cigre New Zealand

2024 Conference

November 19-21

Tāmaki Makaurau Auckland

Building New Zealand's Future Power System

cigre For power system expertise

Venue

Old Government House
24 Princes Street, Auckland CBD

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ACKNOWLEDGMENTS

As the Conference Chair, I would like to express my heartfelt gratitude, on behalf of the CIGRE New Zealand National Committee (NZNC), to all the hosts and sponsors who have generously supported the CIGRE NZ 2024 Conference.

We also extend our sincere thanks to the organisations, individuals, and volunteers whose contributions have been integral to the success of this event. We acknowledge Te Waipapa Taumata Rau / University of Auckland (Electrical, Computer and Software Engineering Department), QuakeCore, Vector, and IEEE PES for their valuable support through venue koha, site visit, volunteers, food and other sponsorship, which have made it possible for industry professionals and individuals to join, share, learn, and collaborate throughout the three intensive days of the conference at minimal costs.

A special mention goes to Dr. Nirmal Nair, whose local support, advocacy, and efforts in securing sponsorship have been pivotal in bringing the CIGRE NZ 2024 Conference to life at the University of Auckland. Thank you for your dedication and commitment to making this event a reality.

Thank you

Abhinav Chopra
CIGRE NZ 2024 Conference Chair
021 199 0 34 V
www.cigre.org.nz

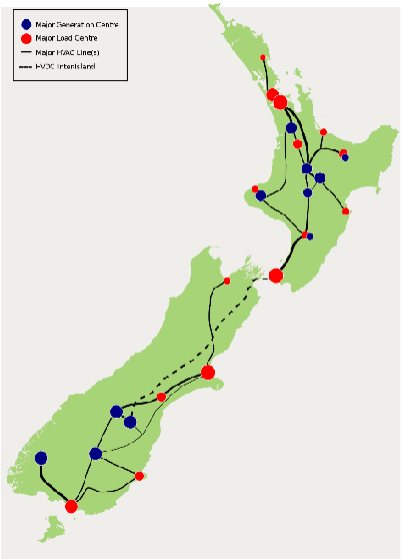
ABOUT CIGRE

CIGRE is a permanent, non-governmental and non-profit international association.

Based in France, CIGRE was founded in 1921. CIGRE is an international organization dedicated to the development of the power supply sector through the identification and the development of solutions to industry issues. With members in more than 80 countries, it is the leading worldwide organization on Electric Power Systems, covering their technical, economic, environmental, operational, organizational, and regulatory aspects.

CIGRE counts more than 3,500 experts from all around the world working actively together in structured work programmes coordinated by the CIGRE 16 Study Committees, overseen by the Technical Council. Their main objectives are to design and deploy the end-to-end power system for the future, optimize existing equipment and power systems, respect the environment, and facilitate access to information.

CIGRE NEW ZEALAND NATIONAL COMMITTEE



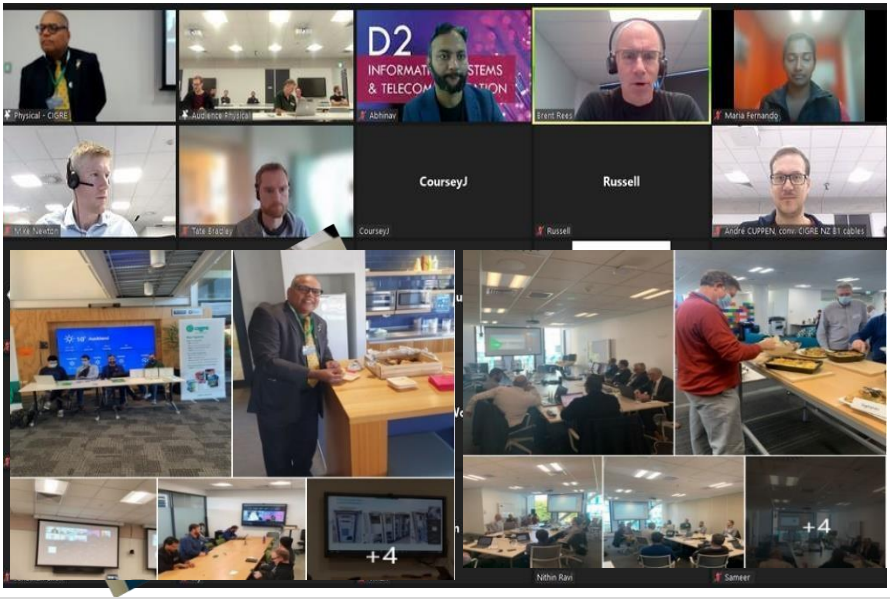
The New Zealand National Committee (NZNC) was accepted as a full CIGRE National Committee by the CIGRE Administrative Council at its meeting held during the 2006 Paris Session. Since then, we have been active nationally and internationally through engagements of:

