EARTHING, BONDING, LIGHTNING & SURGE PROTECTION CONFERENCE

DISCOUNTS

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BENEFITS OF ATTENDING:

- Update your knowledge on best practice and find practical solutions in earthing, lightning and surge protection technologies
- Learn about current earthing and lightning protection projects happening in New Zealand
- See how AUS/NZ Standards are being successfully applied to local projects
- Learn how optimal electrical earthing, lightning and surge protection design can improve production and reduce costs
- Learn how effectively to select, install and coordinate Surge Protection Devices (SPDs)
- Learn how local engineers are designing earthing and lightning protection for New Zealand's high resistivity soil regions
- Gain best practice skills to design, test and install portable earthing and bonding
- Learn how to use the AS/NZS1768 assessment tool in your lightning protection design
- Learn about the new methodology for analysing transmission line lightning performance
- Network with experienced experts and your peers

WHO SHOULD ATTEND:

- Electrical Engineers and Technicians
- Engineering Managers
- Project and Design Engineers
- Instrumentation and Control Technicians and Engineers
- Plant Operators
- Safety Facilitators
- Process Safety and Loss Prevention Managers
- Government Safety Regulators/ Inspectors
- OHS/Training Managers who want to better understand best practice in earthing and lightning
- Risk Assessors

And all other Engineering Professionals who have an interest in earthing, lightning and surge protection

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18th & 19th September 2012

Rydges, Auckland, New Zealand

Featuring Keynote Speaker:

TONY MITTON

Power Engineering Consultant and Chairman of the Institute of Engineering and Technology (IET)

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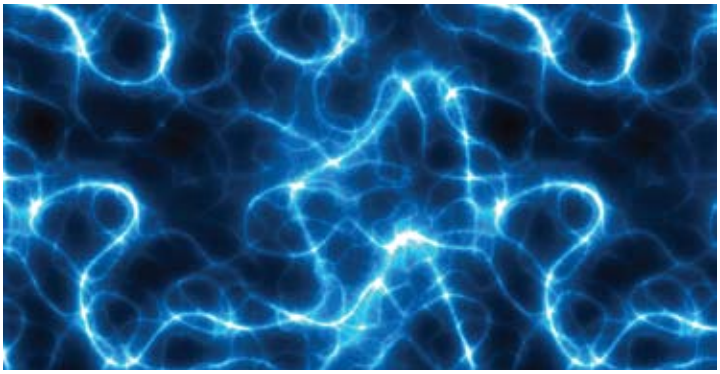
INTRODUCTION TO EARTHING, BONDING, LIGHTNING & SURGE PROTECTION

Few topics generate as much controversy and debate as that of earthing and the associated topics of surge protection, shielding and lightning protection of electrical and electronic systems. Poor earthing practices can be the cause of continual and intermittent difficult-to-diagnose problems in a facility. One of the most common problems with earthing in New Zealand is the nature of the general soil condition. Rocky soil and high resistance earthing is "the beast" engineering professionals have to work with especially when trying to properly coordinate protection grading. This conference will explore these issues from a fresh yet practical perspective to help you reduce expensive downtime in your plant and/or equipment by applying the correct principles effectively. It will attempt to remedy the gaps in technical knowledge and improve practices in the industry. New Zealand needs a unified approach to earthing, bonding, lightning and surge protection which can be commonly understood and widely applied.



CONFERENCE DAY 1 – 18th September 2012

8.00am **Registration**

8.15am **Opening Address**

8.30am **HALF DAY WORKSHOP**

Includes **Morning Tea - 10.30am**

See back page for Tony Mitton's bio

A Toolkit of Principles and Best Practices in Earthing

Session 1 — KEY NOTE

Tony Mitton - Power Engineering Consultant

This workshop will provide you with a refresher of earthing principles and best practices, including testing. We will discuss the many forms of earthing and their requirements ranging from generating stations, high voltage substations, transmission lines, lightning protection, temporary earthing, mining, distribution and low voltage reticulation. This workshop will cover typical issues of design and testing methods and will give examples of inadequate or faulty earthing practices. You will learn the importance of understanding the principles behind each form of earthing and why simply following routine practices and methods is not always sufficient.

Lunch - 12.30pm

1.30pm **Design, Installation and Testing of a 25kV AC Traction Earthing System in Auckland**

Session 2 — CASE STUDY

Niraj Garimella - Electrical Engineer, AECOM

KiwiRail is undertaking the modernisation of the Auckland suburban railway network through a number of related projects, including the Auckland Electrification Project (AEP). The AEP will expose the public to the rail voltage rise at train stations and level crossings and will introduce aerial 25kV reticulation to residential and frequented public areas. This paper describes the main features of the traction earthing system used in this project, including overall system design in high resistivity areas, protective provisions for public areas, segregation from other earthing systems and interference to pipelines and telecommunication systems. It will also give a summary of the verification testing undertaken.

