

Air valves

By Richard Schneider, contributing editor

ensure safe fuel transfers

We've all seen the unfortunate results on the evening news when fire engulfs a tanker truck or refueling station. While there are safety regulations in place, anything that can be done to make fuel transfer more hazard-free is always a welcome addition.

Youngs Tank Inc. Boyd, Tex., builds multi-compartment tanks — with a typical total volume of 4500 gal — that are mounted on truck chassis to deliver various grades of gasoline and diesel fuel. A dual manifold below the tanks carries the product from its compartment to the discharge system. Individual air-operated fuel valves connect and disconnect the compartments and the manifold. (The truck's compressor is the source of air for this operation.) Once a connection is made, a pump is started to move the fuel out of the compartment and into the delivery system.

A potential problem with this type of system is accidental mixing of fuels during the changeover from one compartment to the next during the delivery procedure. If the operator had to select and actuate individual valves and pumps, the selection process and its timing could result in errors and delays that would provide opportunities for cross-contamina-

tion. Youngs Tank eliminates the possibility of cross-contamination by using a sequence programmer from Clippard Instrument Laboratory, Cincinnati, to control the final delivery.

The DSP Sequence Programmer is a mechanical device consisting of a structural frame, a central rotary shaft with provision for as many as 13 cams, and a steel mounting bracket for the same number of camfollower pneumatic valves. (Youngs Tank uses Clippard's MIV-3 valves — one for each compartment.)

A manual control knob is mounted on the end of the shaft that extends through one end block, and a plate underneath the knob identifies which valve is cam-actuated at each knob position. The shaft is fitted with a spring-plunger detent mechanism. The pneumatic system also includes a master shut-off valve that is air-piloted to close and open mechanically with a large red button operator.

The sequencer is mounted near the truck's delivery system, to make it convenient for the operator when making the connection to the customer's tank. Whenever the operator rotates the sequencer's control knob to select a compartment, one



Typical 4500-gal fuel-delivery tank (top) built by Youngs Tank. Delivery control station at rear of tank (bottom). Red button at lower right of photo actuates main shut-off valve; adjacent dial operates mechanical sequencer.

MIV-3 valve pilot-shifts the master shut-off valve to close it. After the appropriate tank is dialed in, nothing can happen until the operator depresses the red button. Two compartments cannot be connected to the fuel manifold at the same time. In essence, the sequence programmer selects the tank, but the master shut off valve determines when it will empty.



DSP can hold as many as 13 cams, with the same number of pneumatic valves. These normally closed, 3-way MIV-3 cam-actuated pneumatic valves have 1/8-in. ports, are rated to flow 25 scfm at 100 psig, and require a force of 38 oz. to shift.

Bo Fox and Russ Hamilton of Youngs Tank provided descriptions of this application. For more information, call Youngs Tank at 800-345-7952, or visit Clippard's website, www.clippard.com