Cla-Val "SurgeView" Transient Analysis Guidelines

Cla-Val has a new pipeline transient analysis service called "SurgeView". It is available as a service to specifying engineers as an aid to selecting the right Cla-Val products to prevent and relieve surges. The following guidelines detail the inputs required to do the analysis.

The software plots the results of the transient in real time and "animates" the transient waves over the period of the transient event. The final results can be viewed in PDF format or animation format with Microsoft PowerPoint or Windows Media.

Cla-Val will normally charge a fee for this service, which will be determined by the amount of estimated time to run the analysis. Furthermore, Cla-Val will not assume total responsibility for or guarantee the analysis. A qualified consulting firm is recommended for these cases and for complex pipelines.

The following guidelines apply:

1. **Only simpler pipelines will be considered, preferably single or branching pipelines. If it is a looped pipeline, only a limited number of loops (3 to 5) will be allowed.**

2. The system must include Cla-Val equipment.

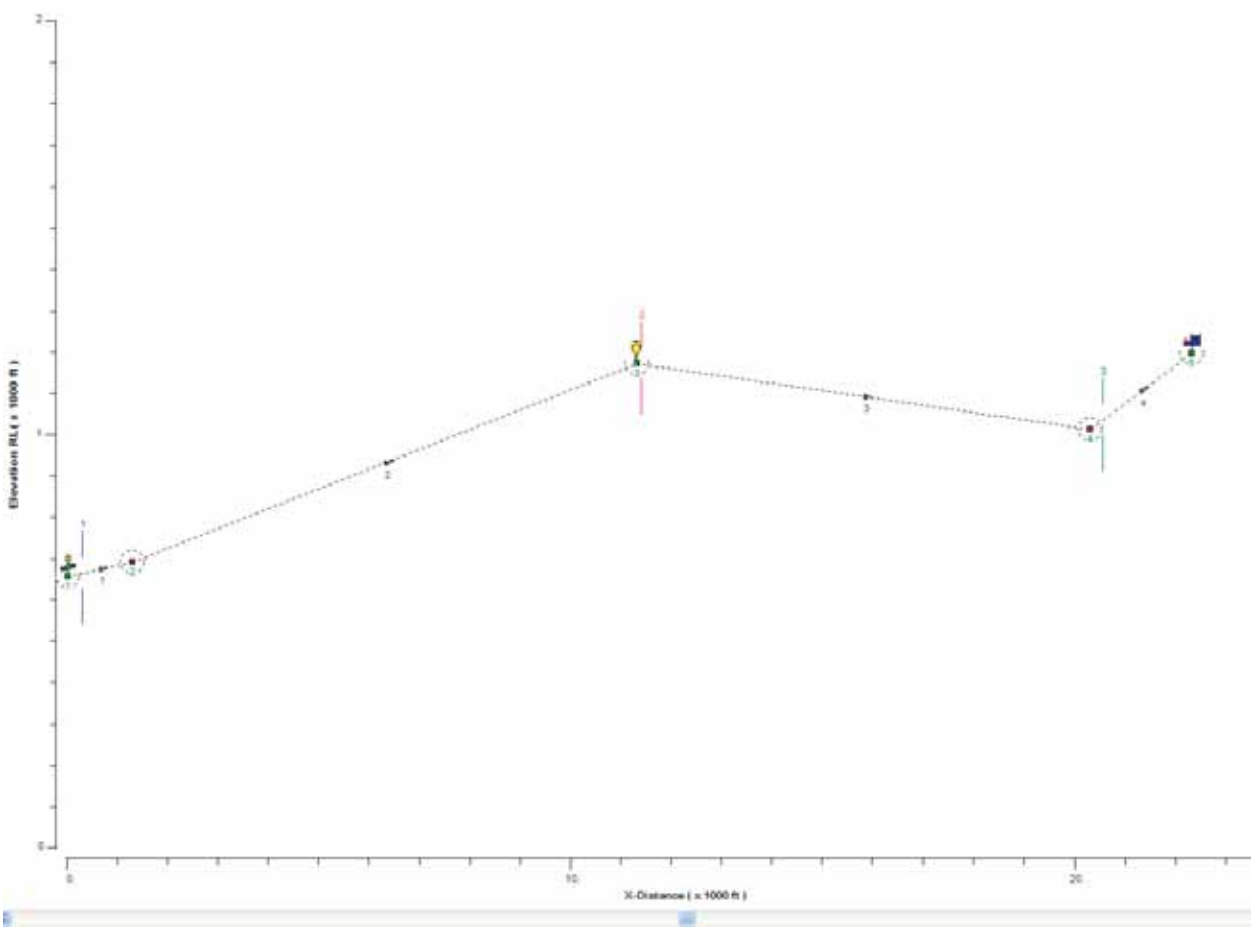
3. All necessary information will be made available on a timely basis. Typical inputs required are:
    a. Pipes (each segment)
        i. Inside diameter
        ii. Wall thickness
        iii. Material
        iv. Length
        v. Profile data (including suction and discharge levels)
        vi. Include any dead end pipes (important!)

    b. Boundary conditions
        i. Reservoirs or tanks
            1. Water surface elevation
            2. Exit and entrance resistance coefficients (K factors)
        ii. Air valves
            1. Location (assuming these are already designed)
            2. Orifice size (inlet and outlet)
        iii. Check valves
            1. location
            2. resistance coefficient (K factor)
            3. reverse velocity closure (or type and model)

iv. Control valves (to be used for surge prevention)
    1. Model (pump control, relief, surge anticipator, etc)
    2. Diameter
    3. Setpoint on pilot controls
v. Pumps
    1. rated flow
    2. rated head
    3. rated rpm
    4. pump-motor moment of inertia WR2 (if known)
vi. Other (Air chambers, turbines, surge tanks, standpipes, etc)

Example: Pump failure inputs

- Pipe – 36”, Ductile Iron (new), .38in wall thickness, profile shown
- Pumps – 3 @ 6.2 cfs each, 550 ft rated head, 1800 rpm, 80% efficiency, 156 lbm-ft2 pump-motor moment of inertia
- Check valve at pump station and 6in air valve located as shown
- Discharge to reservoir, discharge level provided
- Maximum desired surge pressure



Results provided – Cla-Val Surge Anticipator Valve size and model, recommended Cla-Val air valve type, location and model (if air valve slam is predicted). A transient pressure plot in PDF and animation in PowerPoint or Windows Media is provided.