



# ACRASTYLE LIMITED

## Excellence in Electrical Engineering



**Buildings & Infrastructure**



**Energy**



**Industrial**



**Transportation**



**Utilities**



## Who we are

Acrastyle Limited is an engineering company which designs, manufactures and functionally tests control and protection solutions at all voltage levels.

Since 1962, we have earned a unique reputation for superior product quality, excellence in electrical engineering and exceptional customer service. Our clients comprise end-users and contractors from within the Buildings & Infrastructure, Energy, Industrial, Transportation and Utility market sectors.

The partnership approach we take with all of our clients, aims to go beyond the simple delivery of high quality products and services: we adapt our services, solutions and resources to provide whatever level of support you need in order to complete your project on time, within budget and most importantly meeting your expectations.

This commitment to excellence has seen our business steadily grow and win multi-year framework contracts and significant major projects both in the UK and overseas.

## What we do

- Protection and Control
- Engineering Design Services
- Disconnectors and Earth Switches
- Enclosures & Kiosks
- Modular Buildings for Control & Protection Systems
- Neutral Earthing Resistors (NER's)
- Battery Charging Solutions
- Bespoke Design and Manufacture to suit individual requirements

## Quality assured

We are fully certified to ISO9001, 14001 and 18001 international quality standards, to all the key industry certification organisations, and with those customers who operate their own certification and audit systems.

## Why Acrastyle

As a fully independent engineering specialist, Acrastyle Limited can deliver systems, solutions and integrated products & services using equipment from all the major manufacturers. For further details about any of our products and services, including bespoke engineered solutions, please visit our website at

**[www.acrastyle.co.uk](http://www.acrastyle.co.uk)** or contact us directly.



## Buildings & Infrastructure

- Commercial
- Education
- Financial
- Healthcare
- Retail



## Energy

- Thermal
- Nuclear
- Wind
- Solar
- Hydro
- Wave & Tidal
- Biomass
- Energy Storage
- Energy from Waste



## Industrial

- Automotive
- Chemicals
- Oil & Gas
- Pharmaceuticals
- Mines & Metals
- Pulp & Paper
- Food & Beverage



## Transportation

- Rail
- Metro Systems
- Airports
- Marine Ports



## Utilities

- Electricity
- Gas
- Water
- Telecommunications



- Commercial
- Education
- Financial
- Healthcare
- Retail

## Buildings & Infrastructure

### General

Commercial buildings, universities, hospitals and large retail parks rely on energy to be stable and continuously available. It is a fact that nearly 40% of the world's energy is used in buildings and as much as 30% of energy used in buildings is wasted because of inefficient systems. Over a building's lifetime, 75% of its costs go to maintenance and operating expenses.

Acrastyle Limited has considerable experience in supplying products, solutions services to help meet the stringent requirements of the energy supply into the Buildings and Infrastructure market sector.

### G59 Interface Equipment

The scheme comprises a G59 compliant Mains Protection Relay which is an electronic monitoring device that looks at the quality and stability of the mains electricity. It is programmed to certain fixed parameters dictated by the DNO, these typically include voltage, frequency, ROCOF (rate of change), phase angle and so on. Should any of these areas go outside the programmed limits, then the relay will cause a protective device such as an MCCB or other type of circuit breaker to open, thereby instantly disconnecting the generator from the grid for protection and peace of mind.

### Automatic Voltage Control

Acrastyle has several standard designs for single and dual Automatic Voltage Controllers (AVCs), which incorporate the industry standard tap-change controllers.

Power transformers are sometimes fitted with adjustable output windings. This can be used to vary the output voltage to keep the supply at a constant voltage level, despite the input voltage varying considerably. The selection of the appropriate winding is performed by a

device which monitors the output voltage and the transformer winding currently in use. If a transformer winding change is required to return the output to the required level, this is done in the AVC scheme provided by Acrastyle.

Where transformers are connected in parallel, the control of these winding selection schemes is more complex and Acrastyle can provide several options for a standard 'dual AVC' scheme. Otherwise we can provide a customised design to meet the most demanding of needs.

## IDNO & DNO Solkor Schemes

A Solkor device is the trade name of a well-known pilot wire current differential relay made by Siemens.

Acrastyle integrates this device into a small self-contained wall box with all the associated scheme wiring, test facilities and backup protection commonly used in a standard scheme by some UK utilities.

These are also purchased by independent development contractors where an existing feeder with a Solkor pilot wire scheme applied is split in two and a new substation inserted in the middle of the feeder.

## Engineering Design

Acrastyle has significant experience in designing electrical schemes for LV and MV systems. Our wide experience and in-depth expertise in protection and control design enables us to design the most complex power system schemes as well as providing elegant, simpler schemes for less arduous applications.

