High Voltage Conference

28th & 29th September 2022

Crowne Plaza Melbourne, Victoria

Keynote Speaker

Stephen Palmer

- Managing Director at Safearth
- Originally Australia's leading earthing specialists, but now a true international business
- Committee Member for IEEE Std80, Std81, Std 837, Std 998, Std 1268 & Std 1246
- Convenor of the International CIGRE Working Group B3.54
- Secretary of the CIGRE & CIRED Joint Working Group B3.35 who produced TB 749

What You Will Gain From Attending?

- Update your knowledge of international grounding design and testing Standards worldwide
- Find practical solutions to your HV design and installations issues
- Discuss and review the changes to the AS 2067 standard in relation to earthing
- Learn how to extend the life of your HV equipment through effective condition monitoring, testing and diagnostic techniques
- Understand earthing risk and determine appropriate safety criteria
- Discover the most effective partial discharge detection techniques
- Hear about the latest arc flash standards and how they will affect the HV industry
- Learn how to avoid transformer failures with oil and electrical testing
- Understand best practice for life management of power transformers
- Hear relevant local case studies from the Australian electrical industry
- Network with specialists in the field and your peers
- No sales pitches – non commercial presentations

Who Should Attend?

- Substation engineers and technicians
- Generation, transmission engineers and technicians
- Electrical engineers, technicians and electricians
- Maintenance engineers and asset managers
- Plant, project and design engineers
- Industrial organisations with high HV electrical distribution
- Engineering and safety managers
- Renewable energy specialists
- Government safety regulators/inspectors
- Network, protection and distribution engineers and technicians
- Risk assessors
- Maintenance specialists

And all other engineering professionals who have an interest in HV design, standards, installations, operations and maintenance.

Presented by: IDC Technologies

Education Partner: EIT Engineering Institute of Technology.

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Media Sponsor: Transmission & Distribution, Industrial Electrix

Discounts

Early Bird Offer!
10% Off
Book on or before 15th August 2022

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See back page for details

Introduction to High Voltage

This conference has been created for those working with high voltage systems in the mining, industrial plants, oil and gas and utilities industries. The event will focus on earthing, design, testing, installation and maintenance topics.

The high voltage installation can range from a substation, auxiliary systems, interconnecting cables/lines and naturally the user's facilities such a plant, factory, office facility and mine site. Equipment includes switchgear, transformers, converters, cables, lines, batteries, earthing systems, capacitors, reactors, buildings and structures. The conference will cover the AS 2067:2016 HV standard which provides minimum requirements for the design and installation of high voltages above 1kV (ac) so as to provide safe functioning in operation.

In addition to HV design and installation, HV maintenance is a challenging undertaking and the Australian industry needs to have the sustainability and reliability of ageing HV equipment at the forefront of their minds when planning and designing their upcoming projects. The conference will discuss problems that arise from HV equipment maintenance and how industry can overcome these issues through well planned maintenance programs, adherence to standards/regulations and forward thinking.

Conference Program – Day One

28th September 2022

8:00am – Registrations Open

8:25am – Opening Address

Chairperson: Andrew Maunder
Managing Director, Safetylec Management Solutions

8:30am – Session 1 KEY NOTE

International Update - An update on Grounding Design and Testing Standards Directions and Changes around the World

Stephen Palmer – Managing Director at Safearth
Convenor of the International CIGRE Working Group B3.54

In many countries, including the Americas, asset owners and designers rely on the guidance of IEEE standards including Std 80, 81, 837, 1246 & 1268, for most aspects of substation earthing. However, there are a number of other international earthing documents with international significance. Documents such as IEC 61936 and EN 50522 are relied on extensively, but these are all heading for further change. Of significance is the growing value placed on measurement of actual performance rather than traditional reliance on estimates using complex tools and limited models. This presentation will summarise the most significant changes of recent history and the directions that are being signalled for current and future revisions. Consideration of a number of possibilities will be provided along with a discussion of the possible consequences of following or not following these international directions.

9:30am – Session 2 CASE STUDY

Defects identified within high voltage switchgear and cables via online Patrial Discharge testing

Brad Monaghan - Head of Services, Senior Technician at EA Technology

Real life case studies from the field presented by EA Technology's Brad Monaghan. The case studies will cover a range of partial discharge defects identified within high voltage switchgear and cables. Brad will demonstrate how the defects were identified by using non-intrusive test methods via hand held test instrumentation. The range of different test techniques – both their strengths and limitations, used during testing will be discussed. Photographs from the field and real-life data including phase resolved partial discharge patterns will be displayed. Included are the likely causes of the discharging defects and how the network operator responded to the defects.

