

# Damcos ESD block increases safety and performance of valve remote control system for LNG Carriers

## RESULTS

- Reduced risk of oil escaping from the accumulator
- Improved safety through increased ESD reliability
- Reduced ESD installation and operating costs



## APPLICATION

Maintaining reliable operation of valve remote control system onboard LNG carriers.

## CHALLENGE

LNG carriers that transport LNG (Liquefied Natural Gas) at  $-163^{\circ}\text{C}$  in its liquid phase are regarded as one of the most sophisticated vessels to build. Safety is critical to all operators and systems must be arranged to prevent dangerous situations that might lead to extreme cooling or even an explosion. Despite ship builders being under continued pressure to reduce build costs there cannot be any compromise in terms of quality or reliability of equipment. Cryogenic applications present the most demanding application for Marine Tank Management systems. This especially applies to valve control systems, which must be specifically designed for the cryogenic environment. If the valve remote control system stops working due to a loss of pressure, dangerous situations can arise. To prevent this, an accumulator – also known as an Emergency Shutdown (ESD) system - is built into the valve remote control system. This releases pressure into the system when an emergency situation occurs to ensure that the ESD valves can be reliably closed in less than 30 seconds.

To ensure the ESD system will operate when an emergency situation arises, the system must be regularly checked and tested. This involves:

- Checking pre-charge pressure of accumulators
- Verifying that directional flow control valves will operate during an emergency operation
- Checking ESD system piping and fittings for leakages

An issue can arise if there is a loss of pressure in the accumulator caused by damaged pipelines, solenoid valves or connections or a loss of power. Also, because traditional ESD systems only use a single pipe for return pressure there is a risk of hydraulic oil leaking should there be a rise in pressure caused by a temperature drop, changed valve load or increased back-pressure. This loss of oil can prevent the ESD from operating when required.

“there cannot be any compromise in terms of quality or reliability of equipment”

### SOLUTION

Emerson offers a customised valve remote control system incorporating a patented Damcos ESD control block system that provides an additional level of reliability and safety for LNG carrier applications. The Damcos ESD system incorporates a dual return pipe system that minimises return pressure and when combined with the Damcos control block this prevents the hydraulic oil from ever escaping from the system.

The Damcos block system is designed as a standard control block for mounting on two-line actuators. It can be mounted on or close to the actuators and have pilot operated check valve, relief and throttle valve, and hand pump quick connections.

Globe valves requiring linear actuators are typically specified for cryogenic applications. Emerson's Damcos KC double acting linear actuators include a built-in device for maintaining pressure even when there are significant temperature variations. With the Damcos KC actuators the moving speed of the valve can be set very accurately and even correct closing times can be met. It removes the risk of damaging the valve compare to actuators with hydromotor with unpredictable start output torques.

The Damcos KC actuators also have a lock function that secure the Globe valve locked in its position, whenever the valve is not moving. The lock is secured by a soft-seated Double Pilot Operated Non Return valve. This makes them ideal for marine applications.

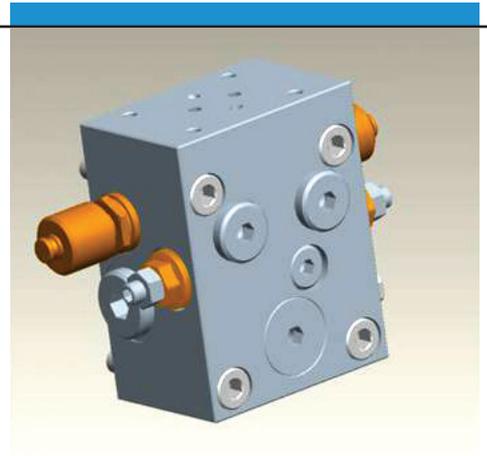
Damcos KC linear actuator use oil less than worm gear actuators that are often used with traditional ESD systems. This enables a reduction in running costs. Smaller pipe diameters are therefore required, making installation quicker and easier, along with a smaller accumulator, reducing the overall installation cost.

As part of the marine tank management solution for LNG carriers Emerson technologies provided systems included:

- Valve remote control system
- Cargo Report System (CRS)
- Rosemount TankRadar™ CTS
- Rosemount TankRadar™ OFC

Emerson Process Management

Marine Tank Management  
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