## Education

Acrastyle Limited has provided solutions to projects such as:

- Liverpool University
- University of Strathclyde
- Bangor University

## Healthcare

We are proud to have been providers of product and services to the following:

- Christie Hospital
- Southern General Hospital
- Royal Liverpool Hospital

## Retail

Our involvement in providing equipment extends to major projects as:

- Prescott Business Park
- Chester Central Business Park
- North Manchester Business Park



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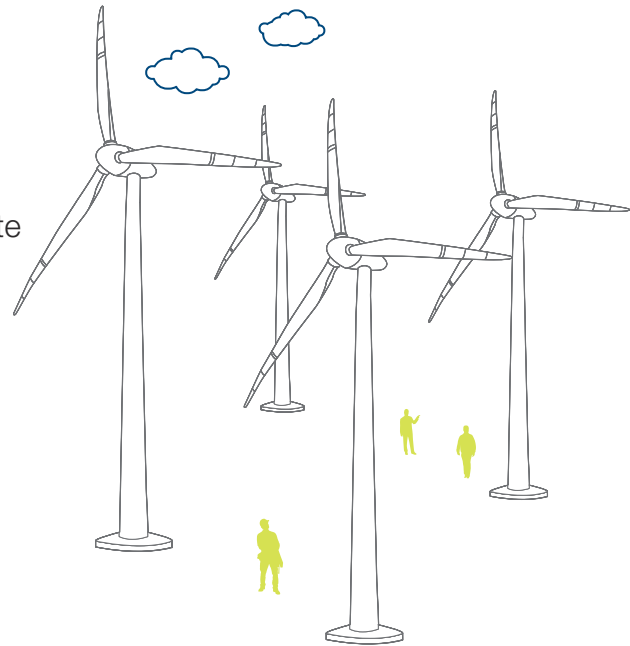
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- Thermal
- Nuclear
- Wind
- Solar
- Hydro
- Wave & Tidal
- Biomass
- Energy Storage
- Energy from Waste



# Energy

## General

Supplying energy involves three key elements:

- Generating electricity
- Transporting electricity
- Selling electricity

Energy companies can work in any of these different areas and some operate in all of them.

Most electricity is generated at large power stations connected to the national transmission network. However, electricity can also be generated in smaller scale power stations which are connected to the regional distribution networks.

The number and type of power stations built is the decision of each individual company based on market signals and government policy on issues such as the environment. There are many companies in the electricity generation sector, from large multinationals to small, family-owned businesses running a single site.

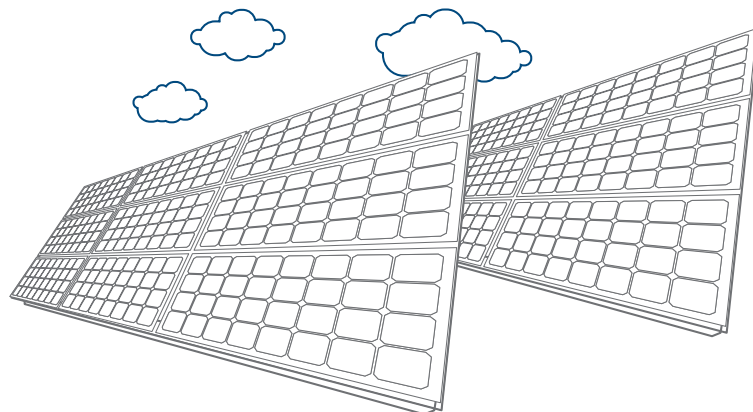
With its long experience of power system protection and control design, it is not surprising that many of the large generating stations and have been designed and built by Acrastyle and have all been individually designed and tailored to specific customers' requirements.

