

# Hawkins

Leaders in forensic investigation



## POWER & ENERGY

Combining forensic engineering expertise, with real world experience of power station operation, to investigate losses in power generation equipment.

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

Anaerobic Digestion | Batteries | Component Failures | Conversion Equipment  
Electrical Protection Systems | Electricity Transmission Explosions | Fires  
Gas Turbines | Generators | High Temperature Degradation | Hydro Power  
Materials Testing | Mechanical Failure | Metallurgy | Microgrids  
Offshore Oil & Gas | Oil & Gas Pipelines | Power Plant Damage  
Nuclear Generation | Solar PV | Solar Thermal | Switchgear | Steam Turbines  
Thermal Generation | Transformers | Wind Turbines

# ABOUT HAWKINS

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Hawkins, established in 1980, provides specialist forensic root cause analysis and expert witness services to insurance, risk management and legal professions, on behalf of both claimants and defendants. Hawkins has represented insurers, owners, operators and Original Equipment Manufacturers from around the world.

The company has 8 offices in the United Kingdom as well as offices in Dubai, Hong Kong and Singapore. All offices are staffed by highly experienced forensic scientists and engineers from a wide range of disciplines, including mechanical engineering, electrical engineering, and physics, metallurgy, and fire/explosion investigation.

We are able to offer a highly experienced team of scientists and engineers with extensive expertise, who provide specialist forensic investigation services worldwide.

Failures in power generation equipment can lead to large losses, both in terms of reinstatement and business interruption. The root cause of such failures can be complex, and early intervention by an expert can help minimise damage, reduce costs and identify measures that can help prevent an incident from reoccurring. We can form a multi-disciplinary team should an investigation require it, and we understand the problems that may arise in power and energy related fields.

As well as being experienced in the power generation industry, we also have expertise in investigating incidents in the upstream and downstream energy production industries.

Hawkins excels in providing high quality reports to assist our clients in understanding the technical issues of a case, enabling them to assess liability. Our reporting is flexible, ranging from an initial consultation, to letters providing a brief overview, to full analysis and CPR Part 35 compliant Court Reports, in order to best suit our clients' needs.

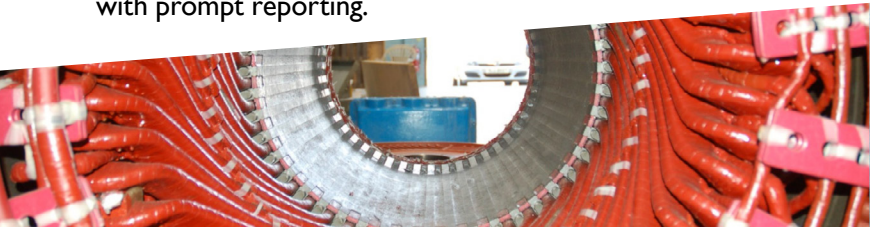


## WHY APPOINT A FORENSIC INVESTIGATOR?

The Power Generation sector is a challenging industry to work in. Though safety is a major consideration, there are times when things do not go to plan. Hawkins can help discover what went wrong by establishing the facts clearly and precisely, so you can make informed decisions on both the best way to recover from an incident, and how to stop it from happening again.

Within the Hawkins Power team we have a mix of engineers with: operational backgrounds within the electrical supply industry; design knowledge with leading original equipment manufacturers; and laboratory experience in analysing failed components. This affords us the depth of subject knowledge to perform detailed forensic root cause analysis, but also the breadth to provide more holistic services.

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.



## RISK ENGINEERING SERVICES

Our investigators are experienced at working with risk managers, the insurance industry, and legal professionals in order to progress claims as quickly as possible. We understand the commercial pressure to get up and running again quickly.

We are able to carry out full plant risk assessments, covering the physical technical risks of the installed equipment, split into its various subsystems. We can also review the quality of the processes and procedures that help to ensure the reliable safe operation of power plants. Such assessments can be tailored depending on requirements, some examples may include:

- Due Diligence
- Project Refinancing
- Plant Status Review
- Process Safety Review
- Engineering Risk Assessment

We have carried out such assessments on a variety of conventional and renewable projects across the world.



