

Remote Monitoring & Diagnostics (RM&D)

Turbomachinery and peripheral equipment for oil and gas applications must operate within specified parameters in order to achieve desired performance, production targets and cost control. Traditional monitoring methods require on-site personnel and analysis, with periodic OEM engineering support. GE's RM&D service offers the superior alternative of continuous monitoring by expert engineers with significantly enhanced response times – and without additional on-site staffing costs or logistics.

How it works

Our standard monitoring instruments (for temperature, pressure, vibration, etc.) are supplemented with a Site Connectivity Kit so that operating data can be securely accessed by our proprietary satellite acquisition system. Instrumentation is linked to our Florence headquarters where a dedicated team of diagnostics engineers evaluates actual and target statistics, as well as interrelationships between components, to continuously monitor performance and safety parameters. They then work with your staff to support on-site activities – ranging from detailed optimization plans through to immediate emergency procedures.

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GE
Oil & Gas



Remote Monitoring & Diagnostics

24-hour expert surveillance for optimized machine performance, maintenance and safety



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Maximizing asset value

Any equipment damage or emergency shutdown can be extremely dangerous and costly to the overall operation – where a single hour of downtime can cost tens of thousands of dollars.

GE's RM&D service provides an additional layer of security that can improve daily maintenance and operating performance – to minimize downtime and help prevent unexpected failure.

Comprehensive monitoring

RM&D solutions can dramatically improve your machine performance, enhance your plant efficiency and availability, reduce maintenance costs and minimize downtime. The service gives oil and gas operators the advantage of around-the-clock monitoring by expert engineers specializing in the equipment and processes being monitored.

Minimal expense is required since most of the equipment involved either remains GE's responsibility or is leased to the customer under the service contract.

The end benefit is finely tuned equipment for optimized productivity, machine availability and maintenance costs. Ongoing service solutions include:

- Enhanced machine availability
- Troubleshooting help
- Combustion system tuning
- Performance tuning based on actual operating conditions and expected behavior
- Maintenance optimization using real operating data
- Quantitative evaluation of maintenance activities
- Cross-fleet analysis

Measurement and analysis

The process begins with advanced field data collection, gathering critical data on all contributing factors in order to:

- Monitor machine performance
- Monitor operating conditions
- Measure maintenance impact
- Record events, failures, damage
- Identify critical components
- Assess remaining life of key components

Specialized GE diagnostic engineers analyze the data and provide specific information to guide decisions that will optimize the productivity and value of all machinery. Activities include:

- Field data analysis
- Critical component analysis
- Early detection, notification and resolution support
- Periodic reports on machine condition and maintenance recommendations
- Identification of components responsible for performance loss
- Maintenance plan analysis

Worldwide reach

GE's proprietary remote data acquisition system uses satellite and high-speed internet communications to gather and analyze a huge volume of data in real time from any location in the world.

The dedicated on-site tools comprise instrumentation and communication hardware and software specifically developed by GE for all oil and gas machines and plant components.

The level of detail we can obtain and monitor remotely from our Florence diagnostic center will enable:

- Highlighting potential or incipient failures using customized diagnostic rules
- Tracking the performance of machine and plant components during plant operation
- Sustaining overall efficiencies and maximizing machinery productivity
- Machinery troubleshooting assistance, linking the plant machinery with the original equipment manufacturer
- Customized maintenance intervals by analysis that integrates thermodynamic, metallurgical and mechanical data at operating conditions

Fast-track resolution

Whether monitored variances warrant recommendations of maintenance or emergency shut-down, your team is always aware of the situation. We provide tailored reports at specified intervals, 24-hour troubleshooting access and highly focused, emergency mitigation procedures.

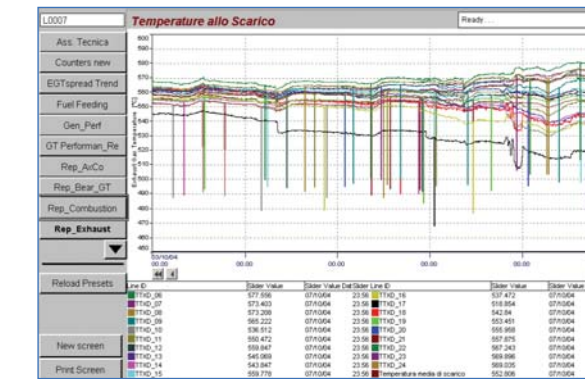
Key benefits

- Monitoring and analysis work is carried out by GE's expert personnel, so you can count on consistent, high-quality service from one of the world's technology leaders
- The entire process is smooth and simple for your people – no more long waits for tune-up teams, and no disruption at your workplace
- Shared technology enables your plant personnel to achieve higher levels of performance for combustion efficiency and emissions control
- Continuous monitoring provides a basis for ongoing optimization of turbine performance

Case study A

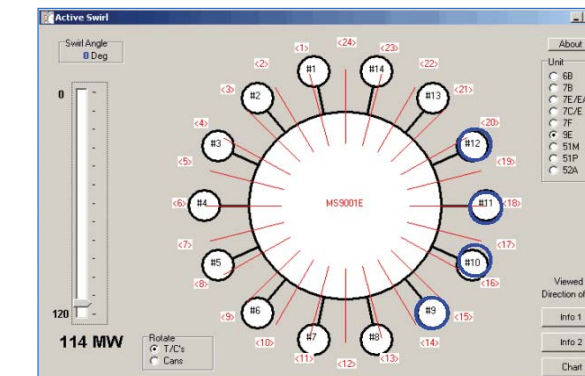
We perform continuous RM&D services for a refinery customer using our Frame 9E DLN for power generation. More than 12 million individual data units are analyzed every year.

