CAPABILITY STATEMENT
HIGH VOLTAGE TESTING

PRODUCT BROCHURE

Our High Voltage Testing team offers a range of services related to the testing, repair and life-cycle management of high voltage assets such as transformers, motors, generators and rotating plants.

As high voltage assets are vital infrastructure, their reliability is of paramount importance. Our comprehensive assistance to plant and asset owners in the areas of asset management systems, condition monitoring and condition and life assessment facilitates the economic and safe operation of these critical assets.

TEST LEVELS

Our extensive high voltage test capabilities are aligned with the requirements of generation and transmission clients. Verico has test equipment covering a wide range of voltage and current, including:

- 0-360 kVAC, 3A
- 0-720 kVAC, 1.5A
- 350 kVAC, 1A
- 36kVAC 10A
- 200kVAC 0.5A
- 100kVAC 1A
- AC Current 20 kA
- DC Current 2 kA
- DC Voltage 700 kV
- Impulse < 800 kV
- Resistive loadbanks up to 240 V, 1600 A

These are either mobile or installed in dedicated HV test laboratories.

MOBILE TEST PLANT

We maintain a comprehensive mobile HV test capability (single phase) including the following sources mounted on dedicated heavy vehicles:

- 36 kV AC
- 200 kV AC
- 720 kV AC (resonant)

This capability is extended by a number of uncommitted HV sources that can be transported to site as required, ranging from 22kV AC – 100kV AC as well as 52kV AC p-p, 3ph switchboard test set.

TEST INSTRUMENTS

Our HV test equipment includes:

- Tettex manual and automatic DDF and capacitance bridges
- ICM – partial discharge detection instruments
- Megger and AEMC – insulation resistance meter
- CHK – micro-ohm meters
- DV Power – winding ratio meters
- Vanguard – winding resistance meters
- Omicron – frequency domain spectrometers
- Omicron – frequency response analysers
- Red Phase and Norma – earth resistance
- ELCID – core tester
- Ultrasonic partial discharge location equipment
- High resolution meters
- Narda – magnetic field strength to ICNIRP standards.
- Monroe – electric field meter
- Yokogawa – multichannel deep memory recorders
- Calibration references
- Wide range of laboratory instrumentation

TRANSFORMER MANAGEMENT

PRODUCT BROCHURE

Effective power transformer life management programs are essential for optimising power supply reliability and reducing the long-term cost of supply. Most industrial organisations depend on the reliability of their high voltage infrastructure to remain in business. Understanding the condition of power transformers is key to ensuring a reliable power supply.

We can develop or assist in the development of asset management systems to provide actionable information on how to optimise the performance and lifespan of these critical assets..

CONDITION MONITORING

A major proportion of power transformer failure mechanisms can be detected using simple low cost monitoring programs that utilise:

- Visual inspection
- Infra-red thermography
- Insulating oil analysis

CONDITION AND LIFE ASSESSMENT

Our experience is supported by extensive capabilities in testing and measurement including:

- High voltage testing
- Winding resistance, ratio and excitation current
- Insulation condition assessment including Insulation resistance, Polarisation index, Dielectric dissipation factor and partial discharge
- Ultrasonic discharge location
- Thermography
- Frequency response analysis
- Dielectric spectroscopy

HV laboratory services are augmented by comprehensive insulating oil testing including degree of polymerisation of paper, Furan analysis and the determination of sulphur and silver corrosivity. These services are an invaluable aid to transformer insulation risk management.

ROTATING PLANT LIFE MANAGEMENT

PRODUCT BROCHURE

Effective rotating plant life management programs are essential for optimising power supply reliability and reducing the long-term cost of supply. The operation of most industrial organisations today is highly dependent on a reliable rotating plant.

ASSET MANAGEMENT SYSTEMS DEVELOPMENT

Development of asset management systems help to provide actionable information on how to optimise the performance and life of these critical assets.

CONDITION MONITORING

A major proportion of stator and rotor failure mechanisms can be detected by condition monitoring programs that use:

- Visual inspection
- Partial discharge monitoring
- Stator current spectral analysis
- Infra-red thermography
- Vibration monitoring

The condition monitoring programs integrate these methods into a comprehensive condition assessment service.

CONDITION AND LIFE ASSESSMENT

Our experience is supported by extensive capabilities in testing and measurement, including:

- High voltage testing for a wide range of motors and generators
- Insulation condition assessment involving Insulation resistance and polarisation index, winding resistance and impedance, dielectric dissipation factor, partial discharge and recurrent surge oscillography (RSO)
- Electrical core imperfection testing (El CID)
- Ring flux testing
- TVA probe survey
- Motor Current Spectral Analysis
- Rotor shorted turns monitoring

PLANT REPAIR MANAGEMENT

PRODUCT BROCHURE

We assist plant owners in the repair of motors, generators and transformers. Repair management is a service designed to monitor the repair process to achieve the best possible outcomes. Our repair management service ensures a high quality of repair so the equipment can be returned to service in a reliable condition.

THE REPAIR MANAGEMENT PROCESS

- Development of a detailed repair/overhaul specification
- Detailed repair timeline (schedule)
- Quality assurance including Inspection test plan, in process testing and inspection, acceptance testing, witness hold point activities
- Progress reporting

The repair management program will ensure the repair is tracked from the time the machine leaves site for the repairer's workshop, until it returns to site.

The technical staff at Verico have over 30 years' experience in electrical plant condition and life assessment. This experience is supported by an extensive testing and measurement capability for low voltage and high voltage plant.

All components of the apparatus being repaired are included in the repair management process, this includes electrical, mechanical and ancillary components.

THE REPAIR TESTING PROCESS

- Electrical insulation condition assessment, before and during repair including IR and PI, winding resistance and impedance, dielectric dissipation factor and partial discharge.
- Core testing before and after burnout including ring flux – motors and generators, EL-CID – motors and generators and core losses.
- Transformers – FRA
- Acceptance high voltage testing
- Mechanical (assembly checks) including bearing clearances and dimensions, air gap clearances, rotor balancing and brushgear alignment
- Ancillary component functionality test

ELECTRICAL PLANT SUPPORT SERVICES

PRODUCT BROCHURE

Our electrical plant support services ensure the performance of your plant can be maintained and enhanced. These services are utilised by organisations throughout Australia and South-East Asia in a range of industries including electricity supply, mining, metal processing and manufacturing industries to optimise plant availability, reliability and to reduce plant operating costs.

ELECTRICAL PLANT SUPPORT PRODUCTS AND SERVICES

- Asset management program development
- Plant condition and asset management systems auditing
- High voltage testing in laboratory and field environments
- Condition monitoring
- Condition and life assessment
- Plant and systems investigations
- Earthing system measurements and investigations
- Failure investigations
- Owner's Engineer
- Compliance tests
- Power system harmonic and transient measurement and analysis
- Instrumentation and monitoring systems development
- Scientific and engineering measurements

Our expert testing and consulting staff are supported by advanced laboratories, equipment and measurement techniques to provide customers with solutions to their plant problems. We can also undertake advanced analysis and modelling to meet client needs.

TECHNIQUES

- Generation, transmission, distribution and industrial power systems
- Rotating plant (generators, synchronous condensers and motors)
- Power and instrument transformers
- Switchgear
- Reactive plant
- Batteries
- Overhead transmission lines and underground cables
- Earthing systems