# OUR EXPERTS

## BIRMINGHAM



Simon Batt  
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Simon has 20 years' experience as a mechanical engineer. He has worked for both Rolls-Royce and Siemens Energy, where he gained experience of: gas turbine engine development, testing, failure investigation, and contract acceptance. Simon held the position of Chief Performance Engineer based on his expert knowledge of gas turbine performance and thermodynamics. He also played a leading role in developing the strategy for decarbonisation of gas turbines and filed a patent relating to running gas turbine engines on hydrogen.



Gary Hotchkiss  
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Gary brought his considerable experience in electrical engineering and problem solving skills to Hawkins in 1999. Gary specialises in the investigation of failures of electrical equipment, including power convertors, transformers, switchgear and electrical machines. In addition, he investigates incidents involving arc flash and electric shock. Gary has also carried out numerous investigations into the causes of fires and explosions.



Lin Sun  
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After his PhD, Lin joined the Advanced Forming Research Centre as a Project Lead of the Materials Characterisation team. Lin has worked on the design, development and characterisation of novel alloys for mechanical transmission systems in gas turbine jet engines at the University of Cambridge, as well as held the role of Lead Engineer at GE Power. In 2017, Lin joined Hawkins, and now specialises in metallurgical, materials, steam turbines and mechanical failure analysis.



Neville Tranter  
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Neville's background is in metallurgy. He ran a metallurgical laboratory sub-contracted to Rolls Royce for 7 years, where he gained extensive experience in the failure and operation of turbine engines. Through third-party work, Neville also investigated failures of items, such as switch gear, transformers, heat exchangers and other ancillary component failures. With Hawkins, he has investigated a range of incidents in the power industry, such as anaerobic digestion plants and reciprocating engines.





## BRISTOL



Andy Bryce

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Andy has a background in materials failure analysis, beginning at the Royal Aircraft Establishment. After completing a Masters in Aerospace Materials Engineering, he specialised in failure analysis of in-service and experimental gas turbines at Rolls Royce. He also worked on the development of quality standards for single crystal gas turbine blades. With nearly 30 years at Hawkins, Andy has inspected a broad variety of gas turbines and other power generation machinery. He has given evidence as an expert witness in court on numerous occasions.



Gerald Deshais

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Gerald has worked for over 20 years in the aerospace industry, where he gained considerable experience on materials, mechanical, and electrical systems. After his PhD on stress corrosion cracking, Gerald joined Rolls-Royce and led projects ranging from advanced fatigue modelling to the design of novel aero-engine transmissions. He then held senior engineering roles at GE Aviation involving the design of composite structures and of aircraft electrical systems. Gerald is versatile and able to address concerns across multiple disciplines.



Giuseppe Scatigno

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Giuseppe has a background in metallurgy and materials, applied to the study of corrosion and electrochemistry. After his PhD, Giuseppe worked in the power industry for EDF, on the management and life extension of numerous assets, such as cooling systems, turbines, and generators. Giuseppe led corrosion monitoring for the management of both existing and under-construction units. Giuseppe conducted failure root cause analysis, through inspections, data review and trend analysis, to improve material selection and overall component performances.



## CAMBRIDGE



Nick Ashby  
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Nick has a background working with power generation companies in both the UK and Hungary. He has been authorised under the National Grid Safety Rules and has been both Operations Manager and Maintenance Manager at Seabank Power. Nick joined Hawkins in 2013 and investigates failures regarding conventional, thermal and nuclear generation as well as electricity transmission. In addition to operations and maintenance experience Nick has significant experience in the development, construction and commissioning of new build power plants.

## LEEDS



Ben Lister  
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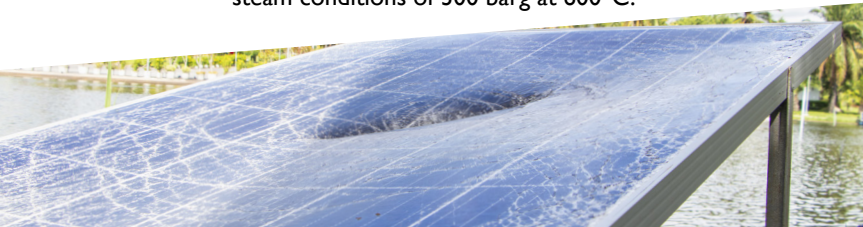
In 2008, Ben graduated from the University of Cambridge where he read for the Engineering Tripos and specialised in Electrical & Electronic Engineering. After graduation, Ben joined the engineering and research section of E.ON as a specialist in system modelling and analysis, focusing on renewable electrical generation technologies. Ben later took on a project support role as a microgrid and battery specialist on a number of project designs both in the UK and overseas. He joined Hawkins in 2019.

