

ENGINEERING, TESTING AND MONITORING SERVICES



AMPCONTROL ENGINEERING, TESTING AND MONITORING SERVICES

Since 1968, Ampcontrol has designed, manufactured and delivered integrated electrical solutions that improve safety, maintain efficient operations and meet stringent regulatory requirements.

Our technical expertise across a range of disciplines enables us to provide specialist advice and solutions to some of the most challenging operational problems.

The strength of our innovative solutions lies in our specialist engineers who are committed to discovering, developing and implementing market leading technology.

We partner with our customers, working through the design and application challenges unique to their operation. We focus our delivery across all aspects of our internal supply chain to ensure projects are installed and commissioned successfully.

From the technical design, analysis and assessment we can also carry out highly specialised monitoring and testing services to verify system performance and asset health. To do this, we deploy specialist mobile testing vehicles that utilise a range of specialised testing instrumentation.

Throughout the entire process, Ampcontrol is focussed on ensuring maximum performance for your critical assets. We achieve this by using scientific evidence, best practice and decades of industry experience to help our customer's make effective decisions.

Our ability to reach across the globe is made possible through Ampcontrol's extensive network of operations. This enables us to provide highly specialised technical support when and where you need us.

We specialise in providing services to power utilities, generation and distribution, resources, tunnelling and industrial markets.



Why work with us

- Proven, industry experienced technical leaders
- Focussed on delivering improved asset management outcomes for customers by adding best practice and scientific evidence to the decision making process
- Access to specialist testing and monitoring facilities including Insulating oil laboratory, process chemistry, mechanical testing and environmental monitoring to EPA standards
- We're a large diversified business with 50 years of continued operation who partners with you to design, build, commission and maintain our solutions



Electrical Engineering Services

We're known as electrical engineering leaders across the world. Our highly sought after experts come from a range of multi-disciplinary engineering fields and have pioneered technical advances and changes within the electrical industry.

In addition to developing our innovative products and systems our engineering experts can provide customers with a range of electrical engineering services that ensure your systems are designed and working to best practice specifications.

We back our engineering expertise with the latest in precision measurement, testing and analytical equipment and instrumentation.

Power System Design

Ampcontrol has extensive knowledge and experience in design and implementation of electrical reticulation systems from 415V to 132kV. Our services include:

- Specifications, tenders, installation supervision, commissioning, documentation, training and project management
- Power factor correction and harmonic analysis
- Transformers, HV/LV switchgear, monitoring, measurement and control systems
- Coal seam methane and bio-digestion cogeneration
- Process design and auditing services
- Energy efficiency and optimisation for the sites power system

Earthing System Design and Testing

- HV/LV detailed earthing grid design
- Using ENA EGO-1 Power System Earthing, AS2067 & IEEE 80
- Earth resistivity measurement with off-frequency injection test equipment
- Earth grid annual verification using high and low current injection testing
- Step, touch and transfer voltage measurements and modelling
- Hazard management
- System audits and verification to Australian standards
- Management plans for earthing grids
- RCD testing

In addition to carrying out system design, we can undertake comprehensive earth system tests which can include: step and touch

potential, earth and soil thermal resistance, soil moisture and where appropriate, earthgrid resistance with off-frequency current injection or 50 Hz current injection.

Auditing Services to Australian Standards

- Lightning protection audits and managements plans
- Electrical safety audits to AS3000/AS3007 utilising AS3017 and AS3019 testing procedures
- High voltage management plans
- Step, touch and transfer voltage measurements
- Hazard management
- Management plans to plant and equipment for mining and industry
- Electrical engineering management plan (EEMP) documentation
- SIL and HAZOP assessments

Power Modelling and Analysis

- Power system fault level studies
- Load and power flow studies
- Power factor correction studies
- Energy efficiency studies and implementation of power saving processes
- Harmonics analysis and mitigation studies
- Earthing system modelling and analysis
- Lightning protection and system design
- Motor starting studies

Arc Flash Analysis and Mitigation Studies

Ampcontrol has extensive knowledge and experience in detailed analysis of hazard levels associated with arc flash. Upon auditing your enclosure, Ampcontrol can provide recommendations for vent design and enclosure upgrades to ensure your arc venting methods are compliant.



Investigations

We're experienced in failure investigation on all types of HV assets and can assist clients with identifying the causes of their equipment failures. These investigations can include: fault recorder data reviews, third party reviews, scientific and engineering tests, equipment internal investigations and provision of supporting documentation.

Analysis services

Services are available to meet various analytical requirements including:

- Electronics and systems simulation
- Transfer function measurements
- Generator compliance testing analysis
- Power flow
- Protection coordination
- Control system analysis
- Transient performance
- Mathematical analysis

Electrical Rotating Plant Asset Management

We provide a full range of diagnostic testing, condition monitoring and asset management services to assist asset owners with daily and strategic requirements.

Some of the diagnostic tests we provide are: visual and endoscopic inspection, partial discharge testing including TVA and ultrasonic, rotor shortened turn test (RTO) and motor core testing (ring flux and EL-CID).

Thermal Imaging

Typical applications for our thermal imaging services include electrical joints and connection, electrical switchgear and switchboards, power and instrument transformers, generators and motors, electronic equipment and coal stacks.

