

PeakVue™ Technology Helps Dolphin Energy Identify Motor Bearing Faults and Improve Lubrication

RESULTS

- Prevented unexpected breakdowns through early identification of defective motor bearings
- Initiated new PM strategy for optimum greasing of motors
- Extended bearing life with proper lubrication
- Reduced maintenance costs by optimizing PM schedules

APPLICATION

More than 1,600 electric motors receive periodic offline condition monitoring.

CUSTOMER

Dolphin Energy Limited, Doha, Qatar, began gas production in July 2007 under a unique energy initiative for the production and processing of natural gas from Qatar's offshore North Field as well as transportation of the processed gas by subsea pipeline to the United Arab Emirates (UAE) and Oman.

CHALLENGE

Determining the proper greasing schedule for electric motors has been difficult in a plant with hundreds of motors made by different manufacturers and having different power ratings. Suggested lubrication intervals varied by manufacturer, while variations in motor loadings, start-stop frequencies, and operating environments impacted preventive maintenance (PM) in a variety of ways:

- Time-based greasing did not account for machinery operating hours
- The PM plan did not address equipment run outside its operating range
- Amount of grease for each bearing was not always based on machine configuration, speed, service severity, and operating environment
- Amount of grease applied each time varied from person to person
- It was difficult to readjust lubrication plans following motor overhauls



“PeakVue spectrum analysis and impacting enable us to differentiate between lack of lubrication and defective bearings.”

Krishna Nangare
Condition Monitoring Engineer
Dolphin Energy Ltd.

Some bearings were over-greased, some did not receive enough lubricant, and premature bearing failures were encountered. A revised PM plan was needed to cover the wide variations in motors and operations.

SOLUTION

Offline vibration monitoring is used extensively on more than 1,600 electric motors as a primary means of identifying defective motor bearings as well as adjusting PM schedules. Readings are taken monthly using a machinery health analyzer on all rotating equipment considered “vital” to ongoing operations. Data are collected every other month on “critical” machines, and quarterly on all other equipment. Vibration data are analyzed using Emerson’s AMS Machinery Manager predictive maintenance software.

Using PeakVue™ technology, plant personnel are able to isolate high frequency “impacting” faults, where metal contacts metal within gears and/or rolling-element bearings. Impacting faults are readily visible in the PeakVue waveform long before there is any significant increase in overall vibration.

According to Krishna Nangare, condition monitoring engineer, “PeakVue trends are checked constantly, so changing values get our attention very quickly. An increase in G-level or impact level is cause for ongoing auto-correlation analysis in TWF to see if the energy is harmonics-related or due to random noise. This additional information enables us to differentiate bearing faults from lubrication issues.”

If the auto-correlation shows the energy is primarily due to random noise, the motor is greased and new vibration readings are taken. In over 90 percent of these cases, levels are all subsequently reduced. If the auto-correlation shows energy related to harmonic signals and a bearing fault frequency match is observed in the PeakVue spectrum, that motor is scheduled for bearing replacement. In over 99 percent of such cases, follow-up data show that the levels have returned to normal.

Maintenance personnel are using the information developed through vibration monitoring and analysis to establish more effective PM schedules to meet the needs of each motor.

“We use Emerson’s PeakVue technology extensively to judge under-lubrication and detect defective bearings.”

Krishna Nangare
Condition Monitoring Engineer
Dolphin Energy Ltd.

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