- Disseminate CIGRE information and maintain communication with local NZ members regularly
- Provide a platform for presenting NZ expertise and experience to the New Zealand and International power systems community
- Active point of contact for CIGRE Paris, the ANC and other National Committees
- Take our place on the world stage at CIGRE Paris with the other CIGRE National Committees
- Invitations and hosts to CIGRE Study Committees to hold meetings in NZ
- Participate as a member of the Asia Oceania Regional Council (AORC) of CIGRE
- Participating in, and providing internationally recognised keynote speakers for EEA2018, EEA2019, EEA2020, EEA 2021, EEA 2022 annual conferences
- Arranged and hosted Regional/Global Conferences and Symposia such as CIGRE Auckland Symposium 2013, B5 Colloquium 2017, AORC 2017, Administrative Council Meeting 2017, and CIGRE ANZ 2018 in conjunction with AUPEC 2018, CIGRE NZ Conference 2020, 2021, 2022.

CIGRE NZ NATIONAL COMMITTEE (NZNC) COMPOSITION

Member	Position	Organisation
Waqar Qureshi	Chair	Wellington Electricity
Doug Ray	Immediate Past Chair	Vector
Dr Nirmal Nair	Technical Chair/ AORC	University of Auckland
André Cuppen	Executive Member	PowerCo
Brent Rees	Executive Member	Hitachi Energy
Trevor Lord	Executive Member	Individual
Rebecca Marx	Membership Manager	Mitton ElectroNet
Vaughan Evans	Publicity Chair	Individual
Soren Subritzky	Next Generation Network Chair	University of Canterbury
Leonie Bule	Women in Energy Chair	University of Auckland

Abhinav Chopra	CIGRE Conference Chair 2024	ARHA.nz

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INTRODUCTION FROM CONFERENCE CHAIR

Kia ora koutou katoa

On behalf of the CIGRE NZNC Conference Committee, our Executive, and all our members, I am delighted to welcome you to the **CIGRE NZNC Annual Conference 2024**.

This year's event promises to be a unique and insightful gathering of experts, professionals, and key stakeholders from across New Zealand's power system industry.

Our focus for 2024 is on a **deep dive into building New Zealand's Future Power Systems** as the landscape of New these are evolving and adapting to meet emerging challenges and new opportunities.

The conference program is designed to provide a dynamic and engaging experience, featuring the **CIGRE NZNC Annual Forum**. These sessions will cover a range of critical topics, offering insights into both the technical and strategic dimensions of our industry. One of the key highlights will be a **case study** on the **June 2024 transmission tower collapse**, providing valuable lessons on the resilience complexities our interrelated systems face. We will also be hosting a variety of **industry-led technical presentations**, giving you the latest updates on trends and developments across the sector.

In addition, we are excited to offer a deeper technical engineering exposé on **Insulated Cables** on **Days 2 and 3**, with an in-depth exploration of these, showcasing how CIGRE NZ's members have engaged with CIGRE international plus local practitioners and professionals' expertise since our NZNC formation in 2006. These sessions are designed to provide actionable knowledge for power system engineers, consultants, generation, transmission, and distribution owners, system operators,

policymakers, and researchers.

A special feature of the 2024 conference is our **exclusive in person format**, aimed at fostering deeper engagement and meaningful collaboration. This approach will allow us to exchange ideas, share strategies, and strengthen New Zealand's position within the global energy landscape, both now and in the future.

I am also proud to highlight the contributions of our **Next Generation Network (under 35)** and **Women in Engineering** members, whose fresh perspectives and innovative ideas will drive forward-thinking discussions on the future of New Zealand's power systems. Their participation ensures that we remain at the cutting edge of innovation and leadership in the sector.

