VOITH

# Waste-to-energy plant relies on compact steam turbine controller TurCon DTc

# The TurCon DTc at Norwegian energy supplier Lyse has now been in operation for more than a year

**Besides providing it with a digital steam turbine controller at an affordable price it was the TurCon DTc itself, the competent consulting as well as the custom-tailored on-site training by Voith that convinced the client.**

Finn Otto Tveit, control systems engineer, managed the project on behalf of Lyse.

With its innovative technologies, Lyse is not only an important member of the EU-funded smart city project Triangulum in the city of Stavanger. The Norwegian company also owns and operates a steam turbine. This turbine drives a generator. The thermal energy generated by the incineration of waste is converted into electricity and district heating that the customers utilize for heating systems and hot tap water. Stavanger is considered the energy capital of Europe and holds the European status as one of the nine smart city lighthouses across the continent.

Lyse had previously used a Woodward 505 steam turbine controller in conjunction with an analog Voith CTp position controller and a Voith Way Valve EKU, produced until the beginning of the 2000s, without integrated position control. The original Way Valve EKU from Voith in the control system was delivered together with the turbine in 2002. However, some components were discontinued in the CTp position controller, which could result in no repair being possible in the case of a defect. Therefore Lyse opted not only for the modern TurCon DTc digital steam turbine controller as a replacement for the Woodward controller, but also for a modern Way Valve WSR with integrated position controller as a replacement for the old EKU.

A Way Valve is a servo valve with an integrated position controller. The Way Valve directly regulates the hydraulic cylinder that actuates the control valve. The benefit of the conversion to the modern Way Valve WSR with integrated position control towards the previous Way Valve EKU without integrated position controller was that all mechanical and electrical components are contained in one unit. Lyse was also looking for an affordable yet reliable state-of-the-art steam turbine controller. On-site Voith engineers had previously created a modernization plan based on data such as the number of inputs and outputs of the old turbine control system and a P&ID diagram. That and a demonstration with the TurCon DTc sample case convinced Lyse to go for the feasibility of a complete Voith solution. The sample case contains a TurCon DTc and offers the possibility to simulate a steam turbine control system.


Thanks to the new digital TurCon DTc turbine controller, Lyse's system is working smoothly again.

# Training and installation

From the very beginning of the project engineers of Voith were in constant exchange of information with Lyse. Step by step, the temporary solution of Lyse was transformed to a highly reliable and long-term solution meeting all the company's needs.

Voith worked on-site with main contractor OneCo which was to install the system. As Lyse and OneCo needed training to manage the installation themselves, Voith experts travelled from Crailsheim, Germany, to Lyse in Norway. There the local trainees could practice with the TurCon DTc sample case under the monitoring of Voith engineers, while they were simultaneously configuring and setting up the TurCon DTc.

# Full-service provided by Voith

Lyse's project manager Finn Otto Tveit: "The Voith system totally fulfills our requirements. The full-service on-site configuration and training for us and OneCo provided by Voith worked out just fine. The implementation training was held on-site at Lyse which saved a lot of time and costs." Using the TurCon DTc sample case, Voith configured Lyse's control program and provided further training to help the staff manage the seamless implementation.

Simon Turnbull, Voith sales engineer in England and project manager, says: "We are very happy to be part of this sustainable and innovative waste-to-energy project. Thanks to the integrated complete Voith steam turbine control system and the installation by OneCo, I am sure Lyse will contribute even more to the leading role as an energy supplier of the whole region."

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A pre-simulation of the steam turbine control system using the TurCon DTc sample case enabled a quick commissioning.

# Smooth operation with TurCon DTc

Since July 2016 Lyse's steam turbine has been running with Voith upgraded components. The TurCon DTc enables the energy supplier to operate continuously and offers the whole district the highest reliability with regard to both sustainable energy production and productivity in the era of the Internet of Things (IoT).

Lyse's project manager Finn Otto Tveit, control systems engineer, explains: "Thanks to the state-of-the-art TurCon DTc digital steam turbine controller and the great on-site services provided by Voith our system is working smoothly again. At Lyse, the high reliability of our systems is an important part of the innovative services we offer the Stavanger region. The new Voith solution efficiently contributes to offering our services for decades to come."

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