

## Remote Analysis Catches Imminent Failure Just In Time

Vibration data collected from a newly installed motor on a major industrial gas plant's critical main air compressor showed unusually high readings. This was of great concern because the motor was the site's only spare and had been installed because the previous motor was out for repair.

An analyst in South Carolina was remotely reviewing the plant's data via the cloud. Data had been collected in North Carolina with a vibration analyzer that transfers data via the cloud for analysis. The analyst noticed that at higher speeds, the amplitude of the vibration was much larger than it should be. The frequency of the energy was twice the running speed of the machine, a common indication of misalignment.

To confirm his diagnosis, the analyst asked the plant's staff to immediately collect two more sets of data with the handheld vibration data collector and upload to him for review. He requested one set be taken with the motor running uncoupled and one with it running coupled to the compressor, but with no load. In a misalignment situation, the removal of load usually restores vibration to normal ranges.



The analyst reviewed the data as soon as it was posted and saw what he expected – no sign of the misalignment. As a final test, the analyst asked for more data, this time with the compressor fully loaded. If there was an alignment issue, the load would trigger the same vibration increases he saw when he first made his diagnosis.

As he expected, the new data confirmed the misalignment and the analyst recommended the motor be aligned promptly. Plant staff followed his advice and found the motor to be substantially misaligned. The motor would most likely have failed within 24 hours without the alignment.

New data showed the repair eliminated the high vibration with a full load. As a precaution, the analyst recommended plant staff send him weekly data sets for the next month. If the misalignment had damaged the bearings, the data would start revealing such damage over the next few weeks.

No bearing issues were detected and the motor remains problem free.

In this case, time was of the essence. The analyst received multiple sets of data and diagnosed the root cause within a 24-hour period.

Had the problem not been identified quickly, the motor would have failed. It would have taken several days to locate, deliver, and install a new one. It is estimated that new equipment, associated downtime, trucking costs, and customer fees for missed deliveries could have topped \$1 million.

Technology was the key to the analyst being able to work quickly and remotely. Plant staff uploaded data via the cloud and the analyst reviewed it and issued timely, actionable advice from miles away. If there had been no alternative to bringing an analyst on site, the machine may have failed with the analyst in transit.

This intervention on a single piece of equipment saved the company more than the total annual cost of its reliability program across 100 of its plants.