10:15am – Morning Tea

11:00am – Session 3 CASE STUDY

Maximising the Success of Predictive High Voltage Maintenance

Jackson Hill – Director and Principal Engineer, Live HV

For several years, high voltage cable testing had been provided for a prominent mining site in NSW. Analysis of testing data had identified several potential failures and predicted a precise location of where these failures would occur.

Five years after the incipient faults were first detected the cables began to fail at the predicted locations. Although the effectiveness of the testing was proved, the resultant adverse outcome for the mining site highlighted several areas where improvement could be achieved.

11:45am – Session 4

Arc Flash Hazards in HV Contexts

Ryan Hudson - Principal, BSA Power System Engineering

Developing an awareness of Arc Flash Hazard (AFH) assessment and mitigation allows for improvements in worker safety and supports industry in addressing PCBU obligations. While local interest in assessment and management of AFH is growing, delivering certainty of compliance remains ambiguous. Using AS2067 as the starting point for understanding AFH management in HV contexts, an Australian perspective is developed, with a literature review and case studies to support observations. Results demonstrate that work needs to be done on alignment of methodologies. However, application of good engineering practices shows that the informed HV industry participant is conclusively better placed to safely manage this hazard..

12:30pm – Lunch

1:15pm – Session 5

Transformers – Natural Ester Retro-filling, Oil Testing & Management

Phil Reilly - Business Development Manager ANZ, Cargill Bioindustrial

- Reasons to retrofill - fire safety, improved asset aging profile, enhanced load capacity & environmental footprint.
- The retro fill process – considerations.
- Ongoing condition assessment with annual oil analysis. Testing and interpretation of results to evaluate the condition of the liquid and solid insulation. Appropriate actions available to further investigate & manage faults.

2:00pm – Session 6 CASE STUDY

Wow, I Got To Audit a Wind Farm

Andrew Maunder – Managing Director, Safetylec Management Solutions

In 2017/18 I was lucky enough to be contracted to audit the HV installation of Queensland's first ever privately-owned wind farms at Mt Emerald Far North Queensland. As it turns out I was the first accredited auditor in Queensland to audit a privately-owned major wind farm project. The project consisted of fifty-three wind turbines, 33kv underground distribution into RMU units located at the bottom of each wind turbine and two switching yards. This presentation will talk about the challenges of auditing such a large installation including the North Queensland Monsoons, the fact the towers where built on the side of a mountain, existing energised 275kv overhead power lines and the methodology of excavating the supply cables. "You gotta listen to this" as I guarantee not too many engineers or contractors have had to undertake this method of trenching. Furthermore the project had strict environmental issues with regards to the little animal called the Northern Quoll. And with all that to contend with, the project had three different electrical contractors that weren't really coordinating or talking to each other - "Oh The Fun".

2:45pm – Afternoon Tea

3:15pm – Session 7

Off and ON-line Acceptance Testing and Diagnostic testing of Distribution Cables

Karl Haubner - Applications Engineer and High Voltage Test Application Specialist – Asia Pacific, Doble Engineering Company

More searching Acceptance Testing and ongoing Condition Monitoring is an important strategy to improve the reliability of Medium Voltage distribution cable networks. The industry requires simple and cost-effective commissioning and diagnostic tools that accurately assess the cable insulation condition.

The paper reviews the most commonly performed offline and online diagnostic tests to determine different defects. Using several case studies the benefit of each of these techniques is described and how the combination of the above tests can identify weaknesses to build up a comprehensive picture of the insulation condition of the cable to improve the reliability of the network. During the practical part of the presentation real time cable PD testing / mapping and UHF/RFI techniques applicable to cable terminations are demonstrated.

4:30pm – Q&A and Panel Discussion

5:00pm – Day One Closing

5:15pm – 6:15pm - Networking Drinks

Sponsorship Opportunities

Representing your business at the High Voltage Melbourne Conference in 2022 will provide you the opportunity to reach key decision makers from a multitude of industries. For more information on sponsorship and exhibition opportunities please contact:
Emma Cameron at: conferences@idc-online.com or call 1300 138 522

8:30am – Session 8 CASE STUDY

Practical Case Study: Waverley Park 220kV Transmission Linet

Professor Akhtar Kalam - Discipline Group Leader of Electrical Engineering, Victoria University.

