



## Water Hammer

**Customer:** CPCU

**Location:** Paris, France

**Scope of Work:** The 480km of steam/condensate piping in the Paris district heating loop was experiencing accelerated piping wear and severe water hammer. The water hammer was a critical safety concern as well as a source of continual annoyance to over 5000 CPCU commercial/residential customers because of the loud banging.

Armstrong International was asked to design a solution to the water hammer problems without causing any service inconvenience for CPCU's customers.



**Upgrade Projects:** Armstrong conducted an extensive audit of the system to include:

- Data logging of pressure and temperature at different areas of the steam and condensate network to isolate water hammer problem areas
- Assessment of different working conditions depending on period of the day and period of the year

Following the audit, Armstrong put in place concrete solutions:

- Design of a custom made steam trap to handle their CPCU's unique application
- Design of a tailor-made thermo-siphon mixing device using cooler condensate from return lines to cool hot condensate coming out from drip legs to mitigate the water hammer
- Armstrong provided Best Practice engineering drawings for CPCU's main line condensate stations

**Investment:** The total value of the agreement was over \$250,000 Eur.

**Terms:** Project scope began in 2001.

- Benefits:**
- Armstrong received an award from CPCU for their product innovation
  - Elimination of water hammer provided CPCU with happier customers and a safer work environment for CPCU maintenance personnel
  - Reduction of costly unscheduled maintenance
  - Substantial condensate saving
  - Improvement of steam quality and reduction of wear in pipes

