

# Burgoynes

consulting scientists and engineers

THE EXPERTS IN FORENSIC INVESTIGATION



[www.burgoynes.com](http://www.burgoynes.com)

## Burgoynes

Established nearly 50 years ago, Burgoynes is a globally renowned Partnership of forensic scientists and engineers specialising in the investigation of fires, explosions, engineering failures, marine disasters, other associated incidents and personal injuries.

Being the largest organisation of its type in the UK, we provide comprehensive coverage throughout the UK, with a worldwide presence enhanced by our group offices in Dubai, Hong Kong and Singapore.

We have extensive experience of investigating incidents on land, at sea and those involving the aviation industry. Our land-based investigations include incidents involving residential and commercial properties, road and rail vehicles, plant and machinery, and large process/production sites. In more recent years we have built on our reputation to expand into, and become established in, other specialist areas of investigation, including materials, mechanical, electrical, chemical and structural engineering, escapes of fluids, including water and oil, and contamination assessment.

We have been involved in the investigation of many of the most significant incidents that have occurred around the world, including many of landmark cases in the insurance industry. Our clients include major insurers and loss adjusting companies, re-insurers, marine P&I clubs, hull insurers, salvors, ship owners, major petrochemical companies, semi-conductor companies, aircraft operators and manufacturers, shipyards, government agencies and private individuals. All information provided by clients is treated in the strictest of confidence.

We believe that a thorough investigation of an incident should include consideration of all the relevant background circumstances as well as the physical evidence. We maintain a specialised Library in-house run by qualified Librarians. The breadth and depth of our experience of investigations mean that we are able to advise on the technical aspects to allow others to assess liability, repudiation and recovery action against a Third Party. Our experience as expert witnesses is worldwide.

We have the expertise and resources to assemble a multi-disciplinary team of investigators whenever necessary. In instructing Burgoynes you are engaging a wealth of experience and expertise that cannot be matched. We pride ourselves on delivering excellent service and consistently exceed our clients' already high expectations.





## Fire & Explosions

Fire and explosion investigation and the assessment of issues arising in consequence represent much of our business. Our work takes us into practically every conceivable environment both on land and in the marine, offshore and aviation.

The investigations we handle range from small incidents involving domestic appliances to major catastrophes at complex industrial, petrochemical and COMAH installations.

Our fire and explosion investigators come to us from a wide variety of backgrounds and experience. They are selected for their academic achievements and their ability to investigate. Our rigorous training and technical support are unrivalled, thereby producing the best independent investigators and making us the experts of choice in the insurance market.

Recent high profile land-based cases include Tata Steel Factory (Netherlands 2010), Hyatt Regency Churchill Hotel (2014), Clandon Park House (2015), Glasgow School of Arts (2015) and Battersea Arts Centre (2015).

## Marine

Burgoynes is renowned and widely respected for our expertise in the investigation of marine incidents. We have a large number of highly experienced marine investigators in the UK and in our overseas offices, in Dubai, Singapore and Hong Kong. Our overseas locations were chosen because they were and remain important strategic hubs for the marine industry. Our geographical presence allows us to respond quickly to casualties all over the world.

Our personnel have amassed considerable experience in the investigation of marine fires and explosions on all types of vessels and marine structures, including general cargo vessels, bulk carriers, reefers, oil and clean product tankers, ro-ro vehicle carriers, passenger ferries, cruise ships, patrol vessels, LPG and gas carriers, container ships, survey and support vessels, and yachts.