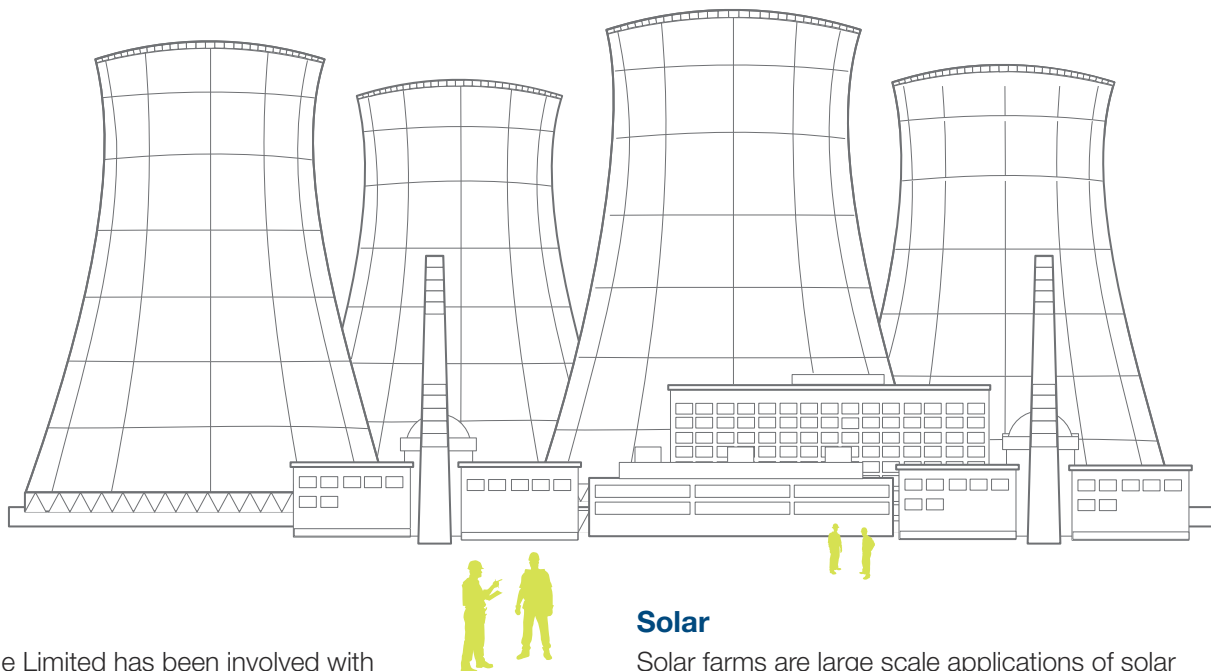
## Thermal

Some of the conventional thermal power plants Acrastyle Limited has been involved with are:

- Coolkeeragh Power Station in Northern Ireland
- Tanjung Jati "B" Coal Fired Power Station via Moritani Germany for PT Central Java Power Indonesia
- Little Barford Power Station via Mowlem Utility Services for RWE npower
- Blackpoint Power Station via Alstom Power Plants for China Light & Power
- Manjung Power Station via ABB Power Plants for TNB in Malaysia
- Tuas "A" Power Station via Toshiba Corporation for PUB Singapore
- Vasilikos Power Station via ALSTOM T&D for the Electricity Authority of Cyprus

We were responsible for the manufacture and supply of all the associated protection control cubicles for all elements of the power plants.





## Hydro

Acrastyle Limited has been involved with several hydro power plants including:

- Carsfad Hydro Power Station which forms part of the Galloway Hydro-Electric Scheme
- Quoich Hydro Power Station near Inverness in Scotland
- Fasnakyle Hydro Power Station near Inverness in Scotland
- Torr Achility Hydro Power Plant near Strathpeffer Scotland

## Nuclear

Our experience in supplying into the nuclear sector is also quite significant. Some of the nuclear power plants Acrastyle Limited has been involved with are:

- Sellafield Limited who manage nuclear fuel, materials and waste. Equipment installed includes protection & control systems and HV disconnectors.
- Hartlepool is a nuclear power station on the north-east coast of England. Acrastyle has supplied various products including Liquid Neutral Earthing Resistors.
- Heysham is a nuclear power station on the north-west coast of England near Lancaster. Acrastyle has supplied various products including Liquid Neutral Earthing Resistors

## Solar

Solar farms are large scale applications of solar photovoltaic (PV) systems, providing a source of safe, locally produced energy for many years after construction. Acrastyle Limited has been involved in many projects including:

- Lochcraigs solar farm located in Ayrshire
- Wide Lane solar farm
- Grendon solar farm near Atherstone in Warwickshire

## Wind

Acrastyle Limited has supplied and delivered protection and control solutions to some of the key onshore and offshore wind farms including:

- Ormonde offshore wind farm owned and operated by Vattenfall located off Cumbria
- Barrow offshore wind farm owned and operated by Ørsted located off Cumbria
- Robin Rigg offshore wind farm for E.on located in the Solway Firth
- Drumquin and Dromore main wind farm clusters for Northern Ireland Electricity
- Gort, Rasharkin and Tremorgue wind farm clusters for Northern Ireland Electricity
- Galawhistle and GlennAPP onshore wind farms for Scottish Power

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- Automotive
- Chemicals
- Oil & Gas
- Pharmaceuticals
- Mines & Metals
- Pulp & Paper
- Food & Beverage

## Industrial

### General

The performance of the assets across the range of industrial sectors means maximising uptime, reducing costs and extending useful life. Over time Acrastyle Limited has made investments in enhancing our skills and capabilities to ensure customers in the industrial market sector receive the best service possible.