We identified a combustion problem associated with a high spread, immediately notified the customer and stopped the machine.



Real-time data visualisation showing unacceptable performance variance among 14 combustion chambers

Our remote diagnostic tools identified anomalous data for four of 14 combustion chambers; these four burners were responsible for the problem.

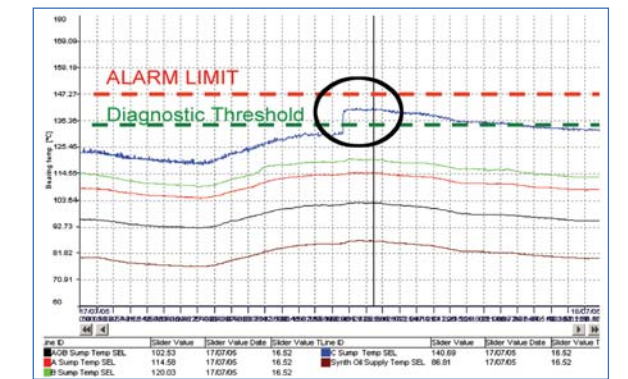


RM&D identified the four combustion chambers responsible for the high spread

Without this prompt intervention, the gas turbines would have tripped causing damage to critical components. RM&D saved approximately \$1 million in components and avoided 3 days of downtime.

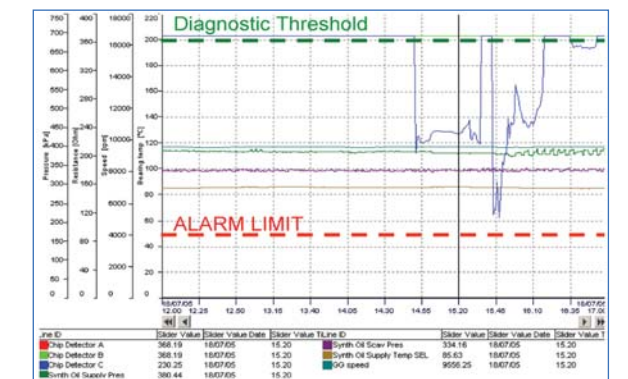
Case study B

A gas pipeline customer uses PGT25 for gas delivery. RM&D identified a sump temperature increase from 10-20° C within two months, and a C Sump temperature step change of 10° C within a few minutes.



Our RM&D team identified dangerous temperature fluctuations that would have eluded the machine's alarm limit

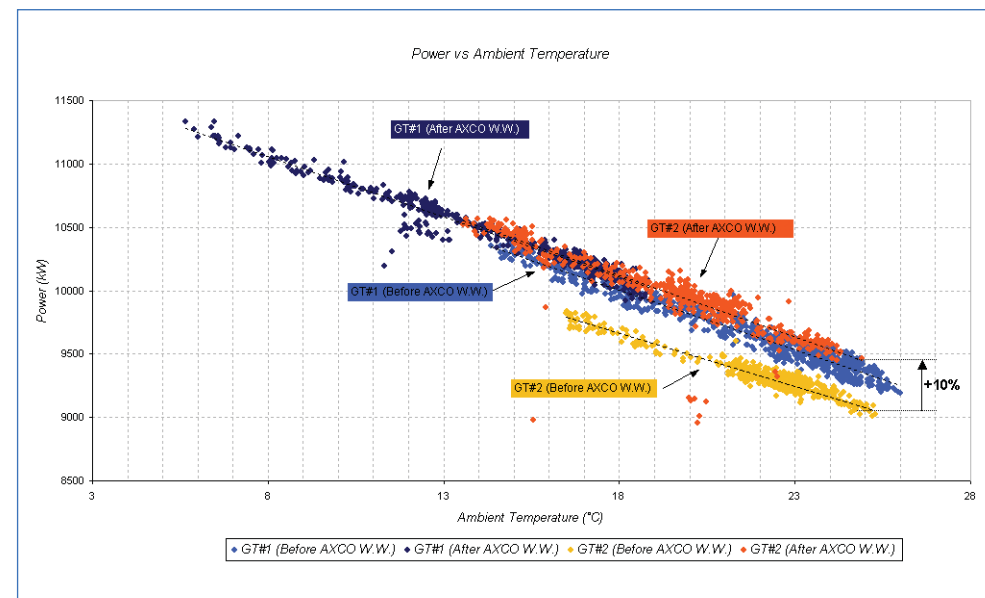
The C Chip detector also showed low resistance values. We determined remotely that there was an incipient failure on bearing #5 and called the customer in order to initiate remedial measures.



Deficient resistance values were also recognized by RM&D before they were evident on-site

Proactive shut-down prevented heavier damage (rotating seal failure, damage to stage 1 and 2 blading), avoiding lengthy downtime and saving up to \$600,000 in turbine parts.

Converting Data into Customer Value



Remote monitoring display of Power vs. Ambient temperature