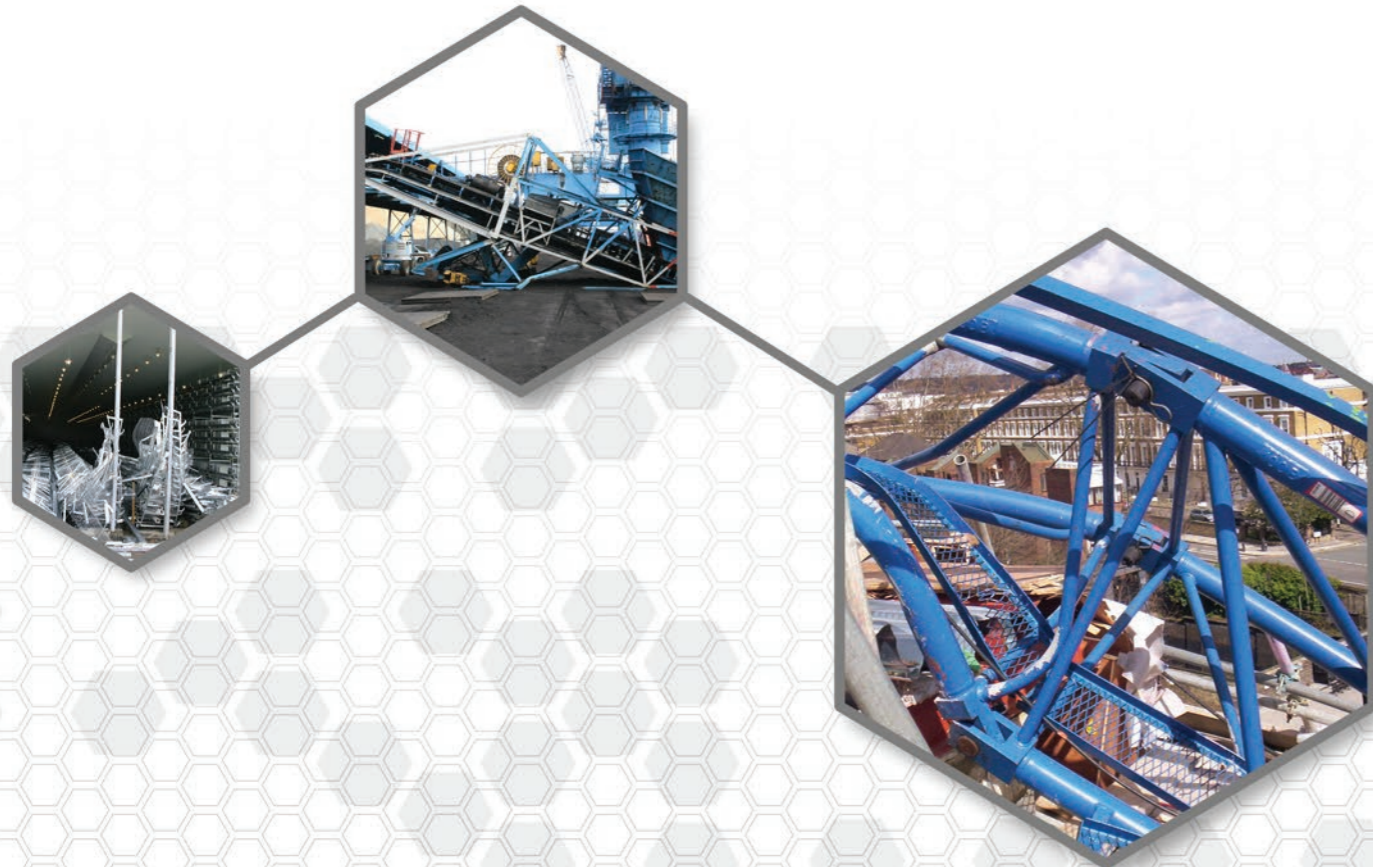
Our investigations have involved fires in shipyards and ports as well as those at sea. We have extensive experience of engine room, accommodation, cargo tank, cargo hold and container fires. We also provide expert advice on dealing with live fires and other cargo incidents on board vessels.



## Mechanical & Materials Engineering

Our mechanical and materials engineers are well known for their rigorous and effective approach to investigating diverse failures. Burgoynes' engineers have experience of investigating failures involving metals, polymers and paints, ceramics and refractories. They have investigated incidents and failures involving a wide range of equipment, including:

- Power generation equipment including gas and steam turbines
- Gears, bearings, compressors, motors and other rotating equipment
- Cranes, cradles, wire ropes and other lifting equipment
- Mobile elevated work platforms (MEWPs) or 'cherry pickers'
- Scaffolding, racking and other structural items
- Pressure vessels, reformers and other petrochemical plant components
- Boilers, heat exchangers and cooling systems
- Corrosion damage to tanks and structures
- Ship's engine components, propulsion equipment and steering gear.
- Aviation and aerospace components



## Fluid Escapes

Fluid escapes, including water and oil, can lead to substantial losses in premises including:

- Houses, flats and apartment buildings
- Offices
- Hotels
- Universities and research facilities
- Industrial premises

Thorough investigation of escapes of water and oil can usually identify the cause and the relevant parties with confidence so that recovery, repudiation and other issues can be progressed.

