ELECTRICAL

FIRE

INVESTIGATION

TRAINING

PowerLogic

power in knowledge

ELECTRICAL FIRE INVESTIGATION TRAINING

All-inclusive training, set to become an industry standard

This course equips participants to effectively lead or support electrical fire incident investigations, making it essential training for electricians and electrical engineers. It can also increase the learnings for fire investigators.

Electricity often gets the blame for fires when no other cause can be found. Increasing the skills of those required to investigate fires will help ensure the correct origin and cause(s) are identified.

Competent investigations are crucial, but many electrical employees lack the know-how and technical expertise for proper fire investigation and problem identification.

Given the prevalence of litigation, businesses must be prepared to mitigate the impact of incidents, including fire incidents, and defend against potential claims or prosecution.

This course not only helps investigators to identify the origin and cause(s) of fires but also empowers staff with the skills and knowledge to proactively prevent such incidents occurring in the future and perhaps, save lives.

The course has been peer reviewed by one of Australia's leading experts in the field of electrical fire investigations and he makes the following comments:

"I have conducted a peer review of PowerLogic's Electrical Fire Investigation Training Course and think it is a very good and worthwhile course. The modules cover a wide range of incidents that electrical trades/professionals might encounter in the field.

The course will increase awareness of what to look for if and when they come across an electrically related fire, and to assess whether there was electrical involvement or not. The course also imparts a broad understanding of legal aspects and the role of the coroner.

Well done."

John Gardner

Electrical Engineer/Fire Investigator

COURSE CONTENT

This course comprises of 23 theory modules, with each module concluding with an assessment and one with a small assignment.

- Electrical Fire Investigations Introduction
- Electrical Fire Investigation Safety
- Legal Issues for Electrical Fire Investigations
- Causes, Effects and Prevention of Electrical Fires
- Fire Fundamentals
- Fire Flow Analysis and Patterns
- Electrical Fire Protection and Suppression Systems
- Electrical Cable Fire Mechanics
- Vehicle Electrical Fire Investigations
- Vessel Electrical Fire Investigation
- Battery Fire Investigations
- Domestic Electrical Fire Investigations
- Industrial and Mining Electrical Fires
- Solar System Fire Investigations
- Power Quality Initiated Fires
- Network Initiated Bushfires
- Forensic Electrical Fire Investigations:
  - Preplanning
  - First Response
  - Collect the Evidence
  - Analysis and Interpretation
  - Report Writing
  - Finalisation

“Our mission is to provide high-quality electrical training for the safety and well-being of all, including those in their homes and at work.”

Chris Halliday – In Person Trainer

With an extensive career spanning over four decades in the electrical industry, Chris is a distinguished expert in electric incident/shock investigation training, electrical safety, and power quality strategy.

He is regularly delivering presentations at numerous conferences and contributing articles to a variety of reputable trade publications.

Chris's qualifications include a Masters Degree in Electrical Power Engineering, a Graduate Diploma in Management, an Advanced Diploma in Occupational Health and Safety (OH&S), a Certificate IV in Training and Assessment, and an Advanced Certificate in Industrial Electronics. In addition, he holds a license as a Qualified Supervisor - Electrician in NSW, having initially started his career with an electrical trade before transitioning into the field of electrical engineering.

Chris is deeply passionate about elevating safety standards and advancing the level of safety education within the electrical industry.

”Our online training centre enables 24/7 access to all our training courses for those working in this specialised industry.”

Daniel Halliday – Online Trainer

Daniel brings a wealth of practical experience to PowerLogic with his 20+ years in the industry.

Daniel ran his own electrical contracting business through PowerLogic before swapping to training. He has experience in home automation, power quality investigations, energy management, comm’s cabling, and non-destructive testing of large motors and generators including thermal imaging.

He is a member of EESA, MEMMES and the Institute of Electrical Inspectors and represents IEI on some Australian Standards Committees. His qualifications include an Advanced Diploma in Electrical Engineering, Certificate IV in Workplace Health and Safety, Certificate IV in Training and Assessment, Certificate II in Air Conditioning and Refrigeration, Electrical Trade Certificate

He is a Licensed Electrical Supervisor - Electrician in NSW and is currently studying a bachelor’s in electrical engineering.

Electrical Fire Investigation Introduction

This module introduces the course and the need to identify the origin and cause(s) of the fire. It looks at the reasons for an electrical fire investigation depending on the organisation and limitations in doing the fire investigation and introduces the forensic investigation process.

Electrical Fire Investigation Safety

Electrical fire investigations can be a dangerous job. This module seeks to keep the electrical fire investigator safe throughout the investigation. It trains in the hazards and control measures to be used at fire scenes.

Legal Issues for Electrical Fire Investigations

This module investigates the generic legal issues associated with an electrical fire investigation, electrical installations and equipment compliance, electrical work compliance, and giving evidence in court. It also discusses arson and associated motives, the role of the coroner with fires, evidence preservation legal requirements, legal requirements for workplaces to prevent fires, etc.

Causes, Effects and Prevention of Electrical Fires

The causes of electrical fires are investigated using the Swiss Cheese Model including things like overloads, short-circuits, etc. The effects of Incidents are detailed in this module.