This presentation will present on various aspects of the 220 kilovolt (kV) transmission lines crossing the Waverley Park estate in Mulgrave, Victoria. It will evaluate the feasibility of diverting the transmission lines underground. The developer of Waverley Park estate, had originally intended to underground the transmission lines by means of a transition enclosure constructed at each end of the estate and approximately 530 metres of buried cable between the two locations. However, the builder's proposal was ultimately abandoned, and the slightly realigned transmission lines were retained above ground. Included in the formal reasons for abandoning the company's original underground proposal were visual amenity, open space and financial cost concerns. The presentation will identify an alternative, preferred undergrounding solution compared to the original proposal advanced by the builder. Although broadly the same as builder's initially proposed concept, the alternative solution is modelled on the 220 kV Brownhill Road substation located in Auckland, New Zealand. From a public amenities perspective, the Brownhill Road scenario is very similar to that existing on the Waverley Park estate, but is demonstrably superior in terms of visual amenity, open space and financial cost.

9:30am – Session 9 CASE STUDY

Partial Discharge Testing on Rotatory Machines

Vikas Bhandari – Electrical Engineer, Machinemonitor Pty Ltd

This presentation will discuss partial discharge testing as a predictive maintenance tool for stator windings in motors and generators to optimize the sustainability and reliability of ageing HV assets. Vikas will discuss his site work and data analysis experience, which includes; testing techniques on site; failure mechanisms; interpretation of partial discharge testing (PHA, PD Variables, PRPD) and his site experiences in Western Australia.

10:15am – Morning Tea

11:00am – Session 10

Layers of Protection Analysis (LOPA) – ElectraNet Case Study

Nikunj Patel – Senior Electrical Engineer

Ash Minhas – Packaged Works Supervisor

This talk with discuss a Layers of Protection Analysis (LOPA) project that undertook refurbishment works at ElectraNet's sites to provide increased safety for the operation of 900+ disconnectors and Earth switches of more than 20 models ranging from new to over fifty years of service. LOPA improved the mechanical lock-off, signage, drive system reliability as well as a standardised motor supply isolator. Andrew will cover the design of the specialised & unique solution utilising 3D & LiDAR technology that was prototyped, tested & manufactured locally. It is currently in-service across 700+ equipment across ElectraNet's Substations. The solution implemented follows similar operating principle which allows increased protection, safer operation, and maintenance.

11:45am – Session 11

Analysis of Earthing Grids in Multilayer Soils at High Frequencies

Jayson Patrick - Technical Director, Electrotechnik

Modelling earthing system behaviour during both power frequency fault conditions and at high frequencies, especially related to lightning phenomena, is of interest to earthing system designers. The behaviour of earthing systems at varying frequencies is quite different and this paper will present details of the algorithm developed and results in the form of a parametric analysis for multiple grids in different soil conditions for high frequencies.

12:30pm – Lunch

1:30pm – Session 12

Implementing partial discharge testing & monitoring technology: Real world case studies

Jamie Howarth – HVPD Australia General Manager

Operational excellence through the systematic recognition of High Voltage (HV) assets in poor condition, localising the root cause, taking remedial action and efficiently returning them to service in order to avoid costly unplanned outages is a primary focus for many operators across Western Australia (WA). Increasingly common is the implementation of Condition Based Maintenance (CBM) regimes and more specifically, the use of the latest On-Line Partial Discharge technology, providing an early warning indicator of insulation degradation in critical HV assets. The speaker presents solutions for this technology through real world case studies in various industries across WA.

2:30pm – Afternoon Tea

3:00pm – Session 13 AFTERNOON WORKSHOP

Earthing obligations under AS2067 have changed: What has changed, why, and what do you need to do next

Stephen Palmer - Managing Director at Safearth

The much-anticipated revision to AS 2067 was published in September 2016. This standard is the primary standard for HV earthing system design and earthing system management and it includes significant changes, particularly the development of more transparent and site-specific risk-based safety criteria, enabling more effective assessment and management of earthing-related risk. This workshop will review the key understanding, principles and issues foundational to earthing, present the AS 2067 requirements and recommendations, explain the reasoning behind the changes, and provide guidance on how asset owners, designers, testers and inspectors should seek to maximise their compliance and derived benefits. It will also examine how these changes are being seen internationally and what may come with future changes to IEC 61936 and AS 2067. This half day workshop will include explanation of case studies and the opportunity to present and discuss attendees' own cases.

