

## **Hydraulics Based Pump Station Valve Solutions**

**Challenge:** Pump station valve selection can present a challenge to the Engineer and Owner. Common considerations include preventing the damaging consequences of surge pressure transients (water hammer) related safety issues, pipeline breaks, fitting failures, cross connection, flooding and water loss. Additional concerns may include minimizing check valve slam, elimination of air pockets and vacuum conditions, surge relief valve necessity and size, pump control valve considerations and options, valve operating speeds, reducing pumping energy costs and dependable isolation valve service.

**Solution Assistance:** DeZURIK offers applications assistance and valve solutions specifically for pump stations-design challenges. DeZURIK's broad range of valves under the DeZURIK/APCO/Hilton and Willamette brands combined with in-depth expertise of our technical staff uniquely positions DeZURIK to analyze pumping systems and to provide options for practical, cost effective check valves, pump control valves, surge relief valves, air valves-and isolation valve solutions.

**Pump Station Application Data:** Early in the pump station design process, DeZURIK collects information from the Engineer in order to determine the technical parameters of the particular pumping application and to develop an understanding of the customer requirements. DeZURIK's Basic Surge Investigation Input Data Form can be used to efficiently provide the pertinent information.

Surge Analysis, Valve Suggestions, Report: The potential for surge pressure transients (water hammer) is examined utilizing governing fluid mechanics equations. A report will be provided that includes: the maximum surge pressure potential, the surge period, line velocity, surge wave speed, pipeline constant, and total system head potential during a surge event. Analysis of these results and the information provided enables DeZURIK to include in the report suggestions for applying check valves, pump control valves, surge relief valves, and air valves to minimize surge pressure. In addition the check valve or pump control valve suggestion can be discussed. The potential for check valve slam can be addressed and valve solution options provided. Pump Control Valve Actuation options can also be evaluated. The need for surge relief valves can be investigated and surge relief valve sizing suggestions will be provided if applicable. An analysis can also be provided that takes into account pumping costs (head loss), valve budgetary pricing and relative maintenance costs of different valve types to arrive at valves that provide the lowest cost of ownership of the project life. Alternatively, if there is a preferred valve design, DeZURIK is available to confirm it's suitability for a particular project. Suggested specifications for the valves selected for use on the project by the Engineer and tailored to the particular application will then be provided.

To get started, simply complete the **<u>Basic Surge Investigation Input Data</u>**. Form on the reverse side of this page (or complete the electronic version) and return to your local DeZURIK/APCO/Hilton Representative for review.



## **Basic Surge Investigation Input Data**

Location:			
Contact Name:			
Phone:			
of Pipeline:			
<u>)</u>			
Static Head at Check Valve:			
Maximum			
Number of Pumps: Pump Discharge Diameter: Pump Type:			
Rated Flow:			
art/Stop):			

## **Additional Information**

- Provide a description of the pump duty cycle (ie. 24/7, 365 days per year; infrequent use during storm; 1 pump will run continuously, 1 will run 30% of the time, 1 is a standby, etc.)
- Provide pipeline profile drawing if available.
- If pipeline consists of different sections of different diameter or material, provide data for all sections.
- If different pump sizes are used, provide above data for all sizes.
- Provide drawings of pump station if available.
- Provide pump curves if available

Form #1741-0715