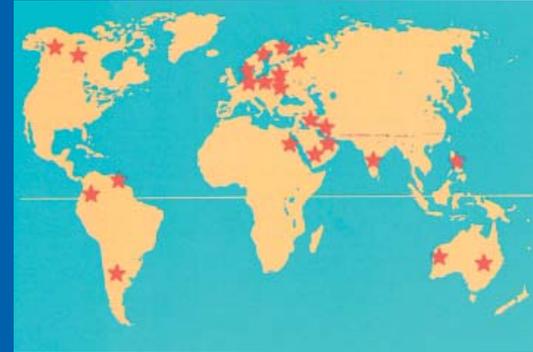


M&J VALVE
An SPX Process Equipment Operation

SPX Process Equipment

Surge Relief in Liquid Pipelines



Installations Worldwide

Surge-Relief Systems ranging from single-valve to integrated, complex, turnkey installations beginning with hydraulic transient analysis.

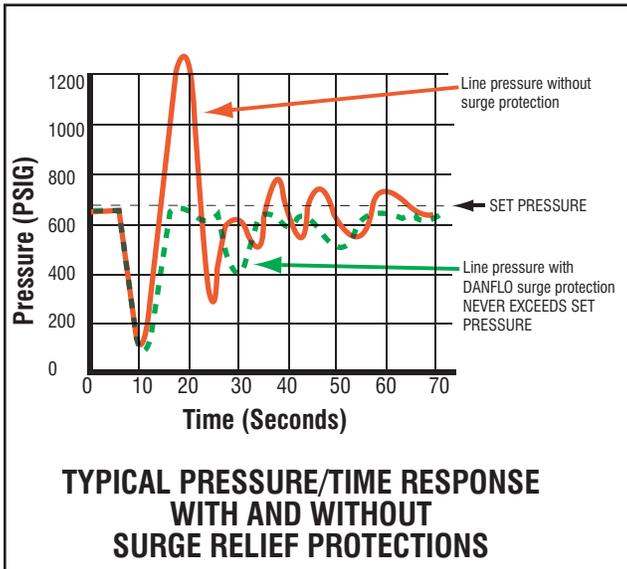


Surge Relief in Liquid Pipelines

In many applications-pipelines, loading and storage terminals, and similar situations-equipment and personnel need to be protected from the potential damage that can be caused by pressure surges. These pressure surges can be generated by anything that causes the liquid velocity in a line to change quickly.

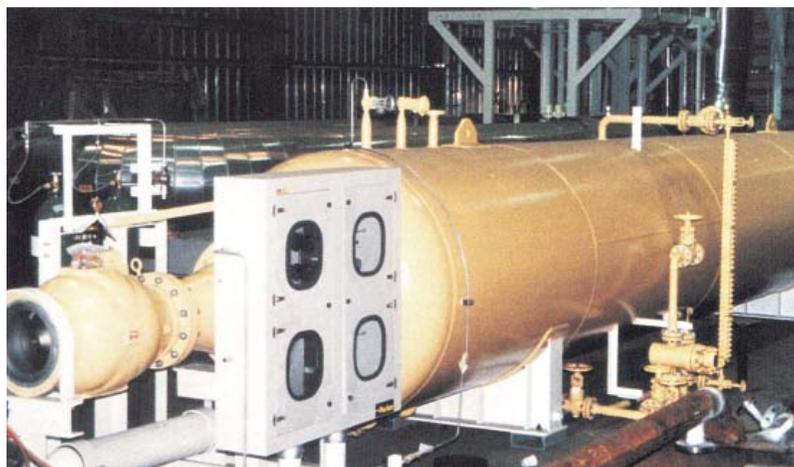
To protect from flange separation, leaks or major piping damage, the surge must be eliminated. The DANFLO® surge-control valve, with its very quick response time and high flow capacity, is ideally suited to surge-control applications. In such systems, nitrogen pressure is used to hold the valve's internal plug (piston) tight against its seat.

When a surge interrupts normal steady-state flow, the system quickly and automatically opens the valve thus relieving sufficient liquid volume to eliminate the surge. As the surge is dissipated, the valve closes without slamming shut. It is then ready to act again upon any subsequent surge. The line is constantly protected from build-up of pressure surges.



Sophisticated State-of-the-Art Pipeline Surge Relief

To protect an entire large Middle East pipeline, fourteen unmanned systems were equipped with multiple valves to provide sufficient surge-relief flow volume. A nitrogen control system includes automatic backup/changeover/alarm when nitrogen volume falls below a specified limit. This large project, which represents a unique concept in design of surge-relief systems, involved contributions from and close cooperation by various specialists in several M&J Valve companies.



