

Predicting compressor failures

Predicting compressor failure reduces operational costs



Our Client

Multi-national Industrial Gas and Chemicals company who supply to a range of manufacturing sectors.

The Problem

Our client operates and maintains a fleet of high value remote Air Separation Units (ASU). Failure of the air compressor(s) would mean a production shutdown, potentially a failure to supply to their customer and expensive replacement of equipment which would typically be on a long lead time. High vibration set-point alarms were un-reliable and typically ignored. The seemingly unpredictable nature of the compressor failures increased operational costs significantly (in excess of £80k per incident).

The Solution

By analysing vibration data from a failed compressor and applying appropriate statistical analysis techniques, TR Control Solutions were able to identify early indication of compressor failure (deviation from process control) up to 3 months before the event. As part of a systematic asset performance management programme automated analysis of vibration data was deployed to monitor all applicable compressors. Early notification of predicted failure is directed to the maintenance team.

The Benefits

The system has identified a number of compressors displaying deviation from control. On average 3+ failures would occur each year but where the system has been deployed there were no unpredicted failures. The early warning allows maintenance teams to plan preventative maintenance which is much lower cost and has minimal operational disruption.

The Detail

An industrial gas and chemical company owns, operates and maintains a fleet of high value Air Separation Units which supply industrial gasses to various manufacturing processes. In the event of an ASU failure supply can be maintained from a backup store of liquefied gas. However liquefied gas costs are much higher.

A cause of shut down is compressor failure, an issue our customer experienced a number of times a year. Compressor failure is destructive causing mechanical damage and replacements on long lead times (up to 6 weeks). Prolonged periods of backup supply and maintenance costs can easily exceed £80k per incident.

Set-point alarms had been configured on the local HMI but they were unreliable, persistent and eventually ignored (the set-point was moved higher and higher).

Working with our customer we analysed several months of data from failed compressors. Applying statistical analysis techniques we were able to detect indications of failure up to 3 months in advance.

We implemented a system which collects vibration data and applies statistical analysis calculations to it. If the vibrations are deemed to be deviating from control an email notification is sent to the maintenance team who can view live and historical trend data from the system (vibration, temperatures, pressures etc.) to aid their diagnosis and plan preventative maintenance within scheduled shut-downs.

Using the system as part of a systematic strategy has enabled our customer to reduce unpredicted compressor failures to near zero.



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