

## Societe du Canal de Provence

### Background

The Société du Canal de Provence (SCP) was created in 1957 by three territorial authorities, Bouches du Rhône and Var County Councils and Marseilles City Council, to help bring and distribute water throughout the Provence and Côte d'Azur Region, a major barrier in their development. The three councils, joined later by the Provence-Alpes-Côte d'Azur Region Council, pooled their water rights and appointed SCP to develop water engineering in the Provence Region. The main feature of this development involves the construction and operation of the Canal de Provence.

The Canal de Provence and the other schemes implemented by SCP, irrigate a total of 74,000 hectares, over one third of the area farmed. They also supply drinking water or untreated water requiring only elementary treatment to 800 industrial and craft plants and about a hundred towns and villages.

The shortage of water in the Provence region means that SCP has to share the available resource fairly between its customers, at all times and without wastage. Today it is recognised as one of the world leaders in the automated operation of major hydraulic schemes.

Apart from its main role as conveyor and supplier of water, the engineering expertise developed by SCPid INGENIERE DEVELOPEMENT, in such fields

*Société du Canal de Provence avoid large investments in structural renovation by using Flowmaster.*



as studies for the development and application of O&M, constitute essential components of its overseas interventions as engineering consultants providing technical assistance and project development.

SCP have used Flowmaster since 1995.



## Objective

During the renovation process of the networks at Rove and Rebuty on the Berre Sud water supply, SCP needed to know if it was appropriate to rebuild the structural casing around the water hammer safety valves installed on a DN 1300 pipe, which had been unsettled by a foundations problem. The aim of the study was to define the use of the safety valve to decide how to renovate the damaged works.

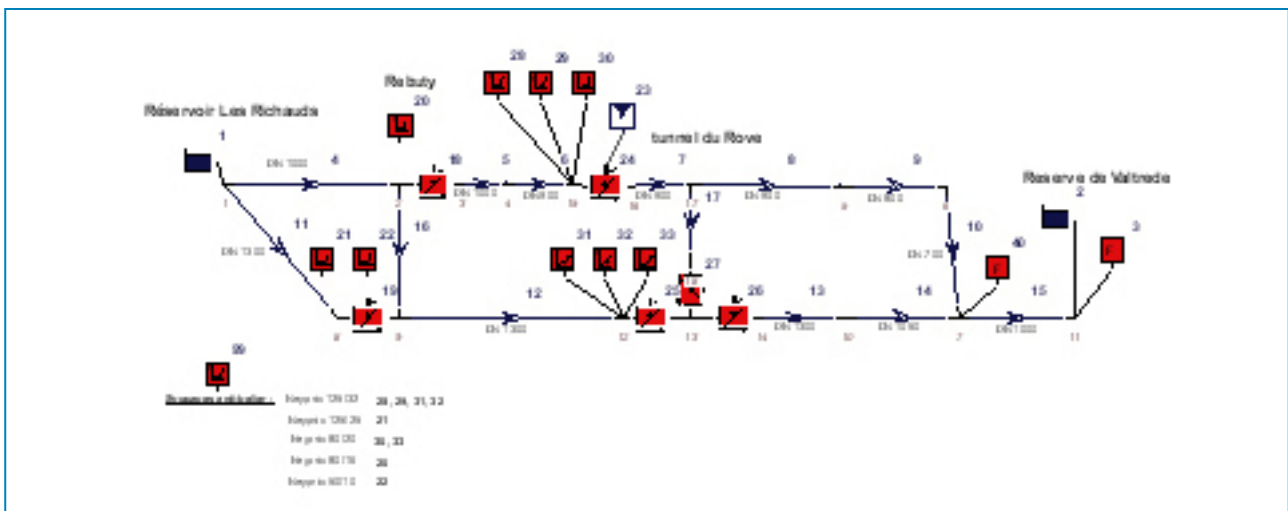


Figure 1: One of the networks used for the study

## Simulations

The flow rate taken into account for all of the DN 1000 and DN1300 pipes between Les Richauds and Rebuty, was set to 2.5 m<sup>3</sup>/s for an initial steady state. This was obtained by adjusting the extracted flow rate upstream of the Valtrède pipe and downstream of the Valtrède reservoir. This could be considered as the maximum flow

rate that could be derived from Giraudets, considering the characteristics of the DN 2000 pipe Giraudets – Les Richauds, with a roughness hypothesis of  $k = 5$  mm. This characteristic is probably lower than reality, but reasonable if we consider that the pipe could be scraped to maintain this flow rate aim. This flow rate is largely above the maximum one observed till now, namely 1.8 m<sup>3</sup>/s measured last summer.

Each simulation corresponds to the closing of the different valves located on the Rebuty and Rove network. The closing time of the valve is set to 10 minutes which is the actual case with the installed closing system, indicated by users. Examples of the obtained results, with and without safety valves, are shown in Figures 2 and 3.

