

Topic :

SITCE Presentation Abstract: Predictive maintenance and EAM for improved reliability.

Abstract :

Traditional preventive maintenance approach assumes a failure pattern increases with age or use and maintenance routines are applied in an expected timely manner to minimise risk of failure. In reality this in general applies to only 18 percent of assets. The other 82 percent of assets display more random failure patterns.

It is to bridge this that condition monitoring is employed to monitor equipment and processes in near real-time to early identify, and in an extension, predict failures of critical equipment.

The use of condition monitoring in many cases allows for early detection of an impending fault. The condition data has in past been analysed by reliability engineers to determine the need for maintenance before it results in a functional failure. With the development of machine learning and AI technologies there is now the ability to not only predict the regression based on the condition alone, but to overtime build a complex repository of factors that affect the rate of the regression. This allows not only for a more accurate but longer term analysis of expected fault.

A recent implementation of sensors for condition monitoring for one of our bus clients collected 10 million datapoints per bus per day. For a fleet of a 100 buses this adds up to 365 Billion data points per year.

The volume of data quickly becomes unmanageable for human analysis. In addition to this a comprehensive predictive model could include data from external sources such as weather and seasonality, maintenance history.

The predictive analysis of condition data was automated and integrated with Trapeze EAM system to ensure efficient maintenance processes and to provide feedback loop of maintenance data for the machine learning.

Significant efficiency gains from adopting condition monitoring for fault prediction could be reported with recent results showing:

- 50% less time spent on diagnostics
- 24% less material costs
- 30% less road calls due to breakdowns.