AusEng

Fire Forensics & Failure Investigations – Electrical & Energy Systems

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AusEng is an independent Australian engineering and scientific firm providing analysis, investigation, and advisory services across electrical, energy, and technology systems.

Our work is structured around three complementary pillars:

1. Independent Engineering & Scientific Analysis

Engineering-led and scientific analysis of electrical and energy systems, including measurement, modelling, standards interpretation, and technical review. This work supports evidence-based decision-making in complex and high-consequence environments.

2. Fire Forensics & Failure Investigations– Electrical & Energy Systems

Independent investigation of fires, failures, and system incidents involving electrical and energy systems. Services include origin and cause analysis, assessment of contributing factors, and reporting suitable for regulatory, coronial, insurance, and dispute contexts.

3. Business, Policy & Strategy – Electrical & Energy Systems

Advisory services to governments and businesses on policy, regulation, standards, and market frameworks affecting energy and technology systems. This work draws on engineering and scientific evidence to inform practical and implementable outcomes.

Pillar 2 – Fire Forensics & Failure Investigations– Electrical & Energy Systems

Introduction

Fire Forensics & Failure Investigations – Electrical & Energy Systems at AusEng involves independent engineering and scientific investigation of fires where electrical or energy systems are suspected to have played a role in initiation or propagation.

Such investigations commonly arise in complex, high-consequence matters involving insurance, regulatory review, or legal proceedings, where surface indicators alone are insufficient to establish cause.

AusEng's work focuses on understanding how energy was generated, controlled, distributed, and potentially released in a manner capable of initiating ignition.

Scope of Investigations

AusEng investigations commonly involve, but are not limited to:

- Electrical switchboards and power distribution systems
- Fixed wiring, joints, terminations, and protective devices
- Battery energy storage systems (EESS/BESS)
- Electric vehicles, charging systems, and e-mobility devices
- Solar photovoltaic systems and inverters
- Hybrid systems involving electrical, mechanical, and thermal interactions

Fires involving internal combustion engines (ICE) and mixed-technology systems may also be investigated where electrical or control systems are implicated.

Nature of the Problem

Fires involving electrical and energy systems frequently present challenges including:

- Severe thermal damage and loss of physical evidence
- Activation of protection systems prior to ignition
- Conflicting alarm, SCADA, or witness information
- Post-incident disturbance and recovery activities

As a result, determining origin and cause often requires disciplined engineering analysis rather than reliance on visual damage patterns alone.

Methodological Approach

AusEng applies an engineering-led, evidence-based methodology, which typically includes:

- Assessment of available physical evidence and artefacts
- Review of system configuration and operating context
- Correlation of physical evidence with operational data (where available)
- Identification and evaluation of plausible ignition mechanisms
- Consideration of alternative explanations and failure modes

Specialist techniques may be used where required, drawing on external laboratories and research institutions.

Separation of Evidence, Inference, and Uncertainty

A defining feature of AusEng's forensic work is explicit separation between:

- Observed facts supported directly by evidence
- Engineering inference supported by physical principles and system behavior
- Unresolved uncertainty where evidence is insufficient to discriminate between plausible mechanisms

Where the available evidence does not support a definitive conclusion, this is stated clearly.

Outputs

Depending on the engagement, AusEng outputs may include:

- Engineering reports addressing origin, cause, and ignition mechanism
- Technical analysis of electrical and energy-system behavior
- Review and critique of third-party opinions
- Expert input for insurance, regulatory, or legal processes

Reports are structured to withstand technical and legal scrutiny and to make clear the limits of the available evidence.

Independence

AusEng operates as an independent engineering and scientific consultancy.

Investigations are conducted without advocacy for any party. Conclusions are based solely on case-specific evidence, engineering analysis, and clearly stated assumptions.

Relationship to Capability & Background Material

Background information on AusEng's experience, institutional engagements, and technical capability is provided separately in the document AusEng Fire Investigations 2026.pdf. That material provides context only and does not predetermine conclusions in any individual investigation.