About the Workshop Presenter

Stephen Palmer is Managing Director of Safearth. He is an internationally recognised earthing specialist, with expertise in all areas related to earthing, including design, testing and investigation in sectors including power generation and delivery, heavy industry, mining and rail. For over 20 years Stephen has investigated and managed the risks associated with earthing, lightning protection and interference. As the leader of an international team of 40 consultants & researchers, his experience extends well beyond the technical aspects of the field. He has been a contributing member on the committees responsible for Australian documents including EG-0, AS/NZS 3007 and AS 2067. He is a committee member for IEEE Std80, Std81, Std 837, Std 998, Std 1268 & Std 1246. He is the Convenor of the international CIGRE Working Group B3.54 on earthing system testing and was the secretary of the CIGRE & CIRED Joint Working Group B3.35, which published TB 749 on substation earthing design optimisation including quantified risk analysis. Stephen has delivered formal earthing training for more than a decade and has presented at numerous Australian and international conferences including for the NSW Government, Energy Networks Association (ENA), Engineers Australia, CIGRE, CIRED and the IEEE.

4:30pm – Closing

About the Keynote Presenters

Stephen Palmer

Stephen Palmer is Director of Safearth, Australia's leading earthing specialists. Stephen has expertise in all areas related to earthing, including design, audit and test in sectors including power generation and delivery, heavy industry, mining and rail. For over 20 years Stephen has investigated and managed the risks associated with earthing, lightning protection and interference. As the leader of an international team of 40 consultants & researchers, his experience extends well beyond his personal practice. He has been a contributing member on the committees responsible for Australian documents including EG-0, AS/NZS 3007 and AS 2067. He is a committee member for IEEE Std80, Std81 and Std998. He is Convenor of the International CIGRE Working Group B3.54 on earthing system testing and was the secretary of the CIGRE & CIRED Joint Working Group B3.35, which has published TB 749 on substation earthing design optimisation including quantified risk. Stephen has delivered formal earthing training for more than a decade and has presented at numerous Australian and international conferences including for the NSW Government, Energy Networks Association (ENA), Engineers Australia, CIRED, CIGRE and the IEEE.

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General Information

Confirmation Details

A confirmation email and invoice will be sent to delegates within 3 days of receiving the registration.

Cancellation Policy

A 20% cancellation fee will apply for cancellations received 7–14 days prior to the start date of the conference. Cancellations received less than 7 days prior to the start date of the conference are not refundable, however substitutes are welcome.

Venue

Crowne Plaza Melbourne
1-5 Spencer Street, Melbourne VIC 3008
Phone: (03) 9648 2777

Accommodation

The conference venue has accommodation available. Please book through their reservations team on (03) 9648 2777.

Food and Beverages

All lunches, morning and afternoon refreshments are included in your delegate registration.

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.

Registration Form

To register, simply complete the registration form below and submit via email to conferences@idc-online.com or you can register online at www.events.idc-online.com/upcoming-conferences/

01 Delegate Details

Contact: ..... Company Name: .....

Company Address: .....

Suburb: ..... State: ..... Postcode: ..... Phone: .....

Admin/Accounts Payable Email: .....

Attendees

1: ☐ Mr ☐ Mrs ☐ Ms Name: ..... Job Title: .....

Email: .....

2: ☐ Mr ☐ Mrs ☐ Ms Name: ..... Job Title: .....

Email: .....

3: ☐ Mr ☐ Mrs ☐ Ms Name: ..... Job Title: .....

Email: .....

4: ☐ Mr ☐ Mrs ☐ Ms Name: ..... Job Title: .....

Email: .....

02 How Did You Hear About This Event?

☐ Received a brochure in the mail ☐ Received an email from IDC

☐ Searched online (Google, Yahoo etc) ☐ Recommended by a friend/colleague ☐ Magazine advertisement/insert

☐ Other (please specify): .....

03 Registration & Payment Details **(NB: prices shown are inclusive of GST)**

Total

☐ OPTION 1: **Early Bird Discount** 10% OFF – Book on or before 15th August (Save $100)

$900 x ..... delegates = $ ..... $ .....

☐ OPTION 2: **Standard Rate** (No Early Bird) – Book after 15th August

$1,000 x ..... delegates = $ ..... $ .....

☐ OPTION 3: **3 for 2 Offer & Early Bird** 10% OFF – Book on or before 15th August (Save $900)

3 x delegates = 2 x $900 = $1,800 $ .....

☐ OPTION 4: **3 for 2 Offer Standard Rate** (No Early Bird) – Book after 15th August (Save $1,000)

3 x delegates = 2 x $1,000 = $2,000 $ .....

Additional delegates? Corporate packages available upon request. **Total Due $** .....

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

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