliability.

"We used to regulate most of the equipment manually, but today everything is controlled by Emotron products," says electrician Johan Arvidsson.

The whole plant is now managed by one operator, instead of the two or three that used to be required for daily control and supervision. Time has been freed up for preventive measures and maintenance.

#### **Constant flow despite varying demand**

In a sewage treatment plant, the objective is to keep a constant flow despite the large variation in load during the day and night. In Svenljunga, Emotron products ensure efficient operation continuously adjusted to demand.

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*Cover picture: The Svenljunga municipal sewage treatment plant has achieved better efficiency and greater reliability by controlling their equipment using Emotron products.*

Variable speed drives and softstarters regulate pumps, blowers and mixers, and shaft power monitors protect screw conveyors.

"One advantage of Emotron products is that they can withstand harsh environments and be located within the plant," says Johan Arvidsson. "No costly cabling or cabinets are required."

#### **Unique functionality protects the equipment**

The Emotron products react immediately to deviations and send a warning or stop the process if operation is not optimal, for example if a pipe is blocked or a valve is not fully opened. The operator can take action quickly in order to prevent damage and downtime. Common and costly problems such as cavitation and dry-running can be avoided.

The stop sequence is a critical moment in pump operation, often causing stress on pipes, valves and other equipment. The Emotron solution offers soft stops by gradually reducing the pump speed, thereby avoiding water hammer and other potential damage.

#### **Total of 17 variable speed drives**

A total of 17 Emotron FDU variable speed drives are installed in the plant. They control, among other things, three inlet pumps that pump in untreated sewage water. Two of the pumps are normally used to handle overflow water, i.e. water that is allowed to pass the plant after only limited treatment, for example in the case of heavy

rainfall. The flow must not exceed 220 m<sup>3</sup>/hour in order for the particles that are to be removed to have time to settle to the bottom and not run out with the water. If the flow is too high, the system regulates this by starting the third pump to pump water past so that the particles can settle.

### Reduced energy consumption and wear

The operation of the blowers supplying oxygen to the sewage water was also made more efficient by installing Emotron FDU variable speed drives.

“Until now the blowers were either running at maximum speed or standing still,” says Johan Arvidsson. “That was wasting energy.”

The Emotron FDU now continuously adjusts to demand, ensuring that the water maintains the correct oxygen



Regulating the blowers using Emotron variable speed drives has reduced energy consumption and equipment wear. On the right Johan Arvidsson and on the left Peder Wale, salesman at Emotron.

content. Energy consumption and equipment wear are minimized.

### Shaft power monitors protect sludge scrapers

The sludge scrapers in the sedimentation basins are monitored by Emotron M20 shaft power monitors. The monitors send a warning or stop the process if operation is not optimal, for example if a scraper is blocked, a blade is worn or a chain is broken. Equipment wear and



The sludge is dewatered in centrifuges, the screw conveyors for which are controlled by seven Emotron MSF softstarters. The sludge is then used as fertiliser or sent for final disposal.



The equipment at the Svenljunga sewage treatment plant used to be controlled manually to a large extent. Today everything is regulated by Emotron products, such as these inlet pumps.

downtime are minimized. The monitors are connected to the motor cable. No sensors are required.

### More efficient sludge treatment

Emotron FDU variable speed drives control the sludge pumps that pump out surplus sludge from the basins. The FDU units are located in cabinets out by the basins.

An excentre screw pump that pumps sludge to a thickener is also controlled by an Emotron FDU. An Emotron M20 shaft power monitor monitors the screw conveyor and sends a warning or stops the process if a blockage occurs.

Mixers placed down in the basins are regulated by Emotron FDUs, as are the sludge pumps that pump sludge to centrifuges where it is dewatered. Seven Emotron MSF softstarters control the screw conveyors for the centrifuges. The sludge is used as fertiliser or sent for final disposal.

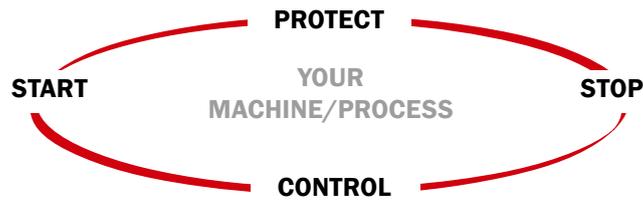
### Local industry builds own sewage treatment plant

As Svenljunga sewage treatment plant was being renovated, the largest local industry, Elmo Leather, built their own plant next to the municipal plant. The sewage water from the tannery had been putting high demands on its capacity.

“Now our plant is rated at 3000 pe<sup>1</sup>, compared to the 100,000 pe required to treat the sewage from Elmo Leather,” says Johan Arvidsson.

1) pe: population equivalent. Average discharge of organic contaminants per person per day, i.e. the amount of oxygen required to clean the water.

# A dedicated product portfolio



Emotron's product portfolio meets all levels of need for machines and processes driven by electrical motors. You will always find the optimum solution for your specific situation. When choosing Emotron, you will also benefit from cost-efficient installation and commissioning

through built-in functionality that is otherwise provided by additional equipment. You will also find intuitive user and process interfaces with the possibility of communicating critical parameters to other parts of your process, using analogue, digital, serial or fieldbus communication.

## PROTECT



### Emotron Shaft Power Monitors

when you wish to protect your application from over- and underload situations

## START • PROTECT • CONTROL • STOP



### Emotron Variable Speed Drives

#### Emotron Compact Drives

when you wish to protect your application from over- and underload situations, optimize the start and stop sequences of your application, as well as be in full control of your process values – flow, pressure, speed, torque, etc.

## START • PROTECT • STOP



### Emotron Softstarters

when you wish to protect your application from over- and underload situations, as well as to optimize the start and stop sequences of your application



## Dedicated drive

Emotron focuses on solutions for starting, protecting, controlling and stopping machines and processes driven by electric motors.

Our drive is to create measurable benefits for our customers and their customers to achieve their and our business goals, thus creating a win-win relationship for all parties involved with Emotron.

We have been developing our product portfolio during over 30 years towards carefully selected applications.

As a result we have built up specialist competence and can therefore offer our customers the optimum solution for their specific application needs.

Emotron is a Swedish company with manufacturing and development resources in Helsingborg, Sweden and in Bladel, the Netherlands. We have sales and service organisations in Sweden, Benelux and Germany, offices in China and Latin America, as well as a global network of distributors and service partners.



**DEDICATED DRIVE**

Emotron AB, PO Box 222 25 , SE-250 24 Helsingborg, Sweden

Phone: +46 42 16 99 00, Fax: +46 42 16 99 49

[www.emotron.com](http://www.emotron.com)

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