VHT VAN HALTEREN TECHNOLOGIES

Power without compromise

A system to generate and sustain significant force

Ship lock complex Eefde, also known as 'the gate of Twente', sees more than 60 million tons of cargo pass through it every year, as vessels transport cargo between the major ports of Europe. As the number of ships increased, waiting times started to rise, so the decision was made to build a second lock. To ensure efficient operation, ship lock Eefde needed an energy efficient, reliable actuator system to effectively control the water gates. Hollandia, the contractor, looked to VHT for engineering expertise.

The drive system is an essential part of any ship lock, as this controls the gates which, in turn, control the water levels and flow of ships. There are a number of different types of actuators available, and choosing the right one for a specific purpose is important. For Ship lock Eefde, the actuators have to be able to control the large gates of the second lock. This means the system needs to generate and sustain significant force, to be able to smoothly open and close gates in a controlled way.

VHT has built a reputation around drive and control systems for civil use, so Hollandia came to VHT looking for a solution. The consortium Lock-2-Twente suggested that they may want to look at an electro-mechanical actuator, but after looking at the scope VHT knew that it needed to offer a system based on electro-hydraulic actuators, or EHA's.

Electro-mechanical actuators (EMA's) are useful in many applications, but for this project and the forces required, the technology doesn't yet exist. EHA's can not only provide the necessary force, but VHT can also provide systems which are more resilient when it comes to impact damage.

EMA's are becoming more popular, and some can be more wary of hydraulic systems because they associate hydraulics with extensive pipework and excessive amounts of oil, but the EHA offering is different. The footprint and build-in dimensions aren't much bigger than that of an EMA, but the force generated can be significantly greater, which is exactly what this project needed. There are no huge amounts of oil either – only the minimum amount is used, and this is sealed in the actuator itself. This means the oil is protected from contaminants, and will last for the lifetime of the equipment.

Immediate results

An EHA from VHT is not only a highly efficient option, but also a more cost effective one. With alternative hydraulic systems, a lot of preliminary work must be carried out, like laying the pipework to carry fluids, and installing housing for both power supply and oil. This can involve days, if not weeks, of preparation, which is extremely costly and can lead to delays. With the VHT solution, the installation process is much easier. It's a plug-and-run system. This system was operational within one hour after installation.

This not only brings down the cost of the project in its entirety, but it also shows what's possible with modern hydraulic systems. There's also an environmental cost to consider. As the installation time is lower with VHT, and there's not the same requirements around changing infrastructure, the overall carbon footprint is considerably lower. Every business is looking to reduce emissions, and VHT technology can help contribute to that. However, low-cost installation would mean nothing without efficiency and reliability, but this is where the VHT expertise really shines.

Future proof

One of the reasons for an EHA, aside from the power requirements, is that they are more robust than the mechanical counterparts. As there are so many ships which will be navigating through the new lock, the chances of impact against the actuator are higher. With a mechanical solution, any impact could cause the gates to be locked in place due to failure, but with the hydraulic system, operation can continue thanks to a pressure relief valve. There are a number of other features included which are designed to ensure that any unscheduled downtime is kept to an absolute minimum.

The sensors in the system are monitoring the condition of the equipment, and they're also able to detect trends with regards to speed and force. They also send information for a long-term perspective, which can contribute to the data needed to be able to offer more effective predictive maintenance.

The lock is fully operational since 2020, and the cooperation between VHT and the team responsible for Ship Lock Eefde will be working together for a long time to come.

The system is built to last, and the EHA's have a predicted lifecycle of 25 years, with the oil lasting for the entirety of that time. The job is to provide technology which always works as it needs to and keep the customer satisfied.