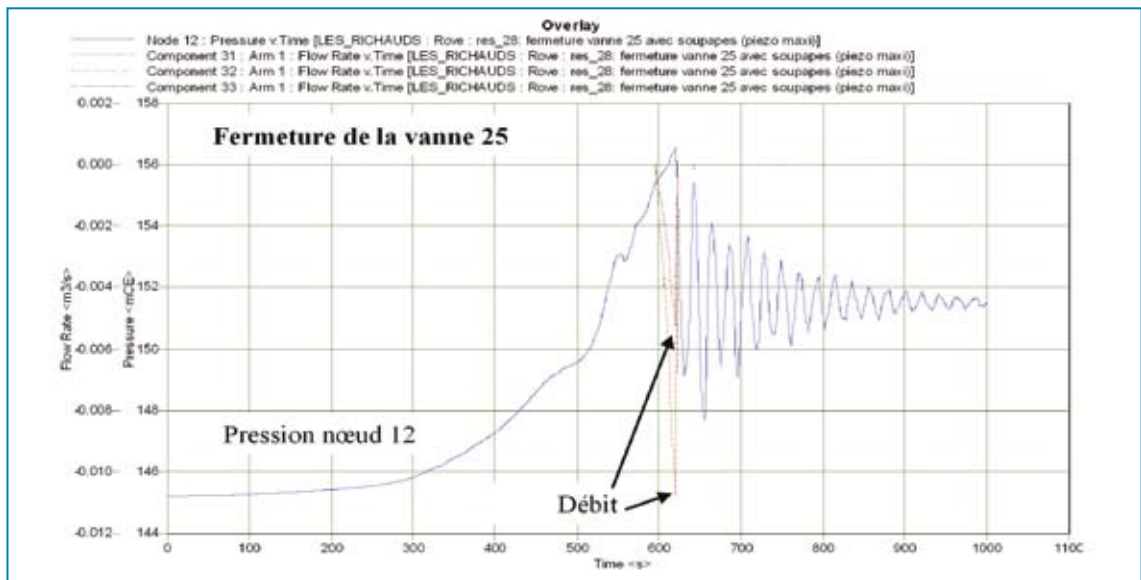


Figure 2: Pressure variation at closure of the valve, with safety valves

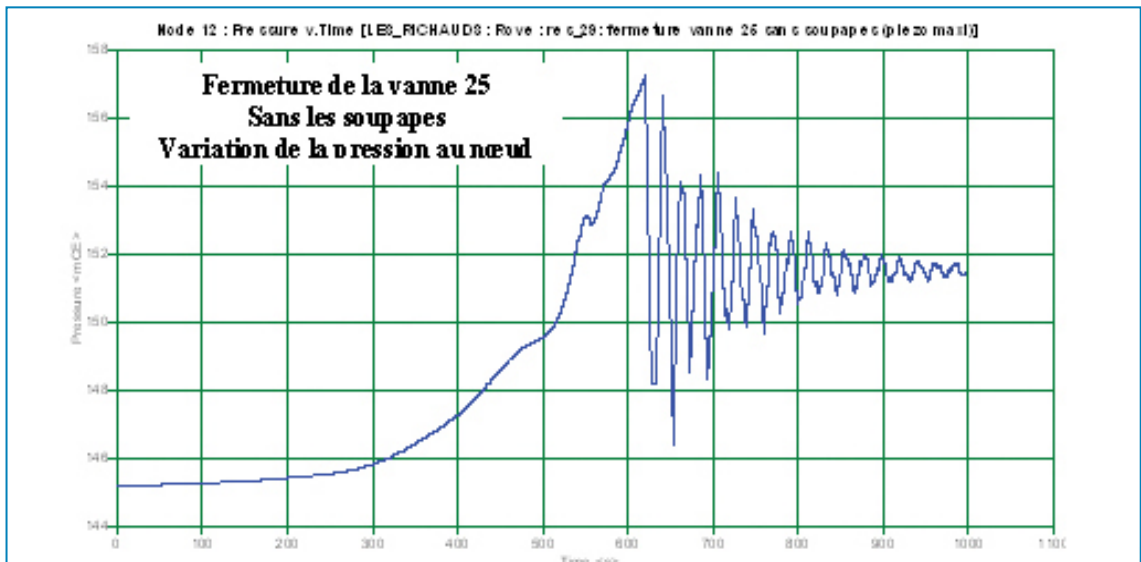


Figure 3: Pressure variation at closure of the valve, without safety valves

## Conclusions

A simulation of the transient behaviour in the main Berre Sud pipe, which carries water between the Richauds and Valtrède reservoirs, resulting from the non simultaneous closing of two valves on the Rove and Rebuty network, were carried out using a maximum possible flow rate of 2.5 m<sup>3</sup>/s.

In the Rove case, it appeared that the water hammer safety valves located on the DN 1300 pipe upstream of the considered valves, only have a marginal effect and to suppress them will have only a few incidences on the maximum working pressure. As far as safety valves on the DN 900 pipe are concerned, the simulation of the closing of the corresponding valve showed that the safety valves did not open.

In the case of Rebuty, it appeared that the 3 water hammer safety valves installed were useless. This conclusion backs up the user's indication that they had not opened in the past.

Therefore, it is not justifiable to proceed with the renovation of the structural casing surrounding the safety valves on the DN 1300 pipe.

It has been suggested to purely and simply suppress the safety valves and the associated structural work, resulting in a saving for SCP of several tens of thousands of euros.



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