

Polysius SAS

Predicting and avoiding Water hammers

Polysius had a simulation of transient behaviour carried out in order to ensure that there were no water hammers in the fire systems of two new cement works that it is installing in Morocco. The study carried out using modelling software (Applied Flow Technology) confirmed the quality of the facility.



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OUR CUSTOMER

Corporate name
Polysius SAS

Sales turnover
Between EUR 150 and 250 million depending on the years (mainly export)

Workforce
170 people

Activity
French subsidiary of the German company Polysius (Thyssenkrupp group), Polysius SAS designs and builds complete or partial cement production facilities and modernises and improves the capacity of existing units. It is also involved in mineral pulverising units (phosphate, iron, copper, etc.).

The French subsidiary of the German company Polysius specialises in construction of cement works and constructed two production units in Morocco with a unit capacity of 1.6 million tonnes per annum. The first cement works started operation late 2010 after 30 months of works. The second unit should be commissioned in 2012.

"We design all the installations of the cement works, fire systems included, stated Christian Sivry, technical manager at Polysius. Construction of the two fire systems, for these installations was subcontracted to Protec Feu, a specialist company."

25 fire hydrants

Each of the systems is composed of a reservoir of 6,000m³ of water which supplies three pumps operating in parallel. Two of them are driven by an electric motor, the third by a diesel motor. The pumps discharge water into a network of buried high density polyethylene pipelines which supply 24 or 25 fire hydrants depending on the sites. Each hydrant is beside a cabinet enclosing the hoses which are unwound if required. A 300-litre tank pressurised by a Jockey pump keeps the system at a pressure of 11 bars.

Simulating the transient state

"Even though we control operation of fire systems, our customer asked us to check that there were no risks of water hammers that could occur upon simultaneous interruption of one or several pumps", related Christian Sivry.

The analysis was carried out by Cetim's specialists from installation drawings. To this end, the Centre's experts used the AFT/Impulse module of the pipeline network calculation and modelling software Applied Flow Technology (AFT). The AFT/Impulse module makes it possible to simulate behaviour of systems in transient state.

In Christian Sivry's opinion: *"the calculation does not reveal high overpressures-vacuum pressures characteristic of water hammers. Moreover, it so happens that polyethylene pipelines are able to absorb transient overpressures".*

Cetim's asset

Cetim provides industrial partners with its



knowledge of hydraulic systems and control of the Applied Flow Technology

(AFT) software which enables analysis of water hammer risks in hydraulic plants.