

# Predictive Maintenance on pumps

Use Case Proficy CSense

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## PREDICTIVE MAINTENANCE ON PUMPS

### Challenge

In industrial settings, pumps play a crucial role in fluid transfer processes. Ensuring their reliable operation is essential for maintaining process efficiency and preventing costly downtime. The challenging environments in which pumps operate present several scenarios for potential failure and degradation. Key issues include:

#### Corrosion and Wear

These can affect impeller movement and overall pump health.

#### Vibration

Can significantly reduce pump efficiency and increase wear.

#### Cavitation

Causes damage to impellers and reduces the pump's operational lifespan.

These factors can collectively reduce the efficiency and lifecycle of pump assets, making effective monitoring and maintenance strategies essential.

#### Example of pump degradation



### Solution

A continuous monitoring solution based on Proficy CSense can enhance efficiency and deliver predictive maintenance. The solution consists of the following multistep approach:

#### STEP 01

Implement a real time calculation of pump efficiency using power, flow rate, total head, and gauge pressure.

#### STEP 02

Develop and deploy a Principal Component Analysis (PCA) model to identify deviation of pump operation from normal operating conditions.

#### STEP 03

Train a model to classify operating conditions as abnormal/normal

#### STEP 04

Deploy this model online





# Result

The layered approach ensures comprehensive monitoring and predictive maintenance, significantly reducing the risk of unexpected failures and improving overall equipment efficiency.



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