safearth training

Fundamentals of Earthing Testing

3 Day Training Course

Auckland | Brisbane | Hobart | Melbourne | Newcastle | Perth | Townsville

This is the premier earth testing training course in the region – an intense program in fundamental earth assessment principles and the practice of earth testing.

Participants will develop an understanding of the science behind earthing, and put into practice the skills associated with testing and the interpretation of test results.

Defence · Oil & Gas · Construction · Rail · Roads · Tunnelling · Power · Renewables · Mining · Industrial

Safearth is Australia's leading provider of services and solutions in earthing and lightning protection.

Safearth has designed and tested thousands of earthing and lightning protection systems and has been a key force behind the national and international development of earthing theory and practice. Now you too can learn from the masters and develop your own expertise to support your business.

This course provides essential foundational knowledge and skills for all involved with electrical power system earthing.

Who Should Attend?

This in depth course is designed for asset, project and maintenance managers, engineers and other technical staff responsible for power system or other assets dependent on earthing systems for their safe and reliable operation. It provides essential underpinning knowledge and skills for all involved with earthing electrical power systems.

A solid background in electrical engineering is essential.

Course Objective

The complexities of assessing earthing system by test are explained in this course through the application of theoretical and practical sessions.

This 3-day course provides a comprehensive treatment of the principles and practices used to test earthing systems to effectively assess their performance, condition and risk. The course includes lectures with practical examples, as well as a full day of hands-on field testing.

Our key staff have a combined total of more than 100 years experience in earthing system design, testing and refurbishment, of assets ranging from power stations through to distribution networks.

Course Deliverables

Provide participants with the knowledge and skills necessary to test and assess earthing systems associated with the electricity supply infrastructure and industrial installations and address practical aspects of resistivity and injection testing.

Discuss the safety aspects of installation, maintenance and operation of earthing systems.

Utilise the concept of inductive and conductive effects to understand earthing system response while testing and techniques for assessing earthing systems, using both empirical and analytical techniques.

Pricing

Standard price for this course varies depending on location. Discounts are available for early-bird payments and for group bookings.

Payments can be made by credit card via our website, by direct deposit or by purchase order in advance.

Further information is available on our website.

What You Will Learn During This Course

Earthing System Performance

- What is Earth Potential Rise?
- How do current distributions help understand earthing system behaviour?
- Measuring touch and step voltages and predicting worst case locations.

Soil Resistivity Testing

- Impact on performance
- Test Types
- Robust execution methods
- Result Analysis
- Hazards & Pitfalls

Commissioning Earthing System

- What test method to use
- What is a current injection test?
- Mutual effects impacting current injection tests
- Test planning and coordination
- Injection equipment

Operational Safety Earthing

- Use and maintenance of portable and permanent earths
- Rating and type testing

Earthing System Testing

- What is the right process?
- How do I test an earth grid, taking into account soil resistivity, protection settings, network configuration and auxiliary paths?
- What's the difference between earth grid performance and earthing network performance?
- Why is test configuration so important?

Soil Resistivity

- What are the electrical properties of soil?
- How do they vary and how can I measure them?
- How can I recognise inadequate test results?

Earth Potential Rise (EPR)

- What happens when current flows into the ground?
- How and where do touch voltages appear?
- How do I determine where to measure EPR and what is remote earth?

The Earth Fault Circuit

- Where does earth fault current actually flow?
- Are interconnections to other earthing systems helpful or hazardous?
- What is inductive coupling and how does it guide current flow?

Transferred Hazards

- Measuring hazards on other systems, like comms, pipes, fences, conveyors and railway lines?
- How do overhead earth wires, affect touch voltages?

Analysis Case Studies

- Interpreting test results and how to build a picture of earthing system performance under real world fault conditions
- How does the earthing system performance change for different fault scenarios?
- Quantifying the relative merits of various mitigations options based on test results?

What Participants Say

"Course material was presented in a straightforward, easy to understand manner."

"When we asked questions, they had answers."

"The presenters delivered the subject matters clearly using various tools shared with their valued practical experience..."

Assessment Benefits

How can a test:

- effectively qualify earthing risk?
- help achieve operational security?
- reduce project installation cost?
- reduce lifetime costs?

Construction Safety

- Issues involved with construction and maintenance within and adjacent to live substation yards.
- How education changes risk
- Staging works to minimise the impact of earthing risks on workers and the public

Maintenance and Refurbishment

- Maintenance and supervision methods for earthing systems
- Performance review and refurbishment process
- Delivering an Earthing System Management Plan

For specific course dates, or to apply for this course, visit safearth.com/training

About Safearth Training

Safearth have been at the forefront of earthing in Australia for more than 25 years. We delivered Australia's first public earthing training course in the early 1990s and have since trained hundreds of people both here and around the world.

Our trainers are all earthing experts with substantial experience in both R&D and practical application. We know about real-world problems and constraints, and have provided thousands of solutions, in design, testing and refurbishment of assets across all industries.

Safearth also helped develop the standards you use – we were key in the development of EG-1 and EG-0 and serve on the committees for AS 2067, AS/NZS 1768, AS/NZS 3007, IEEE 80, IEEE 81, IEEE 998 and others.

All our training courses include a balance of theoretical background and practical application. Most include the use of computer programs, including Safearth software and other readily available applications. All courses include real-world examples and, where appropriate, field demonstrations.

PROFESSIONAL TRAINING BY INDUSTRY LEADERS

For detailed course information, or to apply for a course, visit safearth.com/training

Other Safearth Training Courses

Safearth offers a wide range of public and customised courses to suit your needs, including:

- Fundamentals of Earthing Design — 3 days
- AS2067:2016 – The Changes and Impacts — 2 days
- Earthing Awareness — ½ day (4 hrs)
- Introduction to Routine Earth Testing — 1 day
- Introduction to Earthing Design — 1 day
- Earthing for Project Managers — 1 day
- Earthing System Management Planning — 1 day
- Distribution Earthing Design & Testing — 1 day

And ask us about licensing our award-winning training video for non-electrical staff and contractors.

See our website for more information.

More About Safearth

Safearth Consulting is a specialist engineering group providing world recognised expertise in all areas relating to earthing systems.

Safearth provides products and services for the design, specification, installation support and commissioning of new earthing systems, as well as ongoing testing and refurbishment support for existing systems.

Our experience extends to all areas of power generation, reticulation and use, including substations, transmission and distribution systems, power stations, industrial plants and mining operations.

As well as our training services, we also offer:

Consulting

Safearth can provide engineering support for all your earthing needs, including design/test, policy and standards development, incident investigation and asset management.

Instruments

We design and build earthing test instruments with a focus on robust and reliable measurements of new and in-service earthing systems.

Software

Safearth has a long history of developing software for analysing earthing related problems. We are now making some of this software commercially available.

Why not tell us what you need?

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