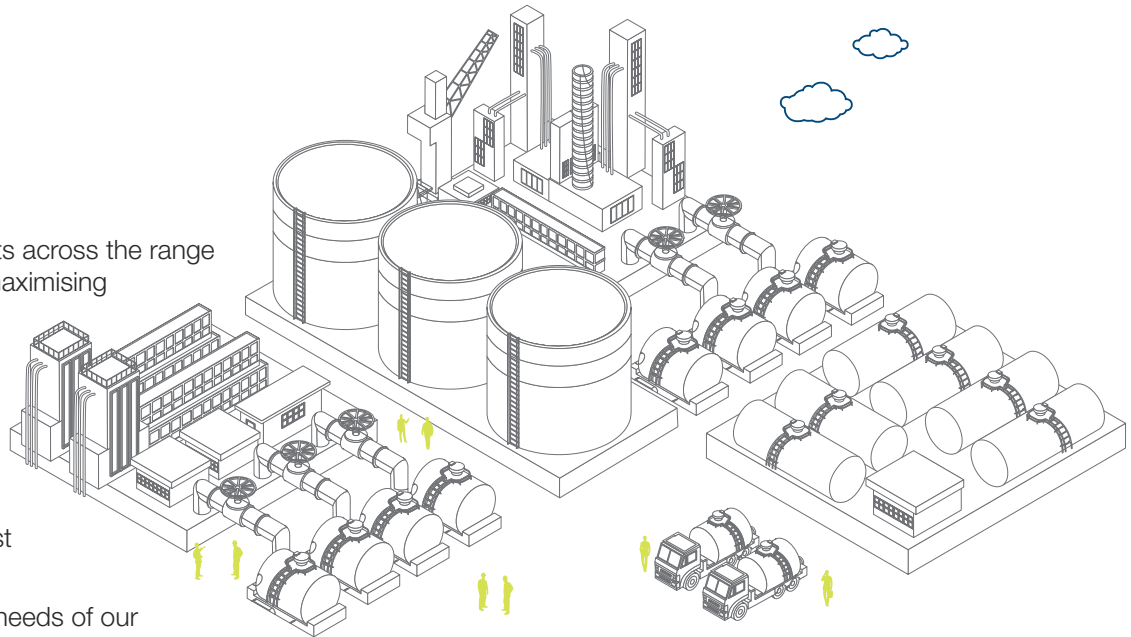
We adapt our offering to the needs of our clients, blending a range of capabilities with a strong underlying culture that brings dependable support. Our products, solutions and services cover a broad range of sectors including:

- Automotive
- Chemicals
- Oil & Gas
- Pharmaceuticals
- Mines & Metals
- Pulp & Paper
- Food & Beverage

We have been providing quality engineering and project management services for over 50 years.

### Power Quality

Modern industrial electrical networks require detailed information not only on the quantity of electrical power being supplied to consumers but also on the quality of that power.



Such parameters as the individual phase voltages and currents have long been monitored. However, modern demands have made it necessary to record such aspects as the reactive and real power flows, system harmonics and various sequence components.

Acrastyle has been providing Power Quality Meters and Systems using a wide variety of recording and analysis devices from all the leading manufacturers. These are either built into a complete system or as a stand-alone upgrade to an existing system.

### Mimic Control Panels

Acrastyle specialises in providing power system control panels (commonly called 'mimic control panels') and cubicles for all levels of electrical power system.

## Automotive

Many industrial sites require large scale power and we can reference the Ford Motor plant at Dagenham where our Liquid Neutral Earthing resistors have been installed. Acrastyle has also delivered protection and control solution and services to Toyota.

## Chemicals

We have been contracted to manufacture and supply Protection & Control equipment to Hays Chemicals who are part of the Branntag group.

## Food & Beverage

Acrastyle Limited has been involved with several projects in the food & beverage sector including:

- Mondelēz Banbury (Coffee)
- Mondelēz Bourneville (Chocolate)

We manufactured and supplied a mimic control board to each site to support their electricity distribution network.

## Mines & Metals

Tata Steel has installed a number of our Liquid Neutral Earthing Resistors at various voltage ratings throughout the UK including Port Talbot in South Wales.

## Oil & Gas

Wytch Farm is Europe's largest onshore oilfield, situated in one of the most environmentally sensitive areas of the UK. It is a conventional oilfield extracting oil (with some associated gas) from sandstone and limestone reservoirs. Perenco UK Limited took over the operation of the oilfield in 2011. Acrastyle Limited has supplied an electrical network mimic as part of their electrical distribution system.

## Pharmaceuticals

We have delivered equipment to AstraZeneca in the UK (a global pharmaceutical company). This included:

