



GENERATOR SERVICE SOLUTIONS | SOFTWARE SOLUTIONS

# Generator Health Monitoring



A comprehensive approach to generator condition assessment enabling predictive maintenance.

## About Generator Health Monitoring

Successfully managing a power plant in today's competitive industry means controlling the risk of failures and unplanned downtime by making smart decisions based on more accurate operational and inspection data.

Generator Health Monitoring (GHM) is a fully integrated and modular on line monitoring suite available for any type of generator that allows continuous condition assessment and the earliest identification of any evolving issues.

With GHM solutions you will be able to implement, a cost-effective, condition-based maintenance strategy that increases reliability and availability, while allowing improved outage planning and lifetime extension of the plant's equipment while reducing maintenance costs.

## Service Levels

### Level 2 GOLD\* Service

GE's periodical on line monitoring service allows you to cost-effectively assess the condition of your generator, for any OEM. It involves the installation of permanent sensors, followed by twice-yearly measurements and an expert report, allowing you to make informed decisions about your planned maintenance.

### Level 3 Service

With our continuous on line monitoring suite, operators will benefit from on-site trending as well as comprehensive half-yearly reports, including recommendations to mitigate any risk of failure and to improve outage planning.

### Level 4 Remote Service

For the highest level of assurance, we propose our remote service. This service includes a permanent remote data link to GE's Remote Monitoring Center, allowing weekly checks as well as quarterly full reports—ensuring the earliest identification of any evolving issue.

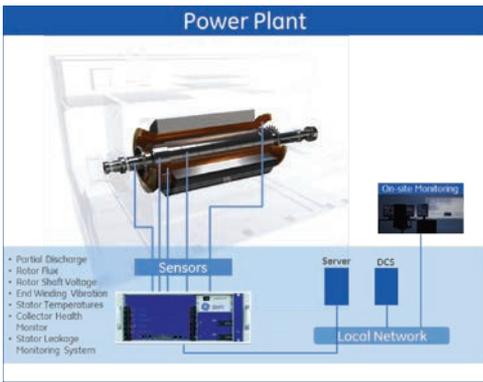


Figure 1 GHM Level 4 Remote Service Setup

- Weekly checks
- Quarterly full reports
- Permanent data storage

## Data accessible at plant level with direct feed to GE

### Level 3 and Level 4 Monitoring Modules integrated in one Platform

The fully integrated platform is a modular system with a user-friendly, web-based interface. With one Care Box, instead of several standalone systems, any combination or all of the following generator parameters can be monitored in real time:

#### Modules

##### Partial Discharge (PD)

The PD module continuously monitors the partial discharges within the stator winding and bus duct.

##### Rotor Flux (RF)

The RF module measures the rotor slot magnetic flux from sensing coils at the air-gap between the stator and rotor.

##### Rotor Shaft Voltage (RSV)

The RSV module continuously monitors the shaft for induced voltage, plus inductive and capacitive disturbances.

##### End Winding Vibration (EWW)

The EWW module provides continuous monitoring of stator end winding vibrations.

##### Temperature

The Temperature module constantly monitors generator temperatures in line with operating conditions, trending deviations from design values.

#### Detection Capabilities

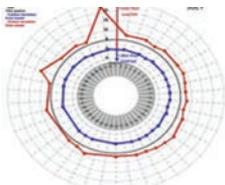
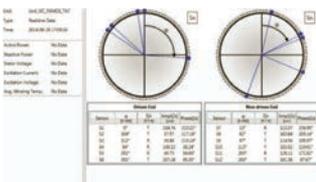
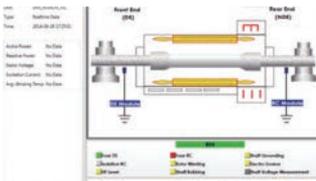
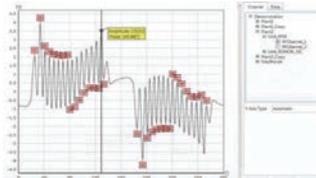
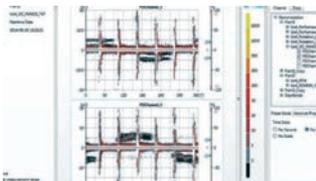
- Deterioration of stator winding insulation
- Contamination of generator and bus
- Semi-conductive coating deterioration

- More accurate detection and location of rotor winding short circuit problems
- Tracking of fault condition to support ongoing machine operation

- Shaft grounding quality monitoring
- Rotor rubbing, rotor inter-turn short circuits, bearing insulation status
- Electro-erosion (pitting)

- Deterioration in mechanical stiffness of overhang support
- Detection of any change in end winding vibration levels
- Phase measurement of the location and root cause analysis of the vibration level changes

- Blocked water cooled stator bars, stator cooling efficiency decrease, stator core defects
- H<sub>2</sub> cooler effectiveness



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GEA33616 (12/2017)