



Machinery Diagnostics & Troubleshooting

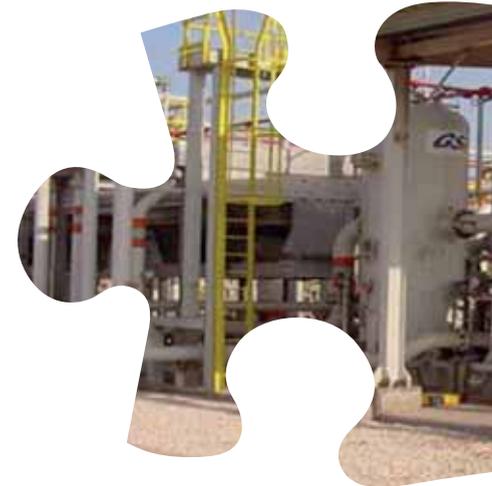
Assessing potential technical issues with rotating equipment prior to commissioning

BUSINESS CHALLENGE

In today's business environment, misalignment or imbalance of rotating equipment jeopardizes plant integrity and can increase your operating costs.

Research shows that loads on mechanical parts (i.e., bearings, seals, couplings) are significantly increased as a result of relatively small amounts of misalignment or imbalance. These increased loads in turn result in elevated operating temperatures, noise levels and rates of wear, causing:

- Increased energy consumption
- Reduced operational efficiency
- Shortened component life (premature failure)



SOLUTION

What is Machinery Diagnostics and Troubleshooting?

By providing machinery acceptance testing services, Bureau Veritas can assess equipment's dynamic performance features. Measurement and detailed analysis of machinery vibration characteristics during commissioning provides invaluable insight into the existence of any intrinsic problems.

What are the key benefits?

- Provide confidence in sustained trouble-free use.
- When inherent defects are identified, accurate diagnosis can be made, enabling the planning of necessary remedial work during the commissioning process and prior to acceptance of equipment by the operator.
- On the other hand, if assessment establishes that machinery is in an acceptable mechanical condition for handover, the vibration measurements taken provide a convenient baseline data set to support a future predictive maintenance (condition monitoring) program.

WHY CHOOSE BUREAU VERITAS ?

Recognition ■ Founded in 1828, Bureau Veritas is a worldwide leader specialized in QHSE and social responsibility services. It is certified to ISO 9001 for all of its activities worldwide.

Knowledge and expertise ■ Our qualified local teams are experts at with inspecting all kinds of supplies: materials and components, pressure equipment, mechanical equipment and machinery, electrical equipment.

Network ■ With more than 26,000 employees in 700 offices and laboratories covering 140 countries, Bureau Veritas is able to act quickly on its clients' behalf anywhere in the world.

RELATED SERVICES

- Equipment criticality audits
- Maintenance strategy development
- Specification of monitoring equipment
- C.M. program set up and implementation
- Routine data collection & analysis
- In-situ balancing
- Lube oil analysis
- Independent commissioning and witness testing
- C.M. training courses
- Laser alignment services
- Root cause failure analysis
- Noise and vibration surveys



**BUREAU
VERITAS**

Move Forward with Confidence



OUR APPROACH

Bureau Veritas undertakes machinery assessment and testing services to identify and resolve any defect related to:

- Components
- Manufacturing process
- Equipment installation
- Equipment associated protection systems.

In addition, Bureau Veritas provides:

- Supervision of remedial in-situ dynamic balancing or realignment;
- Independent calibration and/or set-up of permanently installed API vibration and temperature protection systems;
- Definition and mapping of the onset of compressor surge conditions to support control system configuration.

FAQ

Can we use our own technicians to carry out routine surveys and use Bureau Veritas for analysis & reporting?

Yes, Bureau Veritas can offer training to enable the client to carry out vibration surveys and to perform first pass analysis while offering to and provide backup and support for the more in depth analysis and reporting.

How much notice is required for the services on offer?

One- two days.

What areas do you cover?

Our services are available worldwide. We have presence in 140 countries with over 700 offices and laboratories.

CLIENT REFERENCES

Following a major overhaul of an RB211 driven export gas compressor, excessive vibration was experienced at the power turbine pedestal bearing, preventing the machine from reaching its operating speed. A number of invasive inspections carried out by the machinery vendor had failed to isolate the source of the problem. Measurement and subsequent analysis of steady state and transient vibration data from the unit identified:

- The existence of a dominant vibration component at 1 x power turbine rotational speed, subsequently confirmed (via analysis of phase data) to be caused by rotor imbalance;
- The close proximity of the 1st critical speed of the unit to the idle speed of the power turbine;
- High slow roll run out levels, notably at the probe track required for dynamic balancing.

Discussions with the test shop engineer who had passed the turbine as being fit for service revealed that the unit had a history of electrical run out problems. Taking this into account, it was possible to implement the necessary corrective trim balance of the machine, after which the required compressor operating speed was successfully attained. A comprehensive machinery acceptance test report was issued and local machinery operators advised of recommended changes to unit operating and monitoring practices in order to avoid any future problems.

▶ CONTACT

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▶ FOR MORE INFORMATION

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