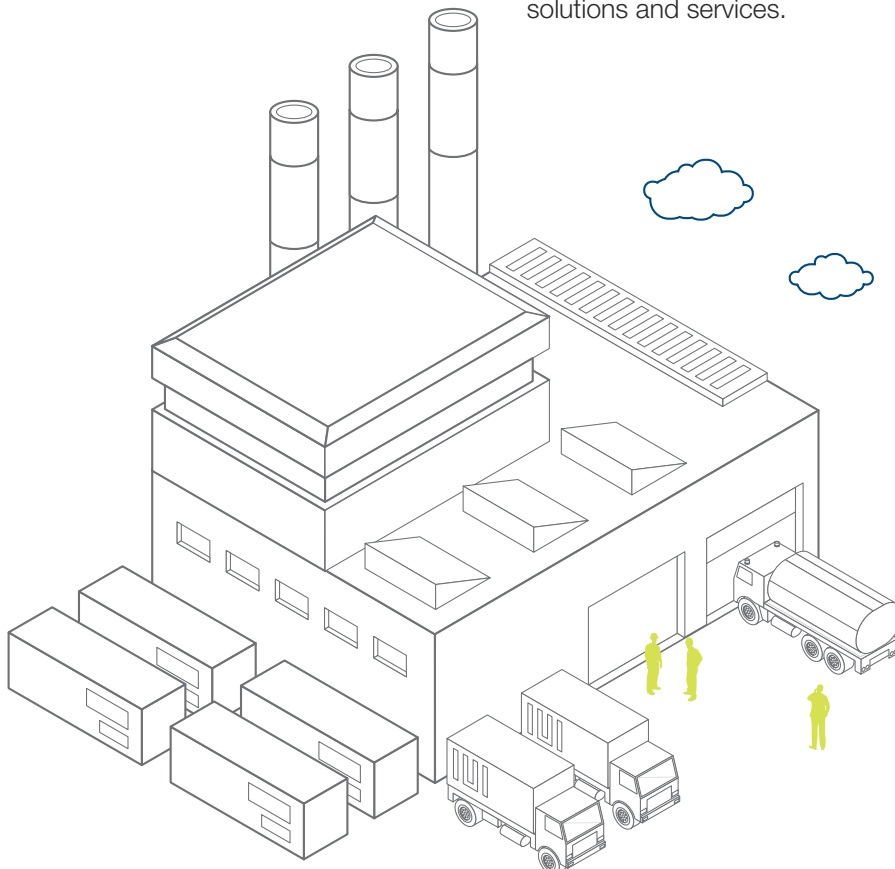
- Protection & Control cubicles
- Interface Engineering Services

## Pulp & Paper

Acrastyle Limited has worked with some of the key pulp and paper manufacturers, including:

- Shotton Paper in Deeside
- Bridgewater Paper in Ellesmere Port
- Aylesford News Print
- Carrington Paper Mill in Manchester

We manufactured a range of protection and control solutions and services.



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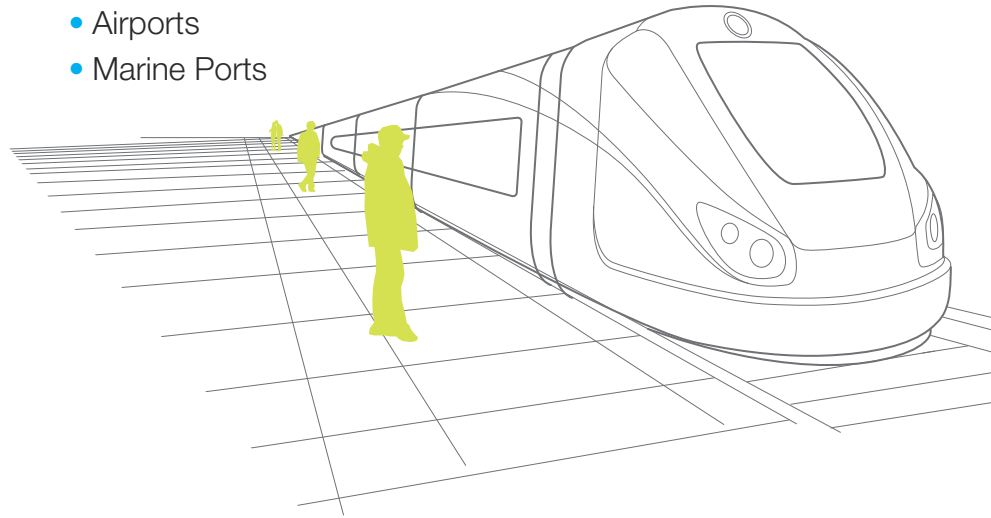
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- Rail
- Metro Systems
- Airports
- Marine Ports



## Transportation

### Rail

Trains need power; lots of it and the large amounts of electrical power that are required need to be safely harnessed and carefully controlled if reliability and operational safety are to be achieved.

Not only does the right amount of power need to be delivered to a load point that is constantly changing as the locomotive moves along the power-line, but the conditions seen by the power system due to that moving load are also constantly changing. Sometimes, if the load conditions are sufficiently high, then it's difficult to differentiate between a legitimate heavy load, a heavy goods train and a short circuit fault on the system. If it is a fault, it should be removed by the immediate shut down of the power system, if it is a legitimate load, it should remain connected.