As we continue to build the energy systems of tomorrow, the importance of collaboration and knowledge-sharing has never been greater. This conference is a platform for just that—a space where we can come together to shape the future of New Zealand's power systems and ensure we are well-prepared to meet the challenges ahead.

I am truly excited for the discussions and insights that will emerge over the course of this conference, and I look forward to your active participation.

Welcome once again, and I hope you enjoy the event.

Abhinav Chopra

Chair for CIGRE NZNC Annual Conference 2024

Vice-Chair, CIGRE NZNC

CONFERENCE COMMITTEE

The world needs dreamers and the world needs doers. But above all, the world needs dreamers who do. Thanks to our organisational team below:

Abhinav Chopra, A.R.H.A	Conference Chair D2 Convenor Vice Chair CIGRE NZNC	
Nirmal Nair, UoA	Technical Chair/AORC C5 Convenor	
Waqar Qureshi, Wellington Electricity	CIGRE NZNC Chair	
Doug Ray, Vector	Conference Finance Chair Conference Co-chair	
Abdullah Yusuf, UoA	Conference Delivery and Publicity Director	
Leonie Bule	Pacific and Women in Energy Chair	
Dylan, PSC	Industry Liaison Director	
Basil Baby	Local Logistics Chair	
Yuan Liu, UoA	Selection & Administration Committee Chair	
Shaila Arif UoA	Conferencing Director	

WELCOME FROM CONFERENCE TECHNICAL CHAIR

Kia ora koutou,

It is my pleasure to welcome you to the **CIGRE NZNC Annual Conference 2024** as Technical Chair. Since our founding in 2007, CIGRE NZNC has grown significantly, now featuring **nine active panels** representing the 16 CIGRE Study Committees. These panels, launched over the past few years, play a key role in driving technical discussions, workshops, and knowledge-sharing events within New Zealand's power system community.

This year, our focus is on the **reviewing the readiness** of building up New Zealand's power system network of 2050. In the face of increasing challenges around workforce recruitment, training, and development, the conference aims to provide valuable learning opportunities and networking for our diverse industry members. The program is designed to offer insights from local and international experts, addressing critical issues in power systems and supporting **life-long learning** for all participants.

With this fourth edition of our conference, held in partnership with **Vector Limited** at an urban center, we look forward to fostering meaningful technical discussions and collaborations. Despite several power industry events this year, we have created an engaging and comprehensive event that reflects the continued maturity of CIGRE NZNC.

I trust you will enjoy this year's conference and the opportunity to connect with industry leaders.

Nga mihi, and thank you for being with us.

Nirmal Nair
Technical Chair, CIGRE NZNC

TECHNICAL STUDY COMMITTEE STRUCTURE

The 16 international CIGRE Study Committees are mirrored as NZNC Panels within CIGRE NZ.

Mirror Panel	CIGRE Study Committee	Conveners
NZ.B1	Insulated Cables	**André Cuppen**
NZ.B2	Overhead Lines	**Helen Gilbert**
NZ.B3	Substations and Electrical Installations	**Doug Ray**
NZ.B4	DC Systems and Power Electronics	**DC**
NZ.B5	Protection and Automation	**Stephen Chiu**
NZ.C5	Electricity Markets and Regulation	**Nirmal Nair**
NZ.A2	Power Transformers and Reactors	**Dan Martin**
NZ.D1	Materials and Emerging Test Techniques	**Andrew Lapthorn**
NZ.D2	Information Systems and Telecommunications	**Abhinav Chopra**

WELCOME FROM CIGRE NZ Chair

Kia ora koutou katoa,

On behalf of the **CIGRE** global community, it is my great honour to welcome you to the **CIGRE NZNC Annual Conference 2024**.

This year's theme, **"Deep Dive into Building New Zealand's Future Power Systems,"** aligns perfectly with our collective mission to drive the transition towards more sustainable, resilient, and innovative power systems worldwide.