Root Cause Analysis (RCA) is briefly introduced to identify the causes of incidents, including underlying causes, so corrective and preventative actions can be formulated. Preventative techniques to prevent electrical fires are also introduced.

Fire Fundamentals

The basics of how a fire is started and maintained are introduced as this is fundamental to investigating fires of any type. Fuels, the need for oxygen or an oxidising agent, flash and fire points, and flashover are all introduced in this module.

Fire Flow Analysis and Patterns

Flow paths, intakes and exhausts, high and low pressures, fuel or ventilation controlled fires, fire effects, fire patterns are all introduced in this module. An electrical fire that destroyed a whole school is discussed as a case study.

Electrical Fire Protection and Suppression Systems

This module trains in passive and active fire protection systems, and suppression systems that help to control fires once started. Fire detection and alarm systems are included in this module. Arc Fault Detection Devices are also introduced.

Electrical Cable Fire Mechanics

Conductor and cable insulation types and what happens if they initiate a fire or damaged by a fire including damage mechanisms are discussed. Arc beads versus globules and the pros and cons of arc surveying/mapping including within a piece of electrical equipment are also investigated in this module.

Electrical Design and Installation Issues that cause Electrical Fires

Various issues around the design of an electrical installation are trained including looking at the Wiring Rules and electrician requirements that help to prevent the spread of electrical fires. A copy of the Wiring Rules is needed for this module.

Vehicle Electrical Fire Investigations

Legislation and standards relevant to vehicles, factors unique to vehicles, causation factor statistics, areas of origin, types of electrical fire failures, recall notices and case studies are all investigated in this module.

Vessel Electrical Fire Investigations

This module includes factors unique to vessels, onboard fuels and power sources, electrical ignition sources, legislation and reporting, relevant electrical standards, Australian incident statistics and common issues that cause electrical vessel fires are all trained in this module. The module also includes how vessels should be managed to prevent electrical fires and case studies.

Battery Fire Investigations

Battery fires are on the increase with the proliferation of lithium-ion batteries. This module explores issues associated with standards, legislation, various battery types, causes of battery fires including design, installation, charging, maintenance, end of battery life and case studies.

Domestic Electrical Fire Investigations

Statistics, risks and risk factors, relevant standards and legislation, electrical equipment compliance including recalls and prescribed or declared articles, various types of electrical fires and case studies are all explored in this module.

Industrial and Mining Electrical Fire Investigations

Maintaining production is essential for the survival of many industries and fires can disrupt or prevent future production. This module looks at issues including standards, legislation, causes of fires in industrial and mining situations including sparks in hazardous areas, wind turbines, power transformers, circuit breakers, and switchboard fires. Case studies are included.

Solar System Fire Investigations

Fires from solar systems is on the increase. Issues trained include standards, statistics, causes, dousing fires, solar panel fire safety, recall notices and case studies.

Power Quality Initiated Fires

Poor power quality can start fires and is often not even considered in an electrical fire investigation. Sources of ignition trained include sustained voltage levels, harmonics, voltage unbalance and 3-phase motors, and ‘surges’ or what should be called impulsive transients from lightning.

Network Initiated Bushfires

Network initiated bushfires can have terrible and devastating consequences. These fires increase in the summer months and early autumn.

Various issues are trained including standards and legislation, sources of network initiated bushfires, clearances from powerlines, sparks from conductors and vegetation, fire patterns, poletop fires, evidence collection, and case studies.

Forensic Electrical Fire Investigations

This section is divided into six training modules:

Preplanning

Being prepared for a forensic investigation of an electrical initiated fire is important. This module prepares individuals and companies for an investigation. The module looks at investigation procedures, forms, training, report writing templates, equipment issues and evidence storage preparations from an electrical fire investigation perspective.

First Response

This module details requirements to ensure no further victims fall foul to risks at the fire scene. Additionally, requirements in allowing 'the rescue', securing the incident scene, reporting to the authorities, establishing an investigation team, and investigating ASAP are important, and parallel investigation issues are all covered in this module. It is to be realised that the electrical fire investigator is likely to be involved after the fire has been doused and perhaps even days or months later.

Collecting the Evidence

Scene examination, evidence gathering including documenting the scene, sketching, collecting visual evidence, and the collection of electrical evidence are detailed in this module. The collection of evidence via interviews is all important and so requirements and interview techniques are discussed. Offsite evidence and evidence preservation are also detailed.

Analysis and Interpretation

In this module, all the evidence is analysed and interpreted, materials are analysed and examined as necessary, a hypothesis is developed, and an action plan is developed to rectify and prevent further incidents. The module includes developing a sequence of events to help with the analysis and discusses electrical evidence issues such as disturbing the electrical equipment through the investigation process.

Report Writing

A report can be formulated from the analysis and interpretation of all the evidence. Reports take various formats, but a written report is important. What to include, what not to include, and formatting mistakes are investigated in this module so a high-quality report can be formulated.

Finalisation

This course is concluded with finalising corrective and preventative actions, conducting a post-investigation review, ensuring counselling is provided, final reporting and completing of all internal records.