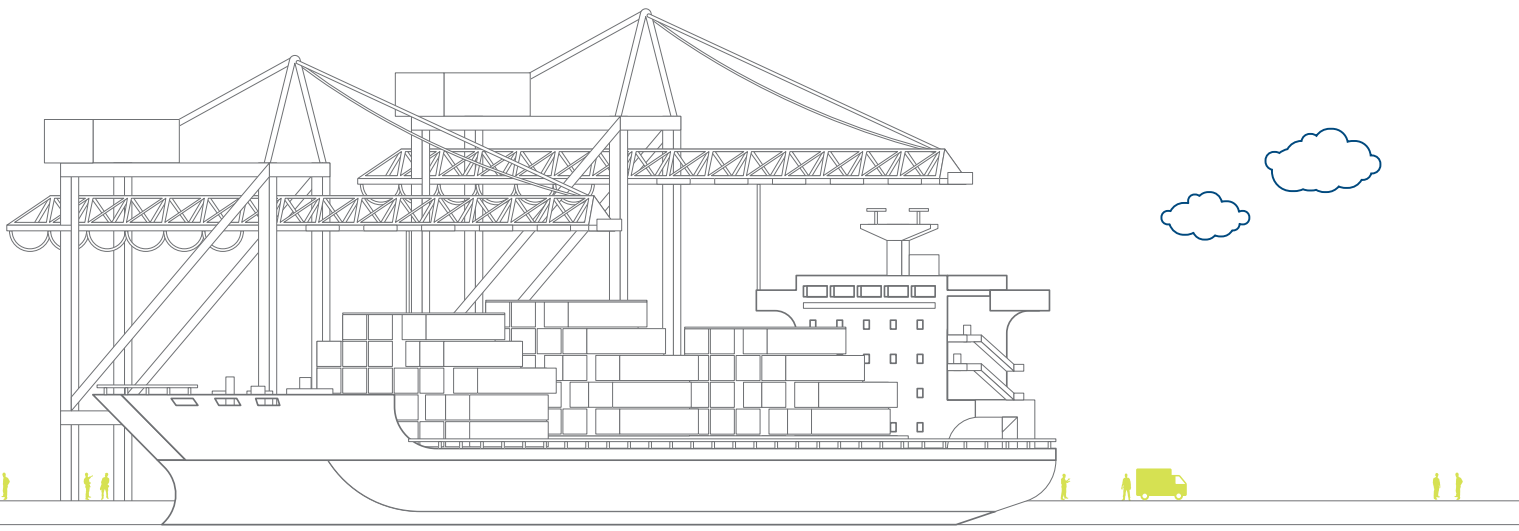
So, whether it is an AC or DC network, solving this challenge is the task of engineering companies like Acrastyle Limited and our mission is to provide solutions that ensure the power remains flowing.

Acrastyle has a long history of designing and building complex and highly technical multi-system solutions associated with the rail industry.

Trackside substations are examples of bespoke solutions we have delivered to the rail network. For Carillion Rail, we designed and manufactured three solutions for Primrose Hill; Mitre Ridge and Court Garden substations. Inside each carefully designed package, we supplied the protection and control panel, the RTU cabinet, the battery charger and batteries, the local control and annunciator panel, the marshalling boxes for all the incoming cable connections, as well as the usual lighting, heating and power sockets for ease of use by the operator.

Outdoor stainless-steel enclosures provide another example of where we can provide expertise. We designed and manufactured a range of enclosures for Mitsubishi Electric as part of their project with Network Rail at Imperial Park, Melksham, Ryhall and Didcot sites. The scope comprised stainless steel marshalling kiosks, CVT/MCB and HAM cabinets.





## Rail (continued)

Acrastyle Limited is also proud to have been involved in the Channel Tunnel Rail Link (CTRL) project which provides the high-speed rail link between the Channel Tunnel and central London, with three intermediate stations at Ashford, Ebbsfleet and Stratford.

Our involvement included:

- Protection Studies
- Protection & Control Cubicles
- Local Control Cubicles
- Substation Control System

We worked in conjunction with many of the major contractors associated with the rail industry including ABB, Balfour Beatty Rail and GE to name a few.

## Metro Systems

Energy continuity is critical. We can help you to succeed in your business by improving availability and life time of your electrical equipment while managing your budget. The process:

- Begins with a detailed understanding of the planned power system configuration
- Considers the power system operating parameters both normal and fault conditions
- Requires understanding of all the mechanical and electrical limitations that may be imposed on the site

We can replace old equipment with new equipment to extend electrical equipment's lifecycle, enhance availability and operational reliability. This includes the replacement of HV and LV protection relays, and other associated equipment.

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## Airports

We have had the opportunity to work on several significant projects within the UK's airport industry including:

- Edinburgh Airport
- Heathrow Airport
- Manchester Airport
- Liverpool Airport
- Stanstead Airport

Our scope included electrical infrastructure works to increase the electrical systems capabilities, range and resilience through designing and delivering protection cubicles, automatic voltage control panels and busbar cubicles and associated marshalling kiosks.