As the global voice of power systems, CIGRE plays a pivotal role in shaping the future of energy. With the participation of experts from over 90 countries, CIGRE provides a unique platform for sharing knowledge, fostering collaboration, and advancing technical expertise across the energy sector. Our strength lies in the diverse perspectives and collective intelligence of our members, who span all corners of the globe, working together to tackle the most pressing challenges facing our industry.

CIGRE New Zealand has been an integral part of this global network since its inception in 2006, and it is incredibly inspiring to see the leadership it continues to provide in the Pacific region. This year's conference, hosted in partnership with the **University of Auckland**, is a testament to the maturity and growth of CIGRE NZNC. It reflects our shared commitment to fostering professional development, supporting knowledge exchange, and building the power systems of the future.

We are living in a time of unprecedented transformation in the power sector. With the accelerating demands of decarbonization, digitalization, and decentralization, the role of power systems professionals has never been more important. This conference is an excellent opportunity to engage with the thought leaders, experts, and innovators who are shaping the future of energy. It is a chance to collaborate, learn, and be

inspired by new ideas, cutting-edge solutions, and the exciting possibilities that lie ahead.

I would like to extend my sincere thanks to the **CIGRE New Zealand team**, the **conference organisers**, the speakers, and all of the participants for making this event a reality. Your commitment to advancing the future of power systems is what drives our global mission forward. I am confident that the discussions, connections, and insights shared at this conference will play a crucial role in advancing New Zealand's energy future.

Thank you for your participation, and I hope you enjoy this exceptional gathering of minds.

Nāku iti noa, nā

Waqar Qureshi

Chair, CIGRE NZNC

WELCOME FROM CONFERENCE CO-CHAIR
CONFERENCE FINANCE CHAIR
CIGRE NZNC IPC CHAIR

Kia ora koutou katoa

On behalf of CIGRE NZ; welcome to CIGRE NZ 2024 Conference and its focus on "**Building New Zealand's Future Power Systems** "

Thank you to the University of Auckland for your invitation to us within your place of learning in Tāmaki Makaurau. Ther koha of your people and venue is outstanding. We are likewise indebted to all our sponsors present at the conference for your own generosity for us.

Thank you to our University of Auckland conference organising committee, establishing a cohesive program for an informative, collegiate conference experience.

We believe our new energy power systems' future is the critical agent for successful sustainable communities we live and work within.

Our motivation is to bring together local and international cross-sector people to share their experience of how technology, practices, and partnerships can benefit equitable energy access and resilience of power supply that benefits our community's wellbeing and prosperity.

We wish you well for the conference and thank you for your contribution.