## GLASGOW



Paul Moody  
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Paul has a background in materials testing and evaluation, as well as in inspections for power generation sites and boiler materials development. Prior to joining Hawkins, Paul worked for Doosan Babcock for approximately 15 years. Initially, he conducted site inspections at power generation and petrochemical sites, and moved on to evaluate and develop materials for high temperature, high pressure parts for so-called supercritical boilers, with nominal steam conditions of 300 barg at 600°C.



## LONDON



**Ben Adams**  
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Ben's background is in the operation and maintenance of power plants. Prior to joining Hawkins in 2018, he was responsible for providing electrical engineering expertise to a large international fleet of conventional and renewable generation technologies. A specialist in large generators, Ben has carried out root cause analysis on numerous generator, transformer, switchgear, motor and control system failures. He regularly presents at conferences and sits on international committees in the generator field.



**Nick Wright**  
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Nick has a PhD in Materials Science from the University of Birmingham. After graduation, he joined Cosworth Ltd as a Materials Engineer, developing materials and processing technologies for Formula 1 Engine applications. Nick then worked at ERA Technology Ltd as Head of Forensic Engineering, investigating failures in power generation, petrochemical process and electrical distribution hardware. He joined Hawkins in 2013.

## SINGAPORE

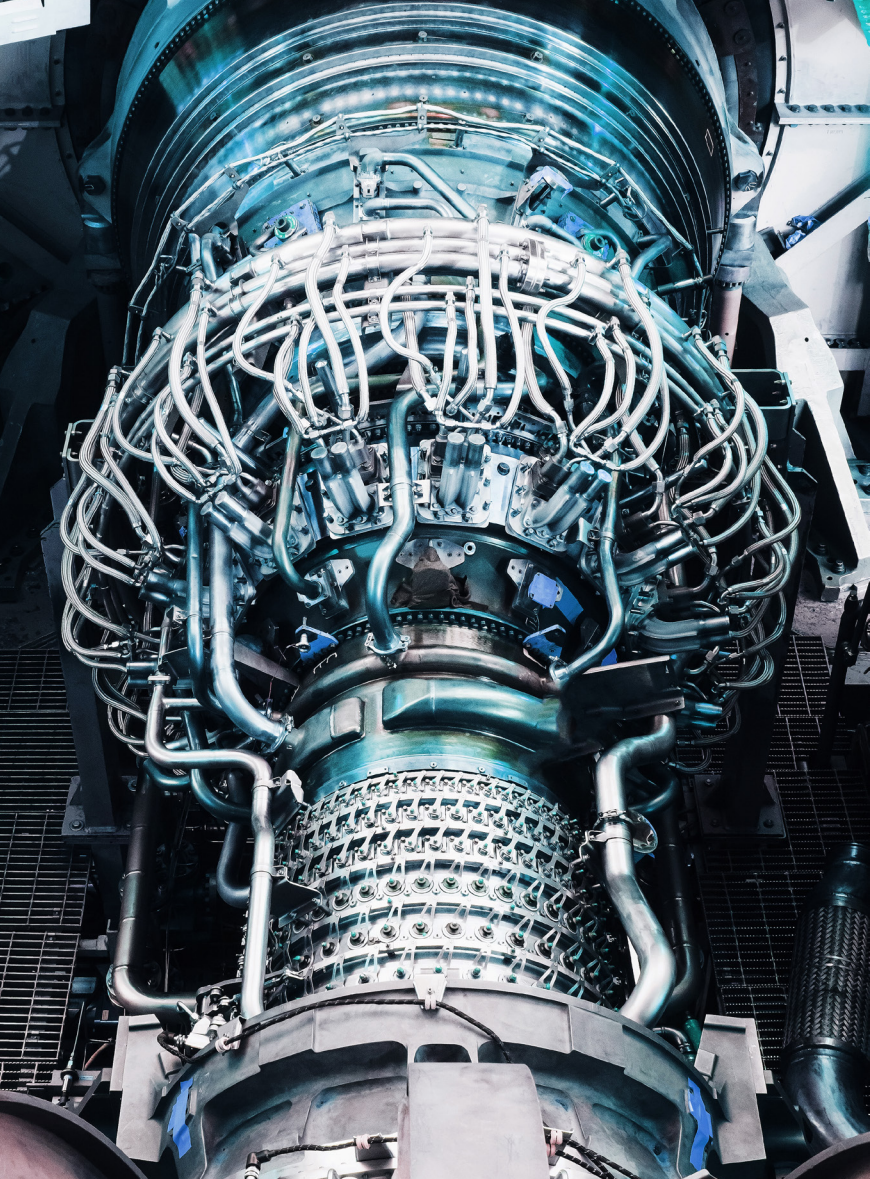


**Graham Cooper**  
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Graham has been a Chartered Engineer since 1991 and is also a Professional Member of the Institute of Materials, Minerals & Mining. He worked for British Airways in 1995 as their company metallurgist and defect investigation specialist before joining Burgoynes in 1998. Graham joined Hawkins in 2014 and has investigated over 500 mechanical and materials related cases including aircraft accidents and incidents, oil and gas production and pipeline incidents, industrial process plant incidents and power generation turbine failures.







## GAS TURBINE ENGINES

Gas turbine engines remain a product of choice for many operators worldwide in the power and energy industry. The operational flexibility, efficiency and reliability make them ideally suited for use both offshore and on land.

However, this sophisticated equipment can, and does, occasionally fail, potentially resulting in financial losses of tens or even hundreds of millions of pounds. Failures can range from simple mechanical issues with valves or ducts to more complex issues, such as: blade failure, bearing failure, or an instability with airflow and combustion. Failure to meet contractual requirements in terms of performance, emissions or maintenance schedules are also common complaints from operators.

