



CASE STUDY

INDUSTRY: REFINERIES



CUSTOMER: Total



LOCATION: Oudalle, France

BACKGROUND: Total, the world's tenth-largest refiner and petrochemical maker manufactures high-value hydrocarbon products used in various industrial applications: paint and varnish, glues and adhesives, sealants, printing ink, heating, drilling fluids, lubricants, and more. The Oudalle refinery experienced significant damage in their condensate pipes and ancillaries due to water hammer and had to replace many of them several times per year.

SCOPE OF WORK: Armstrong International conducted an assessment to find and analyze the causes for water hammer in the condensate system. The condensate temperatures out of the reboilers varied depending on the load of the distillation columns, some were at 320°F (160°C) and others less than 176°F (80°C). The pressure of the condensate return network is low and results in condensate flashing partially between the column and the heat exchanger. In other parts of the network, some check valves were also missing.

Armstrong's solution was to decrease the temperature of the high temperature condensate with condensate at low temperature in a MTS (Mixing Thermo-Siphon) and avoid risk of return flows by installing check valves.

Armstrong's specialized engineer conducted a detailed audit to design a solution to avoid water hammer. Armstrong delivered a complete turnkey installation including a MTS, one back pressure control valve and three check valves.

Benefits: An internal coil slowly raises the temperature of the hot condensate until it reaches the mixing temperature with cold condensate, preventing water hammer to occur. By preventing potential water hammer, the refinery's condensate system efficiency improved as well as its safety standards.