Ngā mihi nui

Doug Ray

IPC, CIGRE NZNC

PROGRAMME

Time	Tuesday 19th November		Wednesday 20th November		Thursday 21st November
8:30-9:30	Vector Substation Visit	8:30-9:30	Digital Substation and Instrusion Detection Panel Discussion Facilitated by CIGRE NZB5, NZB3 and NZD2 Panel Conveners	8:30-8:45	NZB1 Panel Presentations: NZB1 Background - Andre Cuppen Summary of CIGRE Paris B1 session to NZB1 - Andre Cuppen RAG updates - Andrew Wooles Feedback from national working group (NWG NZB1.003 - Cable testing) - Mo Al-Hasani link to detailed program on KMS: https://cigregroups.org/x/yYIKEw
9:30-10:00	Harnessing Disruptive Technologies for Seismic Resilience Pre-Workshop Facilitated by QuakeCore	9:30-10:00		8:45-9:00	
10:00-10:30		10:00-10:30		9:00-9:15	
10:30-11:00		10:30-11:00	Break	9:15-9:30	
11:30-12:00		11:30-12:00	Case Study: Northland outage 20 June2024 - Resilience or Reliabiliy? Nirmal Nair	10:00-10:15	Break
12:00-12:30	Conference Registration	12:00-12:45		10:15-10:30	Technical presentations by NZB1 members "MV cable quality" - Dheshni Pillay "Updates on cable manufacturing trends" - Saddat SHAMSUDDIN "The Impact on cables of Transition to Renewables" - Goran Stojadinovic "Update on the latest cable testing trends" - Gary Caitlin or Pengwei "Update on MV accessory trends" - Andrew Wooles "Summary of TB825 and TB883 with focus on maintenance of cables" - Mohanad Al-Hasani "MV cable arc model to develop robust protection" - Andre Cuppen
12:30 - 13:00		12:45 - 13:15	Break for lunch	10:30-11:00	
13:00-14:00	Mihi Whakatu/ Conference Opening	13:15-13:30	Common Technical Session: Progress on the LV pillar fires research in the NZ industry - panel discussion Technical presentations - LV insulation coordination in public electrical network distribution assemblies (PENDA) - Goran STOJADINOVIC - LV pillar fire research into failure modes - André CUPPEN - distribution LV pillar fires: internal inspections, historical data, failure modes, mitigating factors, future LV monitoring - Dheshni PILLAY - Monitoring technologies LV - TBD	11:00-11:30	
	Opening Address by Conference chair, Technical chair	13:30-14:00		11:30-12:00	
	Keynote speaker: Jeff Schlichting, Helios	14:00-14:30		12:00-12:30	
14:00-15:00	Innovation and Testing IEEE 400 Omnibus Standard - Pengwei, HV Diagnostix Innovative Thermal Resistant Aluminium Alloy Conductor - James Raea, ECS	14:30-15:00		12:30-13:00	Break
				13:00-14:00	NZB1 Panel Annual General Meeting (by invitation) (with break at about 14:00 - 14:15)
15:00 - 15:15	Break	15:00 - 15:15	Break for afternoon tea	14:00 - 14:10	
15:15 - 17:15	5G and AI applications in power systems: Abhinav, ARHA Market Regulations Audience Discussion Facilitated by CIGRE NZC5 and NZC6 Panel Conveners: Nirmal Nair, UoA	15:15 - 16:00	Discussion with time for questions and input from attendees - response from EDBs incl case studies - suppliers Call for national working group (volunteers for leading and membership) - Andre Cuppen Facilitated by Goran Stojadinovic	14:10-15:00	
17:15-17:30	Break	17:15-18:00	End of Conference		End of Panel
17:30-19:00	Conference Dinner				

CIGRE NZ 2024 CONFERENCE DAY 1

Building New Zealand's Future Power System

Tuesday 19 November

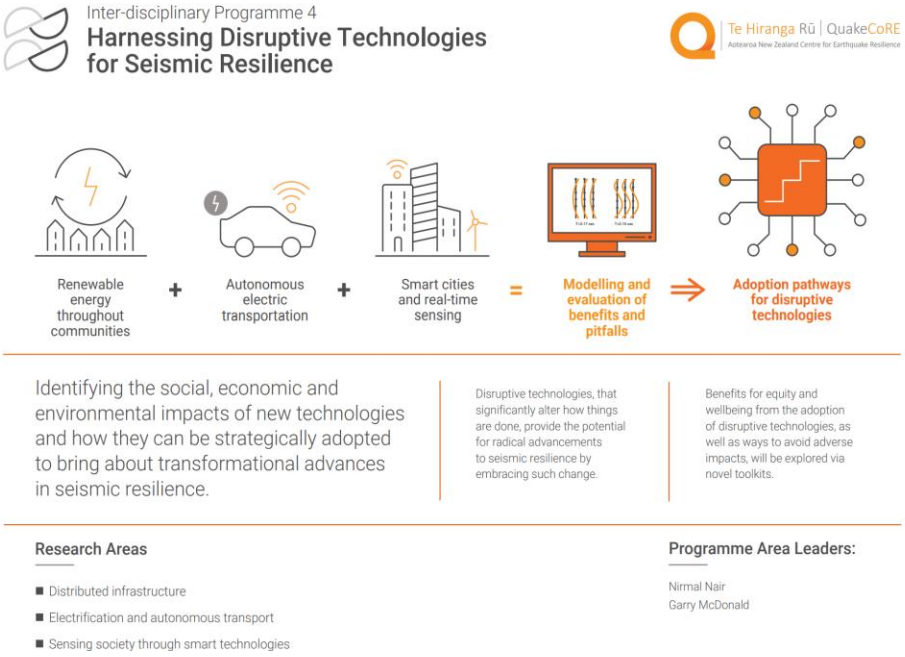
Vector Substation Visit

Hobson Street Substation, initially built to power Auckland's early tram system, now serves as a critical component in upgrading Auckland's 220 kV grid to meet rising power demand. Located near Auckland's CBD, the site integrates Vector's Penrose to Hobson Street Tunnel to reinforce power supply. The 3450 m^2 site accommodates substation buildings, including advanced 220/110 kV GIS plants and transformers. Key design features focused on safety, operability, and long-term maintainability, while also addressing fire protection and environmental considerations.