## Marine Ports

Installations providing onshore power to ships will have a significant impact on the local electricity supply and in many cases, the electrical distribution network around the port will need to be strengthened. Acrastyle Limited can offer a wide range of distribution solutions for a variety of applications and a large choice of bespoke products designed specifically for power supply in the and around the port.

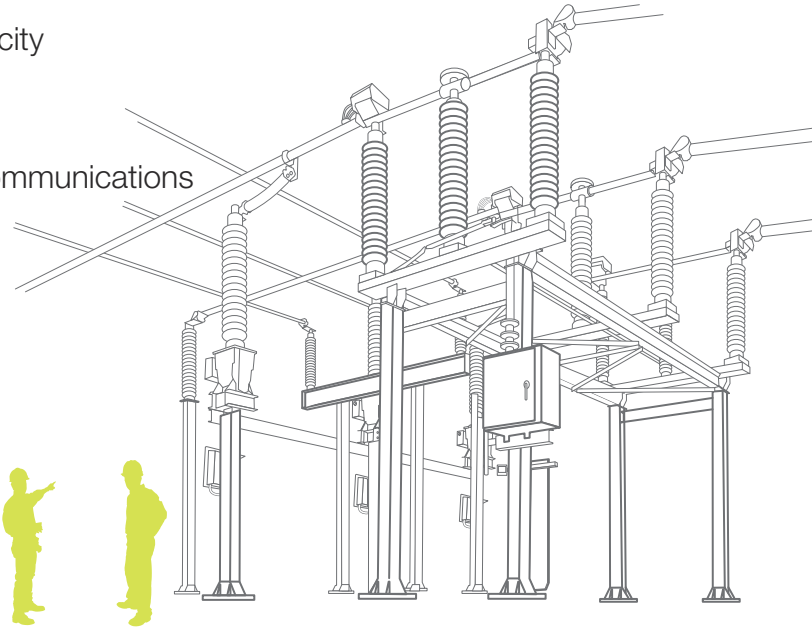
- MV electrical distribution units
- LV electrical distribution units
- Stainless Steel Outdoor enclosures and kiosks

We can also offer a comprehensive analysis of the system to examine the effects on the local distribution network before installing the shore connection solution.





- Electricity
- Gas
- Water
- Telecommunications



## Utilities

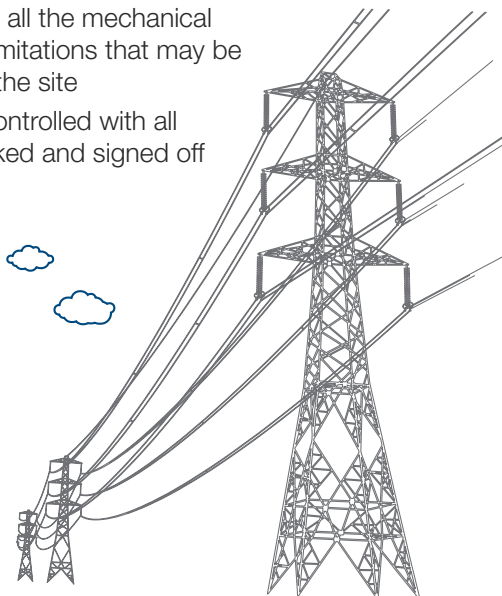
### Electricity

With its base in Ulverston, Cumbria, Acrastyle offers complete design, build and project management of electrical and mechanical protection systems, plus control systems and equipment for a wide range of applications and customers.

Acrastyle has significant experience in protection and control design with many thousands of LV, MV, HV and EHV protection and control systems in use throughout the world. Its wide experience and in-depth expertise in protection and control design enables it to engineer the most complex power system schemes as well as providing elegant, simpler schemes for less arduous applications.

The protection and control design process:

- Begins with a detailed understanding of the planned power system configuration
- Understands the power system operating parameters under both normal and fault conditions
- Understands all the mechanical & electrical limitations that may be imposed by the site
- Is carefully controlled with all stages checked and signed off



We have a comprehensive in-house engineering function with full drawing office support and includes the preparation of schematic diagrams according to specification and to international standards.

Acrastyle specialise in providing power system protection cubicles for all levels of electrical power. Our protection cubicles allow the customer to quickly and easily install new, or replace existing protection equipment with the following benefits:

- Plug-and-Play commissioning of the protection scheme, since it has been fully factory tested out to the terminal rails
- Minimum outage time and site-work cost
- No disturbance to adjacent cubicles other than the reconnection of bus-wiring between cubicles
- 'Red, green and black' drawings if required where the protection system is either retrofit or part of a phased new installation

Over the years, we have developed long standing relationships with many of the UK's TSOs and DSOs including:

- Electricity North West
- Northern Ireland Electricity
- Northern Powergrid
- Scottish Power
- Scottish & Southern Energy
- UK Power Networks
- Western Power Distribution

In addition, we have partnered multi-national organisations including ABB, GE and SIEMENS for projects both in the United Kingdom and overseas territories.

