

Case Study: **Pumps**

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Background:

While conducting energy audit for a metal industry; the performance of the many of the pumps (cooling water as well as process) was observed to be quite poor.

Operating Scenario:

The performance of individual pump was computed by noting down all the operating parameters including

- Actual flow rate with a help of ultrasonic non-contact type (Transit-time or Doppler-effect as the case may be) flow meter.
- Power drawn by the pump motor with the help of clamp on type power meter (Three phase balanced type or power analyzer as the case may be)
- Suction pressure with the help of digital pressure gauge
- Discharge pressure with the help of digital pressure gauge

The efficiency of motor as well as density of the pumping fluid was also noted down.

It was observed that many of the pumps were operating below the rated efficiency and delivering poor flow rate.

Energy Conservation Measures:

The above concerns and issues were addressed by taking the following measures.

- While inspecting the pump internals, it was observed that many of the impellers were eroded due to suspended particles in the water. The impellers of these pumps were replaced as an immediate measure.
- The strainers of pumps were observed to be damaged; which were replaced. An additional strainer was provided in the main cooling water channel.
- A set of new pumps were procured with higher grade material of construction to counter the erosion issue, as a long term measure.
- The operation of side stream filters of the cooling towers was made more effective.

Outcome:

- The energy consumption of these pumps reduced by around 25%; leading to 2.5% saving in the overall energy costs.

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