

# Hawkins

Leaders in forensic investigation



## RENEWABLE ENERGY

Providing forensic engineering, condition assessment, and expert witness services for the renewable energy sector.

[www.hawkins.biz](http://www.hawkins.biz)

On & Offshore Wind | Geothermal | Solar | Hydro Power | Subsea Cables



Established in 1980, Hawkins specialises in forensic investigation and root cause analysis for the insurance, legal and risk management professions, on behalf of both claimants and defendants, representing insurers, owners, operators and manufacturers.

Our clear, concise and timely reports will provide the understanding you need to make the correct decisions on your risks.

With a recognised and growing global presence, we have over 150 experts providing worldwide coverage from offices in Europe, MEA, and Asia, as well as key locations across the UK & Ireland.

Our experts can investigate, advise, and assist at any stage of an incident, including pre-loss prevention and risk assessment, root cause analysis, post-failure remediation advice and expert witness services.

Our extensive group of credible power experts specialise in each of the major components found on conventional and renewable power plants. Between them, they have hundreds of years' experience in design, manufacture, operation and maintenance, working for some of the world's largest manufacturers and operators of power plants.

We understand that any power generation outage is costly for all stakeholders involved, whether they are owners, operators or insurers. From the very beginning, decisions need to be made quickly and based on sound and clear advice.

Regardless of where in the world the incident took place, we can attend quickly after instruction, often the next day. A typical investigation might include taking witness statements, inspecting site equipment, considering any relevant documents, reviewing operational data, and examining exhibits in a laboratory, while updating clients with prompt reporting.

Hawkins understands the significance and complexity of operation and effective life management of critical power generation assets. We can help operators to optimise production performance while ensuring safety and compliance. Our services extend across life management, condition assessment and life extension of assets, and in the case of a forced outage, failure and root cause analysis.

*“Clients come back to Hawkins because of our honesty and integrity. Our subject matter experts have sound technical knowledge and expertise, married with a real commercial awareness of what our clients need. Hawkins provides a rapid response, giving timely, accurate advice and communication of the evidence in a way our clients can act upon.”*

Dr Andrew Prickett, Managing Director, Hawkins

## What we do



### FAILURE PREVENTION

Guidance on design, installation, and regulations to ensure safety, compliance, and risk reduction.



### ROOT CAUSE ANALYSIS

Scientific investigation into all aspects of an incident to determine what happened, why and in what sequence.



### EXPERT WITNESS SERVICES

Independent and impartial technical advice, including quantum & delay services to assist Counsel during all aspects of litigation.



### POST-FAILURE ADVICE

Consultancy advice to reduce, mitigate and prevent risks associated with similar events happening in the future.



### MAJOR & COMPLEX LOSS

Global resources and multidisciplinary teams, armed with the knowledge, equipment and facilities to manage and investigate major and complex incidents.

## ONSHORE AND OFFSHORE WIND

The increase in wind generation technology has been significant and rapid. The improved availability of advanced materials (e.g. glass and carbon-fibre composites) and manufacturing techniques has enabled the production of ever-larger and more efficient wind turbines. Although this has led to great strides in output, the reliability has lagged behind. The continuing demand for larger turbines, with very rigid, but lightweight blades has led to difficulties associated with blade manufacture, gearboxes, slew rings, generators, installation and tower construction. These problems have led to numerous structural failures, fires and mechanical breakdowns. As demand grows and wind farms become larger, their electrical systems become more complex and can cause very large losses (e.g. offshore wind farm electrical cables).

## GEOTHERMAL

Flash power plant units are based on nuclear reactors. The geothermal reactors work in aggressive steam conditions with carryover of silica and other rare earth elements. Mineral deposition and moisture damage can affect the turbine efficiency, leading to generation losses. In low temperature steam, the use of binary plants/heat exchange are employed. In binary plant, the area exposed to the aggressive steam is the heat exchange tubing and as such, cleaning and inspection is critical as scaling can occur.

## SOLAR

In the past decade the price of solar photovoltaic power has plummeted, making it a very attractive investment, leading to many projects being built in the UK and around the world. Common failures experienced are related to failure of inverter panels and other electrical failures.

Solar thermal has a far smaller installed capacity around the world, but we have supported clients with problems relating to the heat exchangers and problems associated with the frequent stop/start operation of the steam turbine and generators.

