

GENERATION STEP UP (GSU) TRANSFORMER MANAGEMENT SYSTEMS (TMS)

FACT SHEET

Overview:

Many GSUs are approaching the end of their design life and are experiencing significantly higher probabilities of unexpected failures. When an unexpected failure of a GSU occurs the impact on the operation of the plant and on the business owner of the plant is dramatic.

To assist the owners with managing these assets and operational risk, GE has developed pre-packaged online Transformer Management Systems (TMS). These systems provide comprehensive monitoring with a range of sensors and add online condition analysis models to further assist the operators.

The TMS, with sensors such as the Hydran[®], are capable of monitoring and performing on-line analysis to detect the majority of prevalent failure modes other than instantaneous catastrophic events, such as lightning. In most cases, detection is possible before the unit experiences catastrophic failure, thus avoiding expensive replacement, clean-up costs, and unplanned downtime. Early detection and the possibility to extend transformer life through the use of aging equipment brings significant business and operational benefits.

Key Benefits:

- Reduce the probability of an unplanned outage with continuous condition monitoring
- Defer replacement costs while maintaining reduced probability of unexpected failures
- Optimize equipment life by monitoring cooling system performance
- Develop maintenance and repair plans based on actual conditions
- Mitigate risks for staff safety and environmental impacts
- Reduce maintenance and monitoring costs



Industry Recommendations to Reduce Probability of Unplanned Outages:

- **Establish preventive and predictive maintenance programs:**
 - Use actual condition information for maintenance and repair decisions
- **Implement comprehensive on-site condition assessment program:**
 - Parameters are recorded automatically saving time and preventing errors.
 - Measurements are made continuously with immediate alarms if applicable.
- **Consistently and effectively measure transformer's vital signs:**
 - The on-line system provides continuous measurement, trending and data storage.



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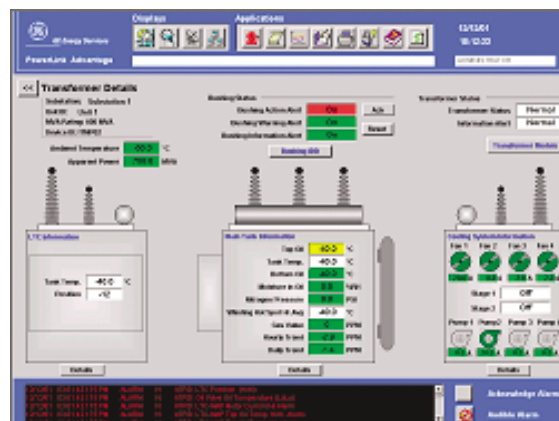
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Recommended GSU Solution

GE has defined a standard GSU TMS Package based on its existing FARADAY® iSM&D technology and comprising an integrated system of sensors, analysis models and data handling features to address the majority of prevalent failure modes. The TMS provides the asset manager with essential condition assessment tools to enable effective management and utilization of this critical plant component.

Package consists of:

- Smart on-line sensors such as the Hydran®
- Standard sensors
- FARADAY® iMEDIC
- PowerLink™ User Interface
- Communications options
- Commissioning (3 days included with each unit)
- Staff training (2 days) included for each purchase and not for each unit



Reduce the probability of an unplanned outage.

Other services offered by GE:

- Initial condition assessment
- Installation services
- Remote condition monitoring (on-line)



GE Power Systems

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Key Features

FARADAY iSM&D System with FARADAY iMEDIC + PowerLink

- Combustible gases sensor (Hydran)
- Top oil temperature sensor
- Load current CT
- Moisture in oil sensor
- Cooling system motor load current CTs
- Remote reporting of real-time data
- Alarm connection to DCS
- Local LCD display on unit
- Local data storage (30 days)
- Local communications to laptop at unit
- Analysis models
 - Winding hottest spot
 - Moisture in insulation system modeling
 - Bubbling temperature and margin
 - Insulation aging rate & cumulative aging
 - Cooling system efficiency
- Optional additional sensors (partial discharge, bushing)
- Flexible communications options
- PC Based user software
- SQL®/ODBC or OPC® interface
- Optional web viewing - enterprise wide
- Alarm notification by e-mail
- Optional secure support for Remote Condition Monitoring

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