

Med *Clean* *Propre* *Limpio*iterranean



Regional Activity Centre
for Cleaner Production



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Department of the Environment
and Housing

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Pollution prevention case studies

Optimisation of refrigeration procedures for dairy products

| | |
|-------------------------------------|--|
| Company | Eurial Poitouaine. |
| Industrial sector | Manufacturing of dairy products. |
| Environmental considerations | Refrigeration is a key element in the dairy products production process, and is especially important for the pasteurisation and conservation of products as they leave the factory production sequence. |
| Background | <p>The Eurial Poitouaine refrigeration plant comprises three units operating at different regimes according to the position they occupy in the chilled water circuit.</p> <p>Previously, the absence of coordination and inter-regulation across the different units resulted in poor overall performance, as two of the three units were operating well under capacity. For the same reason, this situation caused product quality, conservation and bacteria problems, as the temperature of products leaving the factory was sometimes as high as 5°C instead of the required 0 or 1°C.</p> |
| Summary of actions | <p>Faced with these problems, Eurial Poitouaine conducted a re-assessment of its refrigeration system.</p> <p>In the light of the results of this re-assessment, the company decided to intervene to improve the operation of its existing refrigeration installation.</p> <p>This involved two actions:</p> <ul style="list-style-type: none"> - Installation of a PLC equipped with a differential pressure sensor which coordinates the operations of the different refrigeration units and guarantees stability of return chain temperatures. - Installation of an electronic speed controller in the first pump (in a cascade configuration) to optimise its operation. |

Photo

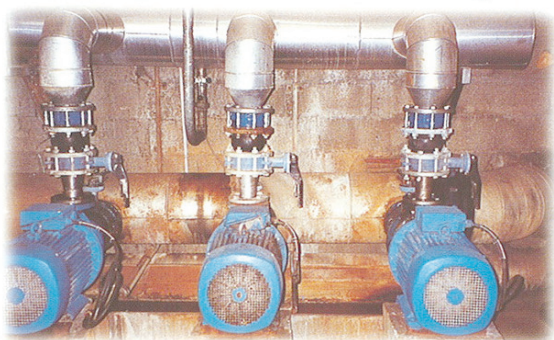


PHOTO : EURIAL POITOURAINE

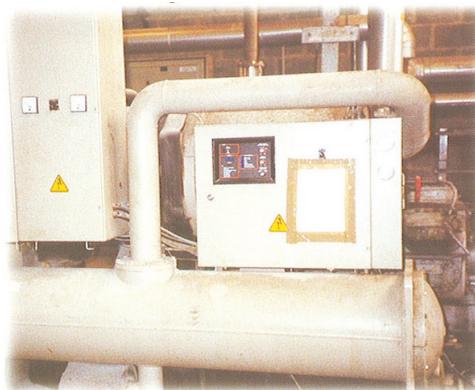


PHOTO : EURIAL POITOURAINE

Balances

| | New process |
|-----------------------|--|
| Annual energy balance | Electricity consumed in producing chilled water: Before: 1,270 MWh/year (282 toe) After: 913 MWh/year (203 toe) |
| | Energy savings: 357 MWh/year (79 toe) (a 28% reduction in energy costs incurred in chilling water relative to pre-installation costs) |
| Economic balance | Direct financial gain from energy savings: €12,196 Indirect financial gain: €30,490 (deriving from reduced peak refrigerator energy demand and reduced callout penalties) Total savings: 42,686 €/year |
| Total investment | €87,353 |
| Payback period | 2 years |

Conclusions

The optimisation of its refrigeration system has allowed Eurial Poitouaine to reduce its defective products rate, improve refrigeration storage capacity and extend equipment service life via better use.

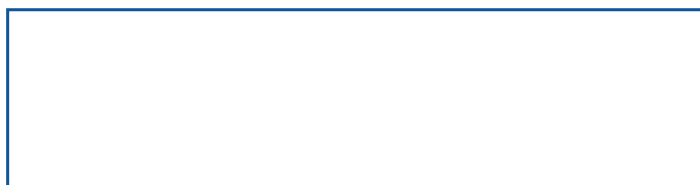
A system like this meets the needs of the company and has allowed it to fully optimise its production processes and thereby reduce its energy consumption.

Eurial Poitouaine has now decided to adopt the same process for several products.

NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.

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