Gas turbines will continue to “keep the lights on” for many years to come, as they respond quickly to changes in the grid power demand, and will complement the deployment of renewable energy. However, this demand may lead to a more cyclic nature of operation. Along with the incorporation of new technology for decarbonising, such as alternative fuels (e.g. hydrogen, ammonia or biofuels), the risk of failure and financial loss is potentially increased.

Hawkins investigators have a range of expertise that can help to understand both failures and operational issues, whether this be related to losses, claims, or contractual requirements. We provide proactive advice and guidance to plan, understand and mitigate risks with changing technology.



# BOILERS & STEAM GENERATORS

Boilers/steam generators for power generation are complex items of plant and there are many ways in which they ultimately break, resulting in loss of power generation, with associated claims of damage. Power plant operators, engineers, investigators and insurers are reliant on good record keeping of boiler parameter data, recorded by the Distributed Control System (DCS), and on reports of periodic inspections carried out on the boiler and connecting pipework to the turbine

For example, changes in boiler water chemistry highlighted by the DCS could indicate seawater ingress in a condenser, or internal corrosion in boiler tubes. Flue gas pressure fluctuations could indicate balance of plant problems in drawing flue gas through the boiler. Boiler inspections could reveal tube metal loss via fireside corrosion, or localised overheating.

Hawkins investigators have extensive experience in reviewing all the relevant information and analysing the failed components, to both establish how the failures occurred, as well as assist the operators with understanding the problems and support insurers with any claims.





## NETWORKS & CONNECTIONS

The electrical network, both inside and outside a power station, and the switchgear and protection equipment used to operate and connect to these networks, are vital to the performance of the plant. Understanding how these networks are designed and validating this design can identify potential problems before they occur, thus avoiding system outages, downtime and unnecessary loss of generation.

A properly configured protection network will act under all configurations and operating conditions. It will be able to identify faults and isolate the minimum amount of equipment to remove fault conditions, without mistakenly operating when there is no true fault or disconnecting too much of the site. This also improves response to faults by providing a good indication of the location, type and potential source of electrical faults within the network allowing targeting of restoration efforts.

Hawkins can also help assess the risk of operating switching devices in the network in order to advise on the most appropriate Personal Protective Equipment (PPE) to employees performing switching activities. Appropriate PPE is an essential component of the safety system on any site, but without calculation and assessment the risk posed to employees in switch rooms cannot be known.

# OUR OFFICES

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