Our investigators of fluid escapes have diverse backgrounds including mechanical, chemical and materials engineering enabling us to determine the cause and influencing factors in all types of cases. We are fully familiar with boosted water systems, water hammer, joints of all types, waste pump systems and basement waterproofing failures.

We have a wide experience of investigating escapes of water and oil. Many of these have been major incidents and have resulted in large financial losses. The results of our investigations have been used in significant Court cases



## Electrical Engineering

We provide the highest quality, independent investigation of the cause of electrical breakdowns and failures including:

- HV and LV distribution systems
- Generator installations
- Power transformers, circuit breakers and other switchgear
- Cable joints and other cable installations
- Control equipment incorporating programmable controllers, conventional relay controls and switchgear
- Power utilisation equipment including motors, lighting and heating installations.
- Security and fire alarms, automatic fire systems, and CCTV surveillance
- Electronic apparatus including Printed Circuit Boards (PCBs)
- The characteristics and extent of damage caused by lightning strikes.
- Electrical faults giving rise to personal injury or electrocution



## Chemical Engineering and Process Incidents

Against the background of involvement in historically important cases such as Flixborough and Piper Alpha, our chemical engineers have extensive experience in the forensic investigation of a wide range of incidents. Examples of plant and processes where we have investigated incidents include:

- Tank farms - Buncefield, Thai Petrochemicals
- Smelters - Rio Tinto Kennecott Mines
- Off shore exploration / production – Deepwater Horizon
- Oil refineries – Singapore, Russia, Indonesia, Texas, Europe
- Oil pipelines – Germany, Shanghai, Turkey, Bolivia
- Solvent recovery
- Power stations – Drax, Shoreham
- Speciality chemicals
- Pharmaceuticals
- Foodstuffs
- Chlor-alkali
- Acid production and storage
- Reactors
- Distillation columns
- Separators
- Process dryers
- Dust explosions







## Structural Engineering

We investigate failures of permanent structures and temporary works in order to determine the cause of the incident and identify relevant factors in existing buildings and works under construction.

We have experience advising on:

- Failures and collapses of structures constructed of commonly used and specialist materials
- Failure of temporary works, scaffolding and excavation supports
- The cause of defects in existing buildings and works under construction
- Deficiencies in basements and underground structures such as failures of structurally integral waterproofing
- The cause of building issues related to ground movements and settlement
- Failures of retaining structures and free-standing walls
- Scope and suitability of remedial measures

## Personal Injury

Our scientists and engineers are regularly instructed to investigate matters involving personal injuries by parties acting for both Claimants and Defendants. Typical investigations include:

- Health and Safety Executive (HSE) driven investigations and prosecutions
- Workplace accidents
- Incidents involving industrial machinery and processes
- Pressure system explosions
- Slips, trips and falls
- Accidents involving lifts
- Falls from heights, including from ladders and scaffolds
- Electric shocks
- Carbon monoxide poisoning
- Incidents resulting from inadequate lighting
- Accidents involving power tools
- Accidents involving doors
- Product liability investigations



# Transport Incidents

The Traffic Collision Reconstruction team is based at our Stevenage office and has extensive experience and expertise in investigating incidents involving vehicles and items of plant. Most of these cases involve litigation and all of our experts have gained high reputations within the legal profession.

