

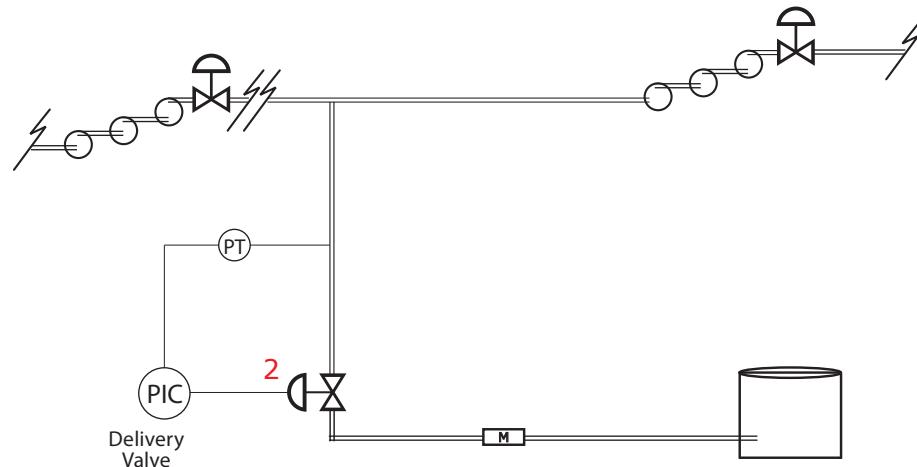


TERMINAL INLET PRESSURE CONTROL



BACKGROUND: When transferring crude oil and petroleum products from the main line to the terminal, pressure control is critical. Therefore, reducing the variation in delivery pressure will result in uniform flow rates that will provide protection from over-pressure conditions in terminal systems.

Reductions in pressure variation is best accomplished with a terminal inlet pressure control valve installed in the delivery line. The inlet pressure control valve is also known as "holding pressure" or "delivery pressure" control valve.



KEY TO SUCCESS: Of this application are engineering a valve and actuator assembly that is capable of modulating with precise control, while also providing a fast response to the abnormal pressure disturbances

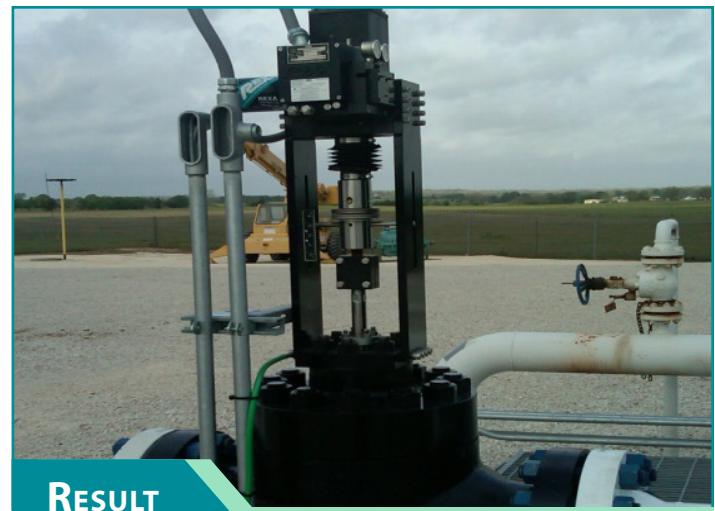
ELECTRAULIC™ ACTUATION

that occur in the main line. Normal operating pressure differentials across the valve range between 50 psid up to 250 psid. Poor valve performance could potentially cause unwanted pressure excursions leading to unscheduled pipeline shutdowns and unit downtime.

PROBLEM: High pressure differentials are concerning due to the potential for cavitation in the flow through the terminal inlet pressure control valve. Cavitation occurs when the flow stream pressure falls below the fluid's vapor pressure. This forms bubbles that will implode once the fluid pressure recovers. These bubble implosions cause severe damage to the valve and in some cases to the downstream pipeline. Pipeline companies seeking a solution to their pressure variation problems have found that REXA Actuators provide stable control, fast and precise modulating control, and high reliability.

SOLUTION: Fast response to signal command and precise modulation of the terminal inlet pressure control valve are essential to flow control and stable pressure for safe operation. To meet these requirements, REXA Electraulic™ Actuators are the solution. The self-contained Electraulic™ Actuators combine the simplicity of electric operation, the power of hydraulics, the reliability of solid state electronics, and the flexibility of user configured control.

REXA Actuators are comprised of two primary subassemblies: a mechanical subassembly and an electrical subassembly. The principle behind this technology is a unique hydraulic circuitry called the flow match valve system. The actuator incorporates a bi-directional gear pump coupled to either a stepper or a servo motor that provides a highly efficient method of pumping hydraulic fluid from one side of the double acting cylinder to the other. The discrete operation of the motor and pump creates action only when a position change is required. Once the required position is reached, the motor shuts off and the flow match valve system hydraulically locks the actuator in place. Minimal power is required to maintain actuator position. The motor and pump sit idle until a new command signal is received.



RESULT

REXA Actuators have provided the quick response and precise level control required to achieve stable pressure and ensure uniform delivery rates for transferring crude oil and petroleum products from main lines to terminals. Closure rates for 100% travel are usually between 10-15 seconds and are fully customizable to be faster or slower depending on end user requirements.

Commonly used valve types are ball, butterfly and globe valves. However, the higher cavitation coefficient provided by a globe valve makes it the most common. Combining globe valves with the precision and quick response of REXA Electraulic™ Actuators has proven to negate cavitation problems and increase valve uptime and unit reliability.

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