## HYDRO POWER

Hydro power is a dependable power generation method with plants typically having very long intervals between major inspections. Hydro plants are classed as conventional (head of water), pumped storage and, run of the river. The units can be small to very large and rotate at a variety of speeds based on the head and flow of the scheme. Issues can arise in the wicket gates (impact damage), penstock, and turbine (impulse or reaction). Impulse units are located where there is a large head of water, and reaction units used for low to medium heads.



## SUBSEA POWER CABLES

All offshore renewable power generation is dependent on subsea power cables, including offshore wind, wave, tidal and solar power. Subsea power cables include Interconnectors, for large-scale high voltage power transmission between national grids, Export Cables, for high voltage export from power generation system substations, and Inter-Array Cables, used in offshore wind farms (fixed-bottom and floating), for medium voltage connections between turbines and substations. Medium voltage cables are also used for smaller export requirements e.g. from wave energy devices.

Subsea power cables are multi-layered polymer/metal structures consisting of cylindrical layers and helically wound strips or wires. AC cable cores consist of three multi-layered cables wound together helically. Subsea power cables are very long, flexible and torsionally unstable, and require great care when handling and installing to maintain control and to avoid exceeding their mechanical limits. Some of the cable layers are delicate and are at risk of damage during transportation, installation and operation. The cables operate in harsh, dynamic environments, and cable systems need careful design and monitoring to mitigate the threats from wear and fatigue at exposed locations, usually near the cable ends.

Lifetime monitoring of cable condition, loads and displacements, and of the condition of any ancillaries, greatly reduces the risk of unexpected damage or failure.





# Hawkins' Expertise

With a recognised and growing global presence, we have over 150 experts providing worldwide coverage from offices in Europe, MEA, and Asia, as well as key locations across the UK & Ireland. Our expertise covers a vast number of specialist areas including:

## ACOUSTICS & AUDIOLOGY

Our experts assess and advise on acoustic design in the planning stages, and provide mitigation strategies post-construction in the event of a noise dispute.

## ARCHITECTURE

We investigate building defects to determine whether design or workmanship is the root cause. With experience in many sectors and across all RIBA stages from inception to occupation, we can provide advice tailored to your project.

## THE BUILT ENVIRONMENT

Our civil, structural, geotechnical and fire engineers provide expert investigation of defects and failures in the built environment, including water ingress, structural collapses, storm damage and personal injuries, especially on construction sites.

## CHEMISTRY & CHEMICAL ENGINEERING

Hawkins' team of highly qualified and experienced chemists and chemical engineers provide expert opinion on problems associated with chemical processes in a wide variety of industries, including: post incident investigation, goods handling, environmental concerns, hazardous substances and personal injury.

## CONTAMINATION

Our team of highly qualified and experienced chemists can investigate a wide range of contamination and spillage incidents.

## DIGITAL FORENSICS

Hawkins experts collect, authenticate and preserve original evidence. We discover the source of a digital event or attack, how it occurred, and what information may have been lost or compromised.

## ELECTRICAL

We investigate incidents including failures and injury involving most types of electrical equipment, from micro-electronics and domestic electrical appliances through to high voltage generation and distribution.

## ESCAPE OF WATER, GAS, OIL AND OTHER FLUIDS

We can provide system failure analyses for incidents involving all fluids and gases in industrial and domestic settings with onsite and laboratory investigations.

## FIRE & EXPLOSIONS

As a leader in forensic fire investigation, Hawkins has the necessary knowledge and experience to investigate the full scale of losses globally, and advise on recovery, liability and risk management.

## FIRE ENGINEERING

Hawkins has the necessary competencies to advise on fire engineering matters including compliance with fire safety legislation and guidance, investigation of fire spread and building fire safety design, construction and management.

## FRAUD

We compare physical evidence with witness accounts to establish if the evidence is commensurate with a suggested sequence of events or actions. This applies to both small and major losses.

## HYDROLOGY

Our expert hydrologists and engineers have years of experience identifying the cause(s) of complex flooding incidents.

## MARINE INCIDENTS

We assist on a wide range of incidents including agricultural cargoes, liquefaction, fires, explosions and chemical contamination.