2.15pm **Surge Protection - Control and Instrumentation**

Session 3

Geoff Thomson - Technical Manager, Cuthbert Stewart Ltd

There is a great deal of misunderstanding with regards to the installation of Control and Instrumentation (C&I) Surge Protection Devices (SPD) in industrial plants. This presentation will attempt to remedy the gaps in technical knowledge. You will gain an insight into the effect of lightning strikes and overvoltage transients on industrial plants and the importance of risk analysis in evaluating crucial circuits. You will learn about, SPD design evolution, terminology and the application of Power SPD versus C&I SPD. Using a number of application examples, this presentation will also debate galvanic isolation versus surge protection and give you tips on screening/shielding and installation best practice.

Afternoon Tea - 3.00pm

3.30pm **Surge Protection Device Selection Criteria for Buildings**

Session 4

Rohit Narayan - Facility Electrical Protection, ERICO

This presentation will cover the selection and application of Surge Protection Devices (SPDs) for buildings and telecommunications facilities. The key criteria for selection of SPDs including the standard ratings will be discussed along with the alarm, monitoring and physical features. You will learn about the differences and similarities between the relevant standards for the selection and application of SPDs, IEC61643, UL1449-Ed3 and AS/NZS 1768. The advantages and disadvantages of the three most common surge protection topologies used in New Zealand (shunt, cascaded shunt and series surge reduction) will also be debated. The topology for telecommunications line surge protection will be demonstrated and the presentation will conclude with an opportunity for you to develop a sample performance specification for a main switchboard and distribution board at a typical commercial facility, based on knowledge gained from this presentation.

4.15pm **Best EMC Installation Practice for Variables Speed Drives – Understanding the Main Differences Between Earthing and Bonding**

Session 5

Eduardo Gie - Pacific Technical Manager, Danfoss

The application of variable speed drives (VSDs) / variable frequency drives (VFDs) are well-known for their benefits for energy efficiency and flexible control of process and machinery. However, if not designed or installed correctly, they may cause problems elsewhere in the electrical system which can result in non-compliance with regulatory requirements and loss of revenue. Taking a "prevention is better than cure" approach during the upfront design, selection and installation of VFDs can ensure these problems are avoided. This presentation highlights the recommended EMC best practices to avoid undesired electromagnetic interference when installing VFDs in commercial and industrial applications. You will learn how following best practise principals can enhance the equipment performance and help ensure reliable operation and compliance with EMC regulations.

Closing - 5.00pm

NETWORKING SESSION

Cocktail Hour - 5.00pm to 6.00pm

An hour dedicated for all attendees to meet and socialise with experts and industry peers at the Conference Cocktail Hour.

Sponsorship Opportunities

Representing your business at the 2012 Earthing, Bonding, Lightning & Surge Protection Conference will provide you the chance to reach key decision makers from a multitude of industries.

For more information on sponsorship and exhibition opportunities please contact Arna Holmes via email arna.holmes@idc-online.com

CONFERENCE DAY 2 – 19th September 2012

8.30am | Session 6 | KEY NOTE

Earthing Investigations, Analysis and Solutions

Tony Mitton - Power Engineering Consultant

This key note presentation will discuss real-world issues found in earthing using local and international case studies. It will demonstrate how using sound earthing principles and experience to implement or investigate issues is paramount to avoiding a serious earthing defect. Earthing theory is generally well understood but knowing how to put this theory into practice is a skill. This presentation will discuss a variety of actual earthing defects or failure events, in both HV and LV systems. You will learn about the associated investigations and the actions taken to remedy the issues so that you will be better equipped when faced with similar situations in your line of work.

9.30am | Session 7

The "Wave Breaking Factor" and its Vital Role in Surge Protection Device Coordination

Hans Slagter - DEHN + SÖHNE

Coordination between more than one set of Surge Protection Devices (SPDs) is a complex matter. In the case of voltage- limiting type SPDs, the cabling with distance between the two sets SPDs, representing impedance may be used as a decoupling element. This decoupling impedance is in general only effective for short waveshapes (for example 8/20). With long waveshapes (for example 10/350), this natural decoupling impedance created by the cabling is rarely sufficient. Often SPD manufacturers neglect to consider or provide coordination details. This analytical study presentation will demonstrate the importance of selective coordination of different types of SPDs and the "Wave Breaking Factor".

Morning Tea - 10.15am

10.45am | Session 8 | CASE STUDY

Lightning Protection Techniques Commonly Used in New Zealand and Australia

Wayne Mu - Engineer, Enertec Power Solutions

This presentation will discuss the methods of lightning protection that are commonly used in New Zealand and Australia. It will discuss how to effectively use the risk assessment tool in AS/NZS1768 for your lightning protection design. You will get an overview of design rules and key criteria for writing specifications for conventional lightning protection systems. It will use examples from a variety of case studies including a Victorian Desalination Plant and Eden Park Auckland to demonstrate the advantages and limitations of non-conventional approaches to lightning protection system design.

11.30am | Session 9

New Approach to Monitor the Integrity of the Grounding Grids' Horizontal Elements

Yury Chikarov - School of Electrical Engineering, Auckland University of Technology

Grounding provides not only safety, but in some cases a return circuit for load currents and uniform distribution of the voltage. If grounding conductors are damaged, it can cause hazardous potentials for people and plant. It can also result in failure of the grounding device itself, secondary circuits' cables and structural elements. This study discusses a new approach to the problem of monitoring the integrity of grounding grids' horizontal elements. It will present results based on mathematical and experimental studies. You will learn how this method has the potential to reduce labour cost and time for detection, while increasing accuracy of the grounding grids' monitoring.