Mechanical Testing

Minimise downtime, wear and tear and maintenance costs with proactive mechanical testing from Ampcontrol. We offer the following services:

- Power and industrial plant asset management:
 - Assessment and development
 - Reliability systems development
- Rotating plant condition monitoring:
 - Vibration analysis
 - Lube analysis
 - Wear debris analysis
 - System design and auditing
 - Oil sample point design and supply
 - Integrated reporting
 - Training and mentoring
- Machine laser alignment and balancing
- Machinery dynamics and modal testing
- Special measurement including strain gauge strain measurement
- Power and industrial plant performance:
 - Assessment and optimisation
 - Special measurements
 - Benchmark and acceptance test

Motor and Generator Tests

Our Electrical Test team can perform a range of tests including:

- HV AC applied
- Dielectric Dissipation Factor (DDF/ DLA / tan /doble)
- Impedance balance
- Winding resistance
- Insulation resistance and polarisation index
- Partial discharge measurement (on-line and offline)
- Peak pulse profile (TVA)
- Surge test
- Motor Current Spectral Analysis (MCSA)



Transformer Services

We're dedicated to supporting you with transformer engineering, testing and services across the full lifecycle of your transformer.

Transformer Testing

Our broad range of tests and analysis services include:

- HV applied and induced tests
- Dielectric Dissipation Factor
- Winding resistance and polarisation index
- Partial discharge measurements including drain valve probe and antenna
- Ultrasonic partial discharge location
- Recovery voltage, Frequency Domain
- Spectroscopy (FDS) on windings and bushings
- Frequency response analysis
- Thermography
- Tap-changer Vibration Monitoring
- WTI and OTI

Insulating Oil Analysis

A full range of insulating oil analysis services are available through our in-house oil laboratory, including:

- Dissolved gases
- Electrical stability
- Oxidation stability
- Moisture
- Density
- Viscosity
- Dielectric strength
- Precipitable sludge
- Furans
- Dielectric Dissipation Factor
- PCB
- Acidity
- Electrical resistivity
- Interfacial tension
- Dew point
- Degree of depolymerisation number
- Corrosive sulphur

High Voltage Testing

We are equipped with the specialist instrumentation and mobile plant to carry out comprehensive HV testing onsite.

Electrical Measurements

Our market leading HV testing capabilities include:

- Measurement intervals from nanoseconds to thousands of seconds
- Voltage, current, resistance, resistivity impedance, phase and frequency ratio
- Capacitance and inductance
- Power measurements, W, VAR, VA
- Power quality
- Transient voltage and current
- Transfer functions
- Timing
- Magnetic and electric fields
- Voltage and current transformer accuracy

Test Levels

We have extensive high voltage test capabilities aligned with the requirements of generation and transmission clients. These high capacity test sources enable testing up to the following test levels:

- 0-360 kVAC, 6.4 A,
- 0-720 kVAC, 3.4 A; resonant test set
- 350 kVAC – 0.5 A cont., 1 A 1 hr
- 36kVAC 10A
- 200kVAC 0.5A, or 100kVAC 1A
- AC Current 20 kA
- DC Current 2 kA
- DC Voltage 700 kV
- Impulse < 800 kV
- Resistive loads up to 250 V, 1400 A

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 HV sources able to be transported to site as required ranging from 22kV AC – 100kV AC.

Test Instruments

Our HV test equipment includes:

- Tettex manual and automatic DDF and capacitance bridges
- ICM – partial discharge detection instruments
- Omicron – frequency response analyser
- Megger and AEMC – insulation resistance meter
- AVO – winding ratio meters
- Vanguard – winding resistance meters
- Programma and Omicron – frequency domain spectrometers
- Norma and Yokogawa – earth resistance
- High Resolution Meters
- EMDEX – magnetic field strength meter
- Narda – magnetic field strength to ICNIRP recommendations
- Monroe – electric field strength meter

Specialist Monitoring Services

We have decades of experience working with clients to solve their operational problems, meet statutory obligations and ensure the safety and compliance of workplace environment.

Environmental Monitoring

Ampcontrol provides environmental monitoring services for a range of industry groups including power generation, port facilities, and heavy industries.

Our Newcastle laboratory is accredited by the National Australian Testing Association of Australia (NATA) for a comprehensive range of Ambient Air static and continuous monitoring methods, and climatic monitoring.

Our services include:

- Ambient air monitoring – on-site dust deposition, to comprehensive telemetry based continuous Air Monitoring networks including: SO₂, NO_x, CO, O₃ TSP, PM₁₀, PM_{2.5} and other specialised parameters.
- Meteorological stations, including wind speed and direction, ambient temperature, rainfall, solar radiation, barometric pressure and relative humidity.
- Air, water, soil and noise monitoring
- Water monitoring – ground, surface, river, and lake
- Soil sampling

Process Chemistry

Ampcontrol offers project services in concept design and operation of chemical process technology applied to cycle chemistry, water management plants and chemical cleaning of steam raising plant.

Our experienced specialists add value to your business through:

- Performance audits for large scale water management plants
- Chemical control audits
- Plant chemistry programme design, commissioning and management
- Condensate polishing plant performance
- Water processing plant performance modelling, optimisation and design
- Corrosion control

Occupational Hygiene

Occupational hygienists from Ampcontrol can assist you in providing a safe workplace environment and enable you to comply with OH&S legislative requirements and regulations.

Our services include:

- Risk assessment
- Occupational hygiene monitoring
- Airborne respirable dust
- Airborne inspirable dust
- Occupational noise
- Hazardous chemicals assessment
- Gas and vapour exposure
- Indoor air quality investigations
- Occupational vibration assessment
- Occupational lighting assessment
- Asbestos fibre monitoring (NATA certified)
- Building audits
- Synthetic mineral fibre monitoring
- Fume cupboard compliance audits
- Heat stress assessments
- Ventilation and fume collection audits
- Hygiene audits



Our electrical, HV, mechanical and environmental testing services are geared towards asset management support.

Conducted with the latest in precision measurement, testing, analytical equipment and instruments by leading multi-disciplinary engineers and scientists, our testing services provide best practice and scientific evidence to support your decision making.

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