## Gas

Installations where gas is required to be pumped and stored may have a significant impact on the local electricity supply and in many cases, the electrical distribution network around the site will need to be strengthened. Acrastyle Limited can offer a wide range of distribution solutions for a variety of applications and a large choice of bespoke products designed specifically for power supply in the and around the site.

- MV electrical distribution units
- LV electrical distribution units
- Tariff Metering Cubicles
- Outdoor enclosures and kiosks

Previous projects include work at Petronas Kertih 33kV gas project in Malaysia, Haradh gas plant in Saudi Arabia and the Stublach gas storage project in Knutsford Cheshire UK.

## Telecommunications

Acrastyle delivers products and solutions that are designed to be flexible and tailored to meet customers' objectives and unique geographic requirements. These include:

- Telemetry Cabinets
- Tele-protection Signalling Cabinets
- Stainless Steel Kiosks and Enclosures

We have supplied telecommunications equipment to differing market segments, including utilities such as Electricity North West and infrastructure projects such as Heathrow airport.

## Water

Acrastyle can provide specific solutions to address challenges facing the water and wastewater industry including:

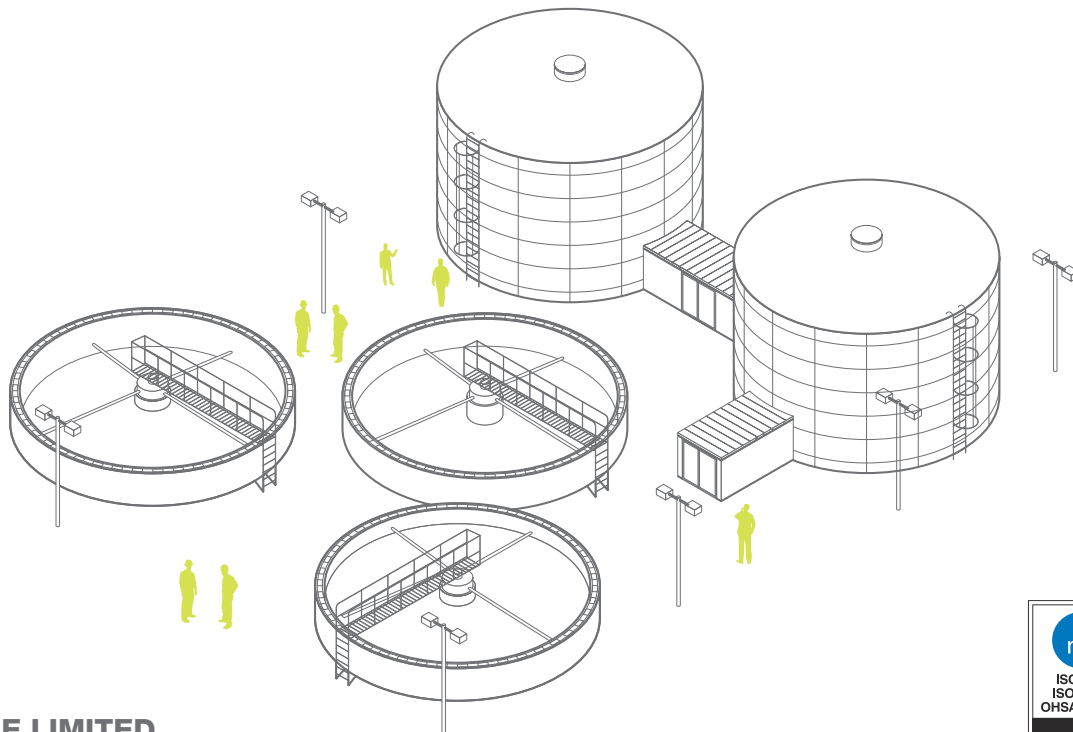
- Modernisation of aging Infrastructure
- Reduction of energy and operational costs
- Adapting technology to address operational changes

Over the years, we have worked with several water utility companies including United Utilities in supplying product and services; these include solutions to protect against mains voltage and frequency fluctuations which can help maintain the integrity and extend the lifetime of motors. Other equipment includes the provision of:

- Duty / Standby Pump Control Panels
- Emergency Trip Interface Panels
- Liquid Neutral Earthing Resistors
- Protection & Metering Panels
- Tariff and Sub Metering Enclosures

In the case of pump control panels, we have designed solutions that utilise variable speed drives, to manage and control a wide range of applications.

We have, as part of our engineering team, several dedicated Interface Engineers who interpret detailed design work and then translate that information to show how to connect primary plant to different parts of the system that forms a complete, interconnected and coordinated solution.



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