

Energy Efficiency Division

Water Pumping Station

Save energy,
get profit





MEASUREMENT

Flow – Pressure – Electrical power

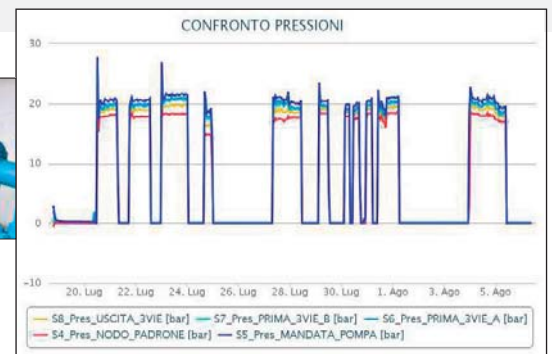
4 months of continuous collection of data (1 minute sample) in order to define the baseline of consumption, peaks and temporary change of load. Thanks to these information together with localized and distributed pressure loss in the pipe plant it was possible to determinate the correct working point.



DATA ANALYSIS

- 4 mono-stadium centrifugal pumps 75 kW
- Consumption: 877.820 kWh
- Non optimized efficiency 45-52%

One of the main problem has been identified as to a manual valve “half-closed” to reach the flow rate desired.



ACTION

- Fully open the out valve
- Installation of a pressure sensor to drive 2 inverters (not 4) and reduce the output pressure
- Electrical motors have been changed to IE3 and some pipes has been changed too



MONITORING

The system is now supported by a continuous monitoring to prevent problems (specific alarms settled as per customer requirements) and at the same time to verify that the efficiency level reached is maintained.

Data	Rendimento_Pompa_P2	Lavoro_Pompa_P2	Potenza_ele_Pompa_2
20/07/2015 12:00	45,68	21,82	47,76
20/07/2015 13:00	29,63	15,93	53,76
20/07/2015 14:00	32,39	17,13	52,88
20/07/2015 15:00	32,96	17,36	52,68
20/07/2015 16:00	32,36	17,11	52,88
20/07/2015 17:00	32,25	17,1	53
20/07/2015 18:00	32,6	17,2	52,76
20/07/2015 19:00	31,27	17,51	52,64
20/07/2015 20:00	32,54	17,17	52,76
20/07/2015 21:00	32,5	17,12	52,68
20/07/2015 22:00	32,28	17,07	52,88
20/07/2015 23:00	32,49	17,11	52,68
21/07/2015 00:00	32,86	17,31	52,68
21/07/2015 01:00	32,4	17,13	52,88
21/07/2015 02:00	33,43	17,61	52,68
21/07/2015 03:00	31,93	16,95	53,08
21/07/2015 04:00	32,84	17,36	52,84
21/07/2015 05:00	33,02	17,4	52,68
21/07/2015 06:00	32,41	17,07	52,68
21/07/2015 07:00	15,87	8,77	55,24



RESULTS

The single pumps efficiency reached is now 66% in media, and the total electrical consumption has been reduced of almost 15%.

RESULTS

BEFORE: **2.603.473 kWh/year**
 AFTER: **2.217.331,20 kWh/year**
 DIFFERENCE €: **81.089,57 Euro/year**
 ROI: **11 months**

Energy Efficiency Division

Hospital

Save energy,
get profit





MEASUREMENT

Temperature - Refrigeration

What's first necessary in an Hospital Operating Room is to guarantee the aseptic ambient. The control of temperature is fundamental, so it's necessary to provide a refrigeration system. Plus, there are patients rooms. How do these system works in terms of efficiency, especially when these units are very big and their consumption is important?



DATA ANALYSIS

- Output temperature from the 3 refrigeration units: 9 °C.
- Minimum input temperature inside the operation rooms before the exchange point: 14.5 °C
- Difference lost: 5,5°C
- Electrical Efficiency: 48% (low)

Every 1°C of temperature lost for the entire circuit corresponds to 370 kWh/day.
Total losses cost to the Hospital more than 149.000 Euro/year.



ACTION

- Restructure some principal pipes
- Full open the radiator windows
- Change the polarity of radiator fans

Another action will be to change the cold water pumps.
The electrical efficiency will be increased of about 6%.



MONITORING

The system is now supported by a continuous monitoring to prevent problems (specific alarms settled as per customer requirements) and at the same time to verify that the efficiency level reached is maintained.



RESULTS

The electrical consumption of this application has been reduced by about 23%.

RESULTS

BEFORE: 3.244.700 kWh per year
 AFTER: 2.498.400 kWh per year
 DIFFERENCE €: 149.256,20 Euro/year
 ROI: 12 months

Energy Efficiency Division

Process industry

Save energy,
get profit

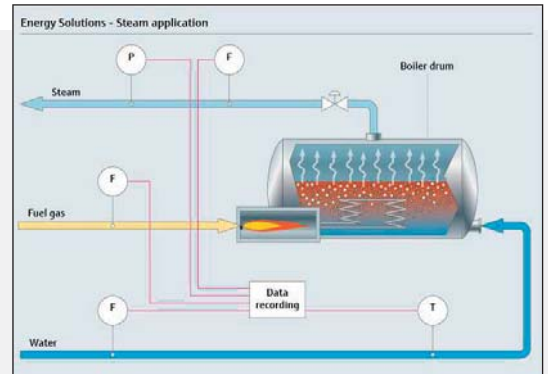




MEASUREMENT

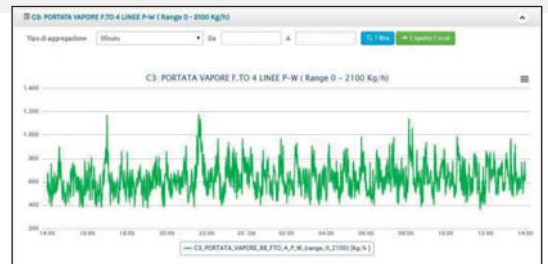
Temperature – Pressure – Heat power

Customer needed to know the specific cost of the lowpressure steam production, and if possible to reduce the total amount of steam request in the factory. That's why was decided a continuous collection of data for 6 months (1 minute sample) in order to define the baseline of consumption, peaks and losses.



DATA ANALYSIS

- Steam production in 6 months: 101.340 kg per day
- Total Consumption: 86.100 kg per day
- Total losses: 15.240 kg per day



ACTION

There are three types of losses:

- Steam production: 12%
- Steam transport: 62%
- Steam utilization: 26%

Even if heaters are from 1976 production, the changing for new types is not profitable (efficiency heaters is in media 88%), what is necessary is to coat the 60% of pipes and reduce the loss steam during the process.



MONITORING

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RESULTS

The low-pressure steam production has been reduced by about 28% without changing the process.

RESULTS

BEFORE: **32.428.800 kg per year**
 AFTER: **23.888.710 kg per year**
 DIFFERENCE €: **130.801,80 Euro/year**
 ROI: **9 months**