Pre-conference Workshop
Harnessing Disruptive Technologies for Seismic Resilience

Dr Garry McDonald
QuakeCore IP4 Co-Leader
Market Economics

Dr Nirmal Nair
QuakeCore IP4 Co-Leader
University of Auckland



This inter-disciplinary Programme focuses on three exemplary strands of disruptive infrastructure technologies under a range of plausible forward-looking scenarios to 2030, 2040 and 2050. We will investigate how these

technologies may be harnessed to maximise not only economic objectives, but also to create seismic resilience co-benefits while minimising societal and environmental costs associated with increased inter-connectedness, 'lock-in' path dependencies and inequitable distributional impacts. Through these case studies we will develop novel integrated dynamic models, which sit at the convergence of data and system science, widening the investment evaluation lens to capture economic and wellbeing indicators through time for multiple stakeholders.

For more details visit https://quakecore.nz/research-qc2/ip4/

PRESENTERS:

Dr Robert Cardwell
Researcher
Market Economics Ltd

Dr Ho Seok Ahn
Senior Research Fellow
University of Auckland

Paul Drummond
Industry Affiliate
QuakeCore

Dr Yuan Liu
Research Fellow
University of Auckland

Shaila Arif
Doctoral Candidate
University of Auckland

Rahul Chopra
Doctoral Candidate
University of Auckland

Masood Ur Rehman
Doctoral Candidate
University of Auckland

CONFERENCE OPENING

Abhinav Chopra (CEng, PhD, MBA),

Vice Chair - CIGRE NZNC, Conference Chair

Abhinav leads the Future and Advanced Power and Computer Systems Architecture/Design, audit, overseeing a diverse portfolio that includes Space Power Systems, Smart Grid Architecture, Substation Automation, Power Systems Integration, Communication Systems, OT and ICS Systems, DERMS, ADMS, GIS, Asset Management, AI, Big Data, Blockchain, Distributed Systems, Cloud, Cyber Security, RTU, PIU and IIoT. He has contributed to the development of industry standards (ISO/IEC/IEEE) and offers consulting services to critical infrastructure sectors. Currently, Abhinav serves as the COO and Principal Consultant at Autonomous Real-Time High-Tech Applications (A.R.H.A) Ltd. His expertise spans a wide range of domains and contributes to ISO IWA 39, ISA99, NIST, IEC 62443, CIGRE D2 and C6, and emerging technologies such as AI LLM, IoT and IED.

Doug Ray

IPC - CIGRE NZNC

Doug is the immediate past Chair of CIGRE NZ (2018-2022), is a CIGRE SC B3 observer member, inaugural convenor of the CIGRE NZ SC B3 mirror Panel and a CIGRE Australia SC B3 mirror Panel contributing representative (2000-).

For CIGRE NZ he has co-led Colloquium Special Reporter sessions and contributions at Paris Sessions. Doug has 40+ years of end-to-end power systems multi-disciplinary experience. His role within Vector is electricity substations asset and resilience performance. He has led Vectors power systems project management and engineering teams. As a senior consultant for Parsons Brinkerhoff, he won and delivered fast-track engineering projects. Doug also contributes to the NZ Construction Clients Group (2001-) and is their Safety in Design chair.

Dr. Nirmal Nair

Technical Chair – CIGRE NZNC

Nirmal works with the industry to develop proof of value and proof of concepts, to make research practicable, providing cutting edge products that extend the offerings of the New Zealand and International Businesses. He received his BE in Electrical Engineering from Maharaja Sayajirao University (M.S.U), Baroda, India. Nirmal then completed his ME in Electrical Engineering with specialization in High Voltage Engineering from Indian Institute of Science (IISc), Bangalore, India. After a decade of professional engineering and lecturing in India he moved to United States where he completed his PhD in Electrical Engineering at Texas A&M University. Since 2004 he has been based in New Zealand.