Lunch - 12.15pm

1.15pm | Session 10 | CASE STUDY

Effective Lightning Discharge Current Dissipation of the Chelsea New Zealand Refinery Replacement Chimney

Dr. Tony Auditoré - Principal Consultant, LineTech Consulting

New Zealand Sugar's, Chelsea site in Auckland recently replaced their 60 year old damaged concrete chimney with a stainless steel chimney. Due to the high profile of the chimney and the risk to both operational staff and plant, it was crucial to design an effective lightning protection system (LPS). This paper will analyse the two LPS options suggested for this project as well as the effectiveness of the stainless steel chimney and its earthing in dissipating charge of static electricity. The recently revised standard *AS/NZS 60479.4:2010 Effects of current on human beings and livestock - Effects of lightning strokes on human beings and livestock* is referred to for providing quantitative guidelines for unsafe voltage limits.

2.00pm | Session 11 | CASE STUDY

Transmission Line Lightning Protection and Earthing Design in High Resistivity Soil Regions

Rodney Urban - Associate Director, AECOM

Overhead earth wire and tower earthing designs have a significant impact on the lightning performance of HV and EHV transmission lines. Conventional design tools use lightning and earthing input parameters, averaged over the extent of the line which does not allow us to identify localised areas of poor performance. This paper presents a more rigorous method of analysing transmission line lightning performance using modern analysis tools. It will examine case studies including the developed designs for adjacent 500kV circuit outages along a narrow mountainous corridor in Canada, a 220kV line in New Zealand and a complex DC traction feeder design on an elevated viaduct structure in Australia.

Afternoon Tea - 2.45pm

3.15pm | Session 12 | CASE STUDY

Demystifying Portable Temporary Earthing and Bonding

Greg Bocks - Medium Voltage Systems, Sicame Australia

Portable "safety" earths have been used in the electricity industry for a long time. Over the years fault levels and work practices have changed significantly. Unfortunately, portable temporary earthing and bonding requirements are often forgotten or misunderstood. This paper discusses the requirements for portable earthing taking into consideration the electrical, mechanical, work safety and IEC Standards performance aspects for HV, MV and LV situations. The additional requirements for LV earths are also discussed as these earths are not only used for electrical safety applications. The paper will cover the design, testing, installation and maintenance of portable earths and will use several case studies to highlight the various aspects of the paper.

4.00pm | Session 13

Discussion Panel

This session will provide delegates with the opportunity to ask speakers questions and discuss their earthing, bonding, lightning and surge protection issues, covering typical problems and possible solutions.

Closing - 4.45pm

All conference papers are reviewed and selected for their high quality and technical value by our panel of specialists experienced in the theory and practice of earthing, bonding, lightning and surge protection.

KEYNOTE SPEAKER

TONY MITTON - Power Engineering Consultant and Chairman of the Institute of Engineering and Technology (IET)

Tony Mitton is a power engineer with over 30 years in electricity transmission and distribution engineering in NZ and overseas. His experience includes substation design, project and site management, commissioning, earthing design and testing and special investigations. Tony also developed practical means to test earth grid using off-frequency low current injection methods. From 1990 to 2007 Tony was the manager of his own consulting company which was then merged to form Mitton ElectroNet Ltd. Tony assisted the Electricity Engineers Association to prepare a new Guide to Power System Earthing Practice and was also on the Energy Network Association working group for the EG-0 Power Systems Earthing Guide.

Registration Form: Earthing, Bonding, Lightning & Surge Protection Conference

18th & 19th September 2012, Rydges, Auckland, New Zealand

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NOTE: Third delegate is free if registering two other participants

Discounts for larger groups available, please contact us for more information.

PLEASE NOTE: Full payment is required prior to the commencement of the conference.

Sub-total = $

+ GST = $

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GENERAL INFORMATION

Confirmation Details

A confirmation email will be emailed to you within 3 working days of receiving your registration.

Cancellation Policy

Full reimbursement will be accepted if written notification of cancellation is received by IDC Technologies on or before 3rd September 2012. A fee of 20% will apply to any cancellations received between 3rd September and 10th September 2012. No cancellation requests can be accepted after 10th September 2012 however substitute delegates are welcome.

Venue

Rydges Auckland
59 Federal Street
Central City Auckland 1010
Phone (09) 375 5900

Accommodation

Accommodation is available at the conference venue from $139 per night. A booking reference will be provided with confirmation of your registration.

Food and Beverages

All lunches, morning and afternoon refreshments are included.

Unable to Attend

If you are unable to attend the full conference program, contact us for details to attend individual sessions or to purchase the Conference Resource Kit.

Enquiries

Contact conference coordinator Arna Holmes by phone: (09) 263 4959 or email: conferences@idc-online.com

REGISTRATIONS

We encourage you to register early, as spaces are limited. Your payment must accompany the registration form in order for it to be processed and confirmed.

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