



CONDITION MONITORING SERVICES

STATE-OF-THE-ART-TECHNIQUES OPTIMISING
PRODUCTIVITY AND REDUCING MAINTENANCE COSTS

- *Detect impending failures – so that timely, planned maintenance can be scheduled before they lead to failure and unplanned downtime.*
- *Reduced periodic maintenance – through reliable knowledge of a machine's health.*
- *Identify maintenance priorities – critical before a planned shutdown when there are pressures on time and resources.*
- *Understanding the underlying cause of persistent problems – allowing effective solutions to be put in place.*



Effective condition monitoring programmes optimise plant asset efficiency, help avoid costly production outages and provide valuable decision-making support to the maintenance function.

AV Technology (AVT) is a test and measurement consultancy, established in 1976. An independent company specialising in the fields of: condition and structural monitoring and noise and vibration consultancy.

We operate an ISO 9001:2000 approved QA system and apply a strict health and safety policy. AVT is part of the Ionix Group of companies.

We employ a range of state-of-the-art Condition Monitoring (CM) techniques that can determine the condition of equipment and components as they operate. Applying our technology and expertise we can identify underlying and developing failures, reduce maintenance costs and optimize availability and productivity. Applied individually or collectively the following techniques and services provide a valuable insight into your plants' condition and reliability:-

- Vibration Analysis and Routine CM Surveys
- Infrared Thermal Imaging
- Lube-Oil Analysis
- Ultrasonic Acoustic Inspection
- Vibration Troubleshooting
- Maintenance Consultancy

DELIVERING VALUE

With our sophisticated CM techniques we have helped customers to benefit from:

- Fewer breakdowns as a result of proactive detection of impending failures
- Greater productivity through enhanced uptime
- Reduced costs through better planning and scheduling of maintenance, and confidence to extend maintenance intervals
- Superior equipment performance by means of the rapid diagnosis of machine inefficiencies and faults
- Prolonged machine life through optimized maintenance scheduling
- Higher product quality resulting from optimal machine performance
- Reduced energy costs through the identification of heat losses or system leaks
- Increased safety through improved plant integrity
- Reduced or deferred capital expenditure through superior asset utilization

We maintain leading-edge practices through the development, implementation and use of process maps, ISO standards and an ISO standard complaint management system.

VIBRATION ANALYSIS AND ROUTINE CM SURVEYS

All rotating equipment has a vibration signature. Understanding how that signature relates to machine condition and performance is critical to any worthwhile vibration analysis service. We take condition monitoring the critical step beyond analysis to valuable diagnosis and prognosis. Vibration analysis involves the periodic measurement of machine vibration from either machine bearing housings, supervisory panels or other permanently installed sensors. The following range of machine faults and reliability problems can be identified:

- Bearing defects
- Misalignment
- Imbalance
- Soft foot
- Mechanical looseness
- Resonance
- Bearing pre-loads and incorrect assembly.
- Gear mesh abnormalities
- Journal bearing faults
- Belt drive faults
- Pump cavitations and process flow problems
- Beat frequencies

INFRARED THERMAL IMAGING

Many failure processes generate excess heat. By measuring the intensity of the infrared radiation emitted by your plant, our experienced engineers can uncover valuable information about your plants' operating condition. For example, infrared thermal imaging can be used to identify:

- Hot joints caused by faulty connections in electrical circuits
- Insulation degradation that could lead to costly heat losses
- Misalignment of bearings and gears
- Incorrect installation or poor lubrication of bearings.
- Electrical phase imbalance that can lead to power loss in electrical motors
- Blockages and dead spots in circulation systems such as the cooling tubes of heat exchangers without cracking lines.





LUBE-OIL ANALYSIS

With AVT's managed lube-oil analysis service, you can have additional warning of imminent machinery failure. Analysis of oil taken from plant machinery has proved to be one of the most effective ways of trending wear and determining wear-particle origin. By analyzing the condition of wear particles, the root cause of wear can often be identified and preventive steps can be taken. For example, lube-oil analysis can be used to identify:

- Coolant leaks and external material ingress – contaminating the lubricant.
- Engine or transmission wear – from particulates and fuel leakages
- Combustion problems – through high soot content
- Product contamination – compressor flash point values

Moreover, because an aged lubricant damages machinery instead of protecting it, lube-oil analysis also reveals the condition of the oil and helps to optimise service intervals.



ULTRASONIC ACOUSTIC INSPECTION

This inspection technique involves the detection of high frequency noise and has many applications across both static and rotating plant. Ultrasonic acoustic inspection can be used to identify steam and air systems leaks saving energy costs and also enables the identification of bearing defects on highly critical slow speed machines, where vibration signals are often suppressed and grease samples are unobtainable. In summary, ultrasonic acoustic inspections can be used to identify:

- Compressed air and steam system leaks
- Bearing defects on slow speed critical machines
- Faulty transformers, switchgear and other electrical discharge problems
- Faulty steam traps, pressure relief and non-return valves

VIBRATION TROUBLESHOOTING

A complete condition monitoring programme is based upon a strategy of detection, analysis and rectification. Straightforward machine faults can be detected by routine vibration analysis surveys. By contrast, sophisticated equipment and troubleshooting techniques need to be used for more complex faults. AVT have considerable experience in vibration troubleshooting and complex turbo-machinery problem diagnosis, gained over many years working with major blue chip companies. This background enables us to provide competent and experienced engineers to help resolve machinery issues such as:

- Single and multi-plane in-situ balancing
- Complex machine investigations and problem solving
- Turbo-machinery start-up / shutdowns and troubleshooting
- Machine baseline and acceptance testing
- 3rd party witnessing
- Failure investigation and warranty issues
- Structural and modal analysis investigations
- Compressor performance testing
- Machinery protection panel calibration checks

MAINTENANCE CONSULTANCY

AVT also provide a range maintenance consultancy services linked to our condition monitoring activities including:

- Plant criticality assessments
- Maintenance strategy development
- CM programme design, implementation, development and support
- Root cause failure analysis
- Training courses

These services compliment the fluid management, integrated maintenance and reliability solutions provided by our sister company Asset Maintenance Solutions (AMS).

To find out how AVT can create a competitive advantage for your organisation please contact us on:

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