KEYNOTE SPEAKER

Jeff Schlichting

Founder & Managing Director, Helios Energy Limited

Jeff Schlichting, an Edmund Hillary Fellow, grew up in rural Kansas where he experienced the endless power of wind and sun while learning the value of hard work.

Jeff started in the renewable energy business in 1988, before it was considered a 'thing' and was involved in some of the earliest projects to utilise renewable and alternative technologies. Since then, Jeff has led the successful development of numerous renewable energy projects.

In late 2019, Jeff and his business partner recognised the need for grid-scale PV solar in Aotearoa New Zealand. Shortly thereafter, they founded Helios Energy Limited with the vision of enabling and accelerating a zero-carbon future for the country while providing greater access to low-cost clean energy.

Jeff enjoys being on the land, visiting project sites, engaging with landowners, mana whenua and the local communities. Outside of work, you'll find him looking for adventure and exploring his adopted home, from Cape Reinga to Rakiura.

Updates to the IEEE 400 Omnibus Standard Focusing on trends in cable testing

Pengwei Liu
Test and Sales Manager, HVdiagnostix

Pengwei Liu has dedicated his career to advancing the field of medium voltage cable testing and diagnostics, bringing deep technical expertise developed over 15 years in the power equipment industry.

Starting as a specialist in high-voltage systems, Pengwei has built comprehensive experience in ensuring the reliability and safety of high voltage power equipment.

Through his role at HVdiagnostix, Pengwei leads hands-on testing initiatives and provides specialized training. His work encompasses technical consultation, diagnostic implementation with machine vision, deep learning and machine learning techniques for both cable and switchgear, and the development of customized testing method that help clients optimize their power system maintenance programs.

Pengwei holds two master's degrees in electrical engineering and is a certified Project Management Professional (PMP).

Beyond his professional duties, he maintains an active presence in the power systems community, regularly participating in industry forums and technical discussions to advance testing methodologies and diagnostic practices that enhance grid reliability.

"New Conductor Materials: Innovative Thermal Resistant Aluminium Alloy Conductor"

James Raers
Chief Executive Officer
Effective Climate Solutions (ECS)

James Raea B-Com is the Chief Executive of Effective Climate Solutions (ECS). ECS specialise in Modular Climate Tech/Solutions to enable communities to adapt to climate changes. The focus of the company energy strategy centres around 3 core aspects - efficiency, augmentation and storage.

Energy sector has seen increased demands for electricity infrastructure, owing to climate changes affecting the ability of existing energy generation methods to meet the needs of the community in providing a reliable energy network and meet climate goals. He is here today to talk about efficient transmission of energy using next generation transmission wires as part of the renewable energy transition.

MARKET REGULATION AND DISTRIBUTION TECHNOLOGY

5G and AI Technology

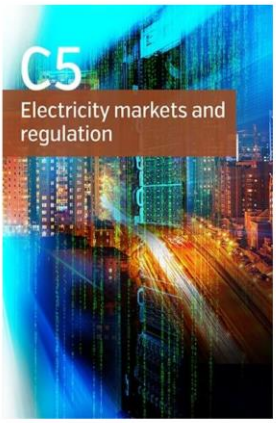
Abhinav Chopra (CEng, PhD, MBA),
A.R.H.A

Abhinav leads the Future and Advanced Power and Computer Systems Architecture/Design, audit, overseeing a diverse portfolio that includes Space Power Systems, Smart Grid Architecture, Substation Automation, Power Systems Integration, Communication Systems, OT and ICS Systems, DERMS, ADMS, GIS, Asset Management, AI, Big Data, Blockchain, Distributed Systems, Cloud, Cyber Security, RTU, PIU and IIoT. He has contributed to the development of industry standards (ISO/IEC/IEEE) and offers consulting services to critical infrastructure sectors. Currently, Abhinav serves as the COO and Principal Consultant at Autonomous Real-Time High-Tech Applications (A.R.H.A) Ltd. His expertise spans a wide range of domains and contributes to ISO IWA 39, ISA99, NIST, IEC 62443, CIGRE D2 and C6, and emerging technologies such as AI LLM, IoT and IED.