Unique Surge System Preserve Metered Flow

Using a 12" 150# DANFLO valve, this system provides the reliable surge protection which has established M&J Valve's reputation worldwide-but it also conserves the valuable, metered crude oil. Conventionally, the oil discharged from a surge relief system is piped to a "slop tank"; in this system, a nitrogen blanket in the large cylinder is used to inject oil back into the pipeline.

Unique “Floating-Set-Point” Protection with Fixed-Set-Point Backup*

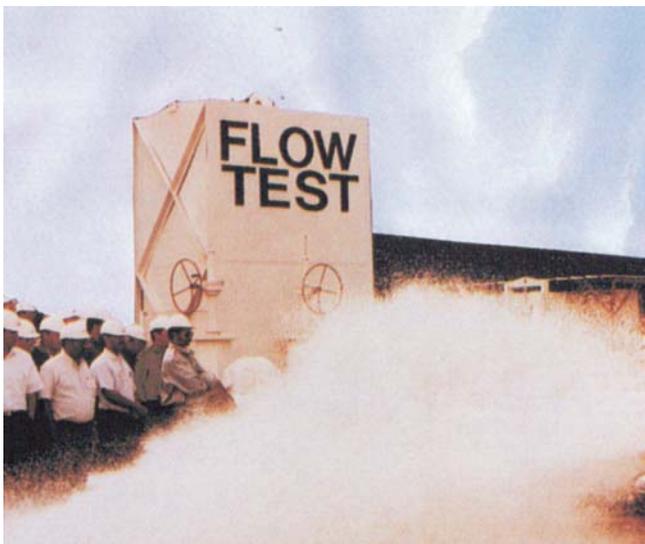
This stainless steel surge-relief system protects a 60-inch salt water line used in waterflood to secondary recovery by a major Middle East producer. Utilizing four 12” DANFLO surge-relief valves in parallel—three operational and one standby—the unit includes a control system for each valve which monitors rate-of-change of upstream pressure and initiates opening of the DANFLO valve whenever the rate of pressure increase exceeds a specified limit. Floating set-point protection is thereby provided.

In addition, the upstream pressure is monitored for increases above a fixed pressure set point, as in a conventional surge-relief system.

The system therefore accommodates a varying pipeline pressure (at a rate below the transient valve selected) while still protecting the pipeline if a surge occurs or if the maximum allowable pressure is exceeded. Pipeline pressure exceeding either causes the surge-relief valve to open. No external power source is required.

A test system is included with the unit to provide a means for checking the DANFLO valves and their control systems for proper operation in the field.

* Patent Pending



DANFLO valves are checked for rapid, smooth, reliable operation at the M&J Valve Flow Loop testing facilities.



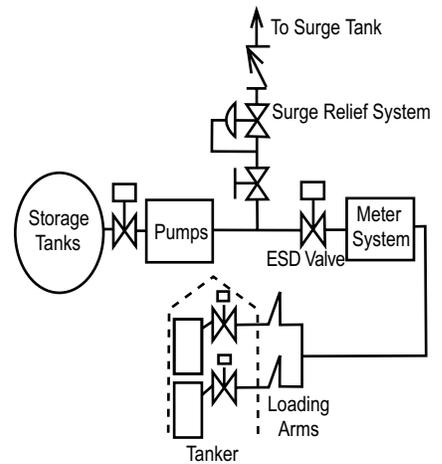
Surge Relief Protection for Marine Facilities

This 30-inch crude oil surge-relief skid protects marine facilities against hydraulic transient pressure surges that can occur during loading and unloading of crude oil to and from oceangoing vessels.

The M&J Valve Team

Because of the diverse technologies and unique products involved in the worldwide application for M&J Valve surge-relief systems, several M&J Valve companies may participate in designing, engineering, fabricating, testing, operator training, and installing a system to meet specific customer needs.

Each surge-relief system is designed to specific requirements. To insure the maximum return on buyer's investment, the best design for the specific application is determined from a complete and qualified hydraulic transient analysis.



Typical Tanker Loading Facility

Major Benefits of Using M&J DANFLO® Control Valves

- High Flow Capacities (Cv) means smaller and/or fewer valves to save installation costs and weight.
- Fast response-rapid opening, controlled closing without slamming
- Additional reserve flow capacity for unexpectedly large surge transients.
- In-line testing easily performed via set-pressure test port.
- Line-pressure operated-no separate power source required.

For more information about our worldwide locations, approvals, certifications, and local representatives, please visit our web site.

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SPX Process Equipment

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SPX Process Equipment reserves the right to incorporate our latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing. Certified drawings are available upon request.

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