

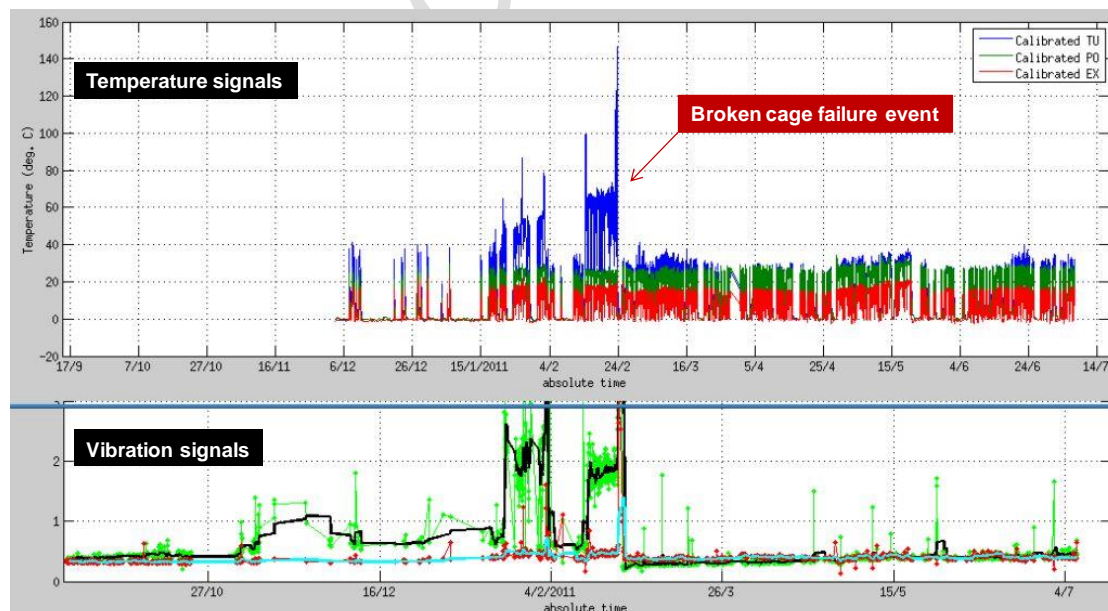
## Bearing condition monitoring using cheap temperature sensors: a cost-effective solution to industry

The POM2 project (Prognostics for Optimal Maintenance, [www.pom2sbo.org](http://www.pom2sbo.org)), aims to develop an integrated methodology for implementing **Predictive Maintenance (PdM)** on industrial machines and software tools / algorithms to support the assessment of cost / benefits ratio of the predictive maintenance.

In this context, cost-effective **Condition Monitoring (CM)** systems are needed to adopt practically a **Predictive Maintenance (PdM)** program in an industry. Temperature sensors are cost-effective widely used sensors in different industrial applications to monitor the condition of the machines or production processes or used as inputs to control a system or a process. The industrial version of these sensors is very robust and provides reliable information.

The use of these sensors in PdM program makes an online monitoring of a machine or a process practically possible as the total cost of implementing such monitoring systems is realistically possible.

In this article, we will show how the temperature sensors can be used for PdM of bearings in industrial machines. In a previous Techniline article, it has been showed that condition monitoring using accelerometers could perfectly predict a catastrophic failure of a bearing (broken cage) almost 400 operational hours (couple of months) in advance. The same set-up was equipped with cheap temperature sensors (1/100 of accelerometers price) that are used to monitor the same fault / failure evolution versus time. The results are shown in the graph below. The temperature monitoring the faulty bearing side (blue line) showed clear increase in amplitudes compared to the calibrated temperature of the machine in normal condition (which is maximally ~40°C). This increase starts even couple of months in advance before the failure occurs.



This case study shows clearly the potential of temperature condition monitoring to be used in a PdM program in order to predict serious industrial failures enough time in advance in order to perform a relevant maintenance actions. The price of such monitoring systems is the



driving factor to convince industrial managers to adopt this kind of Pdm instead of the current way of practices.

[1] Techniline article



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