An exploration of electricity markets and regulation in New Zealand. Are they fit for the growth and integration of distribution technologies?

C5 - Electricity markets and regulation

A- A+



Mission

Study Committee C5 bridges the gap between engineering, economics and regulation. It analyses the impacts of different approaches to markets, regulation and differing market structures (Institutions, participants and stakeholders) on the planning, operation and regulation of electric power systems. Examining the role of competition and regulation in the electricity industry is important for the orderly transition of the power system as well as improvements to its end-to-end efficiency.

Current activities of the Study Committee

Changes in regulatory roles and jurisdictional regulation related to the interaction between the transmission system and the distribution system.

The role of markets and regulation regarding:

- the integration and coordination of distributed energy resources and new technologies;
- wholesale market price formation, including emissions pricing and the impact of non-wholesale market participants;
- sector integration between gas (including renewable gases) and electricity;
- validation of low emission technologies;
- The impact of emerging technologies on market (and system) operations;
- Market clearing procedures, techniques and principles used to take advantage of the flexibility of aggregating large numbers of end-users;
- Potential Market rule changes to address changes in traditional ancillary service products to cater for the changes in the supply and demand for electricity;
- Generation and demand flexibility to manage intermittent supply;
- incentivising system strength and inertia in energy systems.

Dr. Nirmal Nair

University of Auckland

Nirmal works with the industry to develop proof of value and proof of concepts, to make research practicable, providing cutting edge products that extend the offerings of the New Zealand and International Businesses.

He received his BE in Electrical Engineering from Maharaja Sayajirao University (M.S.U), Baroda, India. Nirmal then completed his ME in Electrical Engineering with specialization in High Voltage Engineering from Indian Institute of Science (IISc), Bangalore, India. After a decade of professional engineering and lecturing in India he moved to United States where he completed his PhD in Electrical Engineering at Texas A&M University. Since 2004 he has been based in New Zealand.

CIGRE NZ 2024 CONFERENCE DAY 2

Building New Zealand's Future Power System

Wednesday 20 November

DIGITAL SUBSTATIONS and Operational Tech

A presentation on newer types of digital substation, Auckland Model for logical Airgaps and Intrusion detection by Greg, Abhinav and Dylan

Greg Sherlock Miles

Asset & Resilience Manager - Protection & Operational Technology, Vector

Greg is the Asset and Resilience Manager for Protection and Operational Technology at Vector Limited. Managing operations, maintenance, design, asset management and strategy for protection, automation, control and communications equipment and systems across the Vector network. 20+ years of electrical, control systems, operational technology and data analytics experience across Defence, mining, oil and gas, water and power industries

Abhinav Chopra (CEng, PhD, MBA), A.R.H.A

Abhinav leads the Future and Advanced Power and Computer Systems Architecture/Design, audit, overseeing a diverse portfolio that includes Space Power Systems, Smart Grid Architecture, Substation Automation, Power Systems Integration, Communication Systems, OT and ICS Systems, DERMS, ADMS, GIS, Asset Management, AI, Big Data, Blockchain, Distributed Systems, Cloud, Cyber Security, RTU, PIU and IIoT. He has contributed to the development of industry standards (ISO/IEC/IEEE) and offers consulting services to critical infrastructure sectors. Currently, Abhinav serves as the COO and Principal Consultant at Autonomous Real-Time High-Tech Applications (A.R.H.A) Ltd. His expertise spans a wide range of domains and contributes to ISO IWA 39, ISA99, NIST, IEC 62443, CIGRE D2 and C6, and emerging technologies such as AI LLM, IoT and IED.

Dylan Jenkins

Operational Technologies Manager, PSC

Dylan has recently returned to New Zealand following a 12-year adventure working as an engineer and technical manager in the UK, Germany, and the UAE. His most recent role involved leading the technical consulting team responsible for Power Grid Automation at Hitachi Energy in the Middle East region.

Dylan's presentation provides an overview of Operational Technology (OT) cybersecurity measures for substations, focusing on practical approaches to secure critical infrastructure. Drawing on experiences from the Middle East, it covers essential elements of substation cybersecurity, including the implementation of "De-militarised Zones" (DMZs) at substations, Network Intrusion Detection, Next-Generation Firewalls, centralised authentication, secure remote