



MAINTENANCE+

ASSET PERFORMANCE MANAGEMENT FOR ROTATING MACHINES

Unexpected Failure of Electric Rotating Machines (motors and generators) can become a highly costly event with associated downtime, production disruption and unsafe conditions.

How can we help?

As part of the Maintenance+ offering, our Asset Performance Management (APM) solution helps to improve asset reliability, availability, schedule maintenance and reduce downtime.

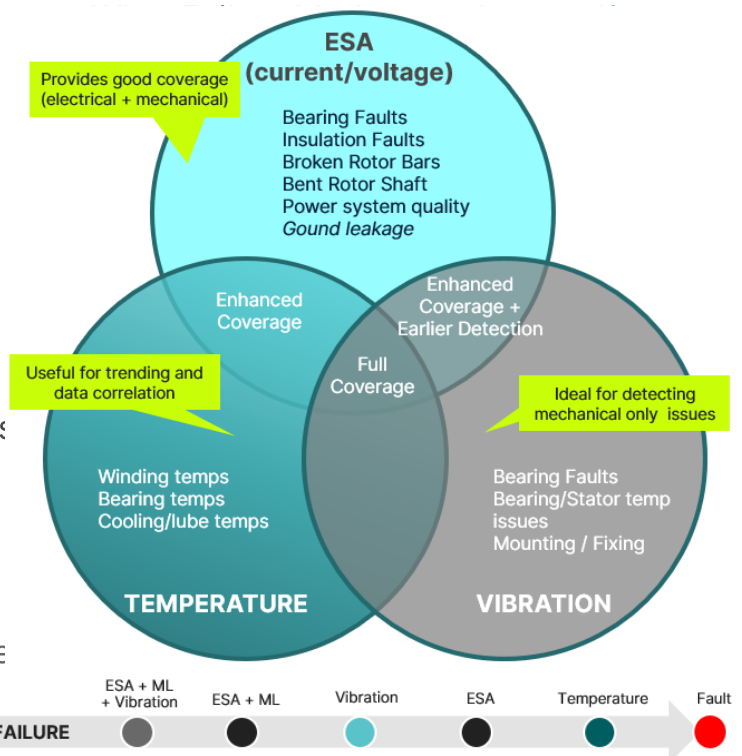
Detecting early degradations and performance problems is possible while your asset is in service (online), by using methods based on rotating machine Electrical Signature Analysis (ESA), predicting failures on critical assets in time for them to be avoided or, at least, mitigated:

- A wide range of mechanical and electrical degradations can be detected as compared to vibration or temperature monitoring only.
- No additional sensors are required, except CTs, VT/PTs.
- High fidelity power system waveforms are taken from the motor/control cabinet.
- The Rotating Machines Health is continuously monitored. No need to stop operations to assess the machine condition.

Anomaly detection powered by machine learning (ML) is also part of the solution, uncovering hidden patterns and identifying additional issues.

What are the Benefits of the Solution?

- Increased operations predictability and asset availability.
- Enabling timely corrective actions.
- Mitigate the impact of failure and repair or replacement costs.
- Contribute to avoidance of unplanned downtime and enable prevention of safety issues.





Parameters monitored

<p>Electrical Faults</p> <ul style="list-style-type: none"> Negative Seq. Current Negative Seq. Voltage* Stator Faults Rotor Faults Stator insulation degradation** <p>* Need both voltage and current signature analysis ** Adding online partial discharge detectors to the system</p>	<p>Mechanical Faults</p> <ul style="list-style-type: none"> Mixed Eccentricity Gearbox issues Coupling/ Bearing/Vibration (FTT) Bearing Faults (ball/roller) Outer/ Inner race Ball/ Bearing Fault Bearing Faults (thrust/sleeve)
<p>Electric Supply - KPIs</p> <p>KPI -Frequency, Current RMS, Voltage RMS, Negative sequence current and voltage, Active power, Reactive Power ,Total power, PF, dv/dt at the point of sampling, Estimated speed</p>	
<p>Anomaly Detection (ML)</p> <ul style="list-style-type: none"> - With Individual asset baselining - In comparison to a healthy asset 	

Options To Meet Multiple Topologies

Power Conversion Drive as a Sensor

GE drives: Installation requires minimal hardware .

RMDM panel, (if no Power Conversion drive available)

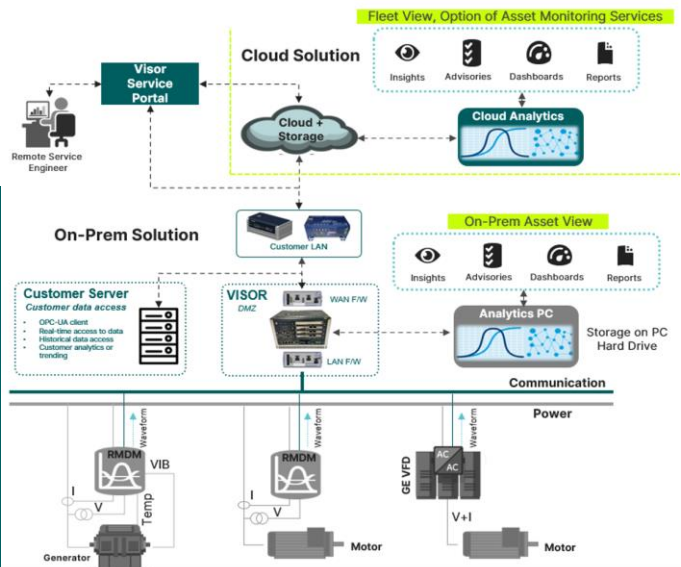
Rotating Machine Diagnostics Module in a cabinet or plate

Cloud (remote) or On-Prem (local) solution available

Supporting Maintenance Management and Reducing Unplanned Downtime

- Medium voltage (MV), low voltage (LV) electrical rotating machine with fixed speed or variable speed converter fed.

Typical Architecture



HIGHLIGHTS

- Non-invasive method of detecting issues with no modification required on the rotating machine.
- Support to Medium voltage (MV) and low voltage (LV) electrical rotating machines
- Scalable solution, that can be applied to up to 40 electrical rotating machines simultaneously.
- Flexibility integrating 3rd party sensors to address specific failure modes

CONTACT US

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