

# Electrical Engineering Services

Commissioning, Testing &  
Condition Monitoring Services  
for High & Low Voltage  
Equipment





We utilise some of the most advanced and accurate test equipment available.



## Ensure your equipment is maintained with our inspection and testing services.

As a world-leading provider of testing, inspection and certification services with 140 years' experience, we offer you in-depth expertise to ensure your valuable equipment is maintained.

Our engineering services cover the commissioning of new plants and the preventative maintenance of existing plants. Our experts utilise some of the most advanced and accurate test equipment to conduct expert installation inspections and testing.

### Objective

We provide specialised testing, condition monitoring, research and analysis functions to our clients in accordance to all relevant statutory and customer requirements, standards, directives, specifications and procedures.

We have extensive worldwide backup service from discipline specific subject matter experts. All tests and services are tailor made to suit both customer and plant needs.

### Global Reach with Local Expertise

Leveraging the largest independent network of experts in the world, our experts speak the local language, understand the culture of the local market and operate globally in a consistent, reliable and cost-effective manner. Protect your brand, build customer trust and open the door to a more profitable business with industry solutions from SGS.

### Our Services

- Project Engineering and Consultancy Services
- Asset Management and Maintenance Planning
- Inspection and survey services.
- Equipment Failure Investigations
- Protective Relay Testing
- Substation and High Voltage Equipment Testing and Commissioning
- High Voltage Field Maintenance
- Partial Discharge and Corona Survey Inspections
- Thermographic Survey Inspections and Partial Discharge (Aquastic)
- High Voltage Cable Condition Assessments, including tan delta and partial discharge identification and location
- Transformer Insulating Oil Filtration, Reclamation and Oil Analysis.
- High Voltage Safety Equipment Testing and Certification
- Metering Equipment Calibration & Certification
- Infrared Thermography Devices Verification
- System Power and Harmonics Recording Services

SGS is the world's leading Testing, Inspection and Certification company. We operate a network of over 2,700 laboratories and business facilities across 119 countries, supported by a team of 99,250 dedicated professionals. With over 145 years of service excellence, we combine the precision and accuracy that define Swiss companies to help organizations achieve the highest standards of quality, safety and compliance.

### SGS Shutdown Capabilities

- Project Management Waterfall Hybrid led by PMP certified Project Managers with more than 20 years of Rapid Deployment projects and Shutdowns in Resources Industry and Heavy Industries
- Capability to mobilise large and highly specialised team with testing gear within short period of time
- Project planning, procedures and documentations including lessons learned
- Excellent record of delivering on time within the budget, maintaining the highest standard and without injuries or incidents

SGS

# Testing / Commissioning Capabilities



## Power Transformers (Periodical Testing & Operation Phase)

- DC Insulation, Dielectric Absorption & Polarisation Index
- Dielectric Insulation Power Factor (tan-delta)
- Excitation Current
- DC Winding Resistance
- Transformer Turns Ratio
- DIRANA
- Impedance
- Zero Sequence Impedance
- Polarity (Vector Group)
- Sweep Frequency Response Analysis
- Verification and Calibration of all Ancillary Devices
- Partial Discharge

## Regulating Apparatus (Load Tap Changers & Step Voltage Regulators)

- Insulation and Winding Resistance
- Insulation Power Factor
- Turns Ratio

## Switchgear and Switchboard Assemblies

- Inter-cell Connection Resistances
- Internal Ohmic Measurements

## Circuit Breakers and Switches (Air, Vacuum, SF6 and Oil)

- Insulation and Contact Resistance
- Over Potential, Test & Close Coil Tests
- Online Partial Discharge
- Dielectric Insulation

## PPE Testing & Meter Calibration

- Calibration of Meters
- Periodical PPE Testing Condition Monitoring Services

## Surge Arresters

- Dielectric Insulation

## Instrument Transformers (Current Transformers, Voltage Transformers & Metering Units):

- Insulation Resistance
- Polarity and Ratio
- Dielectric Withstand
- Insulation Power Factor or Dissipation Factor

## Capacitors

- Insulation Resistance
- Capacitance
- Resistance of Internal Discharge Resistors

## Reactors

- Insulation and Winding Resistance
- Over Potential Tests
- Power Factor

## Outdoor Bus Structures

- Low Resistance Continuity Tests
- Over Potential and Continuity Tests

## Grounding Systems (Earth Mats, Neutral Earthing Compensators / Resistors)

- Fall-of-Potential
- Point-to-Point Continuity
- Continuity Testing
- Earth Resistance
- Step and Touch

## High Voltage Power Cables

- 0.1Hz VLF and Corona Survey
- Tan  $\delta$  Condition Assessments
- Partial Discharge Testing

## Condition Monitoring

- Thermography and Partial Discharge
- Corona and Acoustic Survey

## DC Systems (Batteries, Lead Acid and Nickel Cadmium Chargers):

- Inter cell connection resistances
- Internal ohmic measurements

## Protective Relay Testing:

- Protection Systems Primary & Secondary Testing
- Fault Studies, Power System Protection, Grading Coordination Studies and Audits
- Protection Relay Configuration, Testing, & Calibration
  - Electromechanical
  - Solid State
  - Micro Processor Controlled
- Communications and SCADA Systems

## Emergency Systems

- Uninterruptible Power Supplies
- Generators
- Automatic Transfer Switches

## Rotating Machinery

- AC Induction Motors & Generators
- Synchronous Motors & Generators

## Motor Control

- Motor Starters
- Motor Control Centres

# When you need to be sure

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The SGS logo, consisting of the letters 'SGS' in a bold, sans-serif font, with a vertical orange line to the right of the letters.