We have expertise investigating and reporting on:

- Matters that involve criminal charges and / or civil liability claims.
- Reconstructions of collisions between vehicles and involving pedestrians
- Reconstructions of incidents involving items of plant equipment
- Losses of control of vehicles, including rollovers
- Tachograph data analysis
- CCTV analysis and reconstruction, including 3D modelling and photogrammetric analyses
- Safety of loads on vehicles
- Vehicle component failures, including tyre failure analyses, seatbelt and automotive bulb analyses



In addition to accidents that happen on the roads we also have extensive experience investigating accidents with trains and rolling stock as well as aviation accidents. High profile cases involving rail and air include:

- The loss of Air India flight 182 (1985),
- The loss of Pan Am flight 103 over Lockerbie (1988),
- The loss of TWA flight 800 (1996),
- Southall rail crash (1997)
- The loss of Swissair flight 111 (1998),
- Ladbrooke Grove rail crash (1999)
- Hatfield rail crash (2000)
- An explosion involving a Thai Airways 737-400 at Don Mueang Airport Bangkok (2001),
- Selby rail crash (2001)
- Derailment at Ely (2007)
- The crash landing of Asiana Airlines flight 214 at San Francisco Airport (2013)
- Cargo hold fire, Philippines Airlines (2013)



## Contamination Assessment

Fires and chemical releases frequently result in the contamination of surrounding equipment and facilities. Burgoynes' materials, corrosion and chemical specialists can undertake site investigations to determine:

- If contamination has occurred
- The source of any contamination
- If the contamination can be attributed to a particular incident
- The nature and extent of any contamination
- Whether any contaminated equipment or stock can be cleaned and advise on the best methods for doing so, to ensure that swift remedial action can be initiated
- Any residual risks and advise on how cleaning, restoration and repair could mitigate these

## Microbiological Spoilage and Hazards

Microbiological growth can lead to problems in a wide range of situations, from agriculture to industry, from flooded homes to public water features. Microbes can pose risks to the health of users or passers-by or they can result in the blockage, malfunction and breakdown of machinery, to the loss of quality and shelf-life in raw or processed products and substantial problems in the transport chain.

Examples of areas where we can be of assistance are:

- Discoloration, gas production or swelling in stored drinks and foodstuffs
- Contamination in clean rooms and pharmaceutical premises
- The background to the creation of health hazards, such as Legionnaire's disease
- Moisture ingress or inadequate drying leading to spoilage of perishable cargo
- Microbial influenced corrosion (MIC) and the failure of protective measures
- Inadequate remediation of a problem leading to continuing complaints



## Recent Noteworthy Cases

Case Name	Year	Incident Description	Country
BAT, Kazakhstan	2013	Fire in cigarette warehouse.	Kazakhstan
Asiana Airlines, 777	2013	Boeing 777-28ER crash on runway at San Francisco.	USA
Airbus A330	2013	Fire in cargo hold of commercial passenger aircraft.	Philippines
Port of Tyne	2013	Fire and explosion in wood pellet transfer tower.	UK
TTOPCO, Kurdistan	2013	Fire in road tanker loading station at oil field.	Iraq
GE Sabiya	2014	Fire in generator at power station.	Kuwait
The Glasgow School of Art	2014	Large fire and smoke contamination.	UK
GE (General Electric), Druck	2014	Fire at factory.	UK
MSPO Plant, Moerdijk	2014	Explosion at chemical plant.	Netherlands
Irish Water	2014	Damage to underground cables.	Eire
Adani Power Tiroda Site	2014	Catastrophic failure of power distribution transformer.	India
Momentive Speciality Chemicals	2014	Major production loss.	Netherlands
Churchill Hyatt Regency Hotel	2014	Gas explosion.	UK
Clerkenwell Tunnel Flood	2015	Flooding at Farringdon Station.	UK
University of Aberdeen	2015	Leak from large water tank that flooded basement.	UK
Poynton Industrial Estate	2015	Large fire with significant damage to plant, machinery and stock.	UK
Battersea Arts Centre	2015	Large fire to arts centre.	UK
Bluewater Shopping Centre	2015	Sewage leak in large shopping centre.	UK
Clandon Park House	2015	Substantial fire in large country house and museum.	UK
Colchester Zoo	2015	Road train destroyed by fire.	UK
The Shard	2015	Escape of water from primary hot water system.	UK
PT Inadh Jaya	2016	Fire in warehouse of cotton bales .	Indonesia
The Address, Downtown	2016	Fire in hotel skyscraper.	Dubai

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