

The Optimal Valve for Tank Protection

Worldwide, the storage of crude oil, petrol and other refinery products in stationary tank farms is getting more and more important. Investments in storage tanks are increasing for several years. The biggest trend today is the increasing of storage volumes.

Based on the hazard potential to people and inventory, as well as fatal accidents in the past (like the fire in the Bruncefield tank farm in 2005. It started with a 40-minute uncontrolled overfilling and an explosion. The resulting fire could not be extinguished for over 32 hours), the reliability, durability as well as the functionality of safety systems, like shut off valves are one of the most important points nowa-days.

Tank storage safety systems

Generally, two safety systems are installed. On the one hand, every input and output pipeline is protected by an Emergency Shut Down valve (ESD-Valve). These valves are mounted in addition to the control valves, directly mounted on the tank (shown in Figure 2).



Figure 2: Triple excentric butterfly valve ZWICK TRI-CON used as ESD-Valve on a storage tank in Scotland

In the case of emergency these valves are isolating the tank from the piping system. Therefore, hazards like fires are located to small areas of the tank farm and are easier controllable.

One of the most important properties of these valves is the stroking time to close the valve. These valves must be completely closed in less than one second. Therefore, these valves are usually controlled by an electrohydraulic or pneumatic actuator.

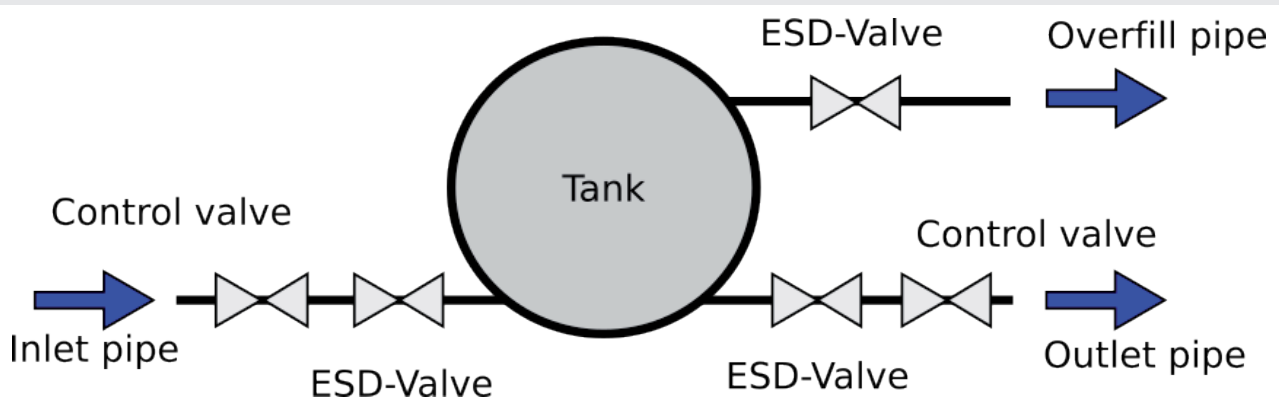


Figure 1: Tank with piping system and tanks safe valves



Figure 3: Tankstorage pipeline system with TRI-CON butterfly valves

The second imported property is the absolute tightness. In case of emergency even smallest leakages can cause big risks.

The second important safety system is the overfill prevention system (Figure 1).

Every tank has a third output pipeline at the tank. This pipeline is closed by ESD-Valve directly mounted at the tank. In case of emergency this valve will open and the overfill volume is exhausted through the overfill line.

TRI-CON series: Highest reliability and absolutely tightness

Due to its properties, the triple eccentric butterfly valve TRI-CON by ZWICK ARMATUREN is the best solution for these kind of applications.

In comparison to existing technologies (like ball valves), the TRI-CON butterfly valve has a significant reduction in weight, based on its smaller dimensions.

Additionally, the triple offset design of the disk and seat create a complete gas tightness (Leckrate A based on DIN EN 12266-1). This is very important, because also smallest leakages can cause significant risks.

In addition to the absolute tightness, the triple eccentric design creates minimum friction and

therefore less opening and closing torques. Hence, required stroking times can be realised by a simple actuator automation.

The TRI-CON butterfly valve with a proper actuator can be certified in redundancy for SIL 3 services.

TRI-CON butterfly valve design is "firesafe" certified, by ISO 10497 and API 607 6th ed., standard. Therefore, it is guaranteed, that the valve will fulfill its safety function (open or close) in case of fire.

To prevent hazards by external packing leakage, the TRI-CON Series uses "zero leakage" packing, certified by TA-Luft II.

As an option the TRI-CON butterfly valve can be mounted with dead space free bearings, by using these bearings medium as well as contaminations cannot be collected in the bearing.

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