## MATERIALS

From medical implants to satellites, our experts are on hand to establish the cause of failure of manufactured items.

## MECHANICAL

Losses often involve the failure of multi-component mechanical systems. We have the knowledge and experience to identify the cause, no matter how complex.

## PERSONAL INJURY

We provide independent and expert assistance with all types of personal injury, including specialised and complex areas like slips, trips and falls, and noise-induced hearing loss.

## PLANT PATHOLOGY

At Hawkins, plant pathology encompasses agricultural, horticultural, forestry, marine and contamination claims. Our experts are experienced in investigating the causes of plant diseases, crop failures and spoilage of fresh produce and agricultural cargoes.

## POWER & ENERGY

We investigate all aspects of failures in traditional thermal power, oil and gas, and renewable energy sources. As well as incidents such as electric shock, gas leaks, power failure, over-voltage, equipment failure and poor design and maintenance.

## PROCESSES

Our engineers help identify the cause of a problem and advise on liability and future prevention.

## PRODUCT LIABILITY

We are experts in the field of product liability and often deal directly with UK Trading Standards offices or similar statutory bodies.

## QUANTITY SURVEYING

We provide cost consultancy, dispute resolution, and quantum & delay expert witness services through our two specialist subsidiaries. Services include insurance reinstatement valuations, pricing proposed works assessing the quantum of claims, and the impact of delays.

## RAILWAYS

We have investigated incidents including derailments, unintended runaways and accidents at level crossings.

## ROAD TRAFFIC COLLISIONS

Our investigators identify all contributory factors and analyse issues such as vehicle speed, visibility, human factors, CCTV, road positioning, weather, vehicular faults and damage assessments.

## VEHICLE, PLANT & MACHINERY

We investigate fires and failures involving all types of vehicles and plant. We routinely review designs and maintenance practices to provide recommendations to our clients.



## QUANTITY SURVEYING SERVICES

We provide market leading Quantum & Delay expert witness services through our specialist subsidiaries A Lamb Associates (ALA) and Morham and Brothie Partnership (M+BP).

### ALA

Our team is comprised of highly qualified industry leading experts. ALA has considerable experience across all major building and engineering sectors, with particular expertise in cross country pipelines, energy and major infrastructure projects.

Blue chip multinationals, Tier 1 contractors and specialists all turn to ALA for reliable authoritative and accurate expert opinion.

### M + BP

M+BP are an established Chartered Professional Quantity Surveying practice, whose clients include individuals, corporate bodies, insurance companies, and trusts. M+BP provide QS services for all sectors with specialism in listed historic building projects and one-off complex builds. M+BP prepare bespoke cost plans to suit clients, funders, and insurance bodies, to provide the best service and most accuracy.

Our team of specialist experts provide Expert Quantum and Expert Forensic Delay Analysis and have a wide range of experience, including:

- One-off complex projects for high-net-worth individuals
- Residential builds (new/alterd/extended)
- Visitor centres and museums
- Whisky distilleries
- Hospitality, including restaurants, theatres and cinemas
- Commercial fit out
- Education, government, and local authority

## SERVICES

Our team of expert in-house Quantity Surveyors provide a range of services including:

### INSURANCE REINSTATEMENT VALUATIONS

Our experienced team provides reinstatement valuations, with expertise in historic or listed properties. These often feature unusual or difficult to price items, such as masonry vaults, elaborate fireplaces, and traditional building methods. Using generic rates to calculate these valuations is seldom best practice, which is why M+BP advocate providing detailed costings when undertaking these exercises

### PRICING PROPOSED WORKS

Our experts provide support pricing proposed works. This includes pricing proposed remediation options so that an informed decision can be made on the most cost-effective solution.

### ASSESSING THE QUANTUM OF CLAIMS

We investigate and assess the reasonableness of claims received. Our experienced team will review all costs to determine if costs have been reasonably and properly incurred. We assess whether a reasonable procurement process has been followed, whether rates represent market value and whether work pricing reflects the scope. We are able to make adjustments for betterment, inflation or other relevant matters.

### THE IMPACT OF DELAYS

The duration of a project can have a significant impact on the amounts claimed. Our experienced team of Forensic Planners can assess the cause of any delays to progress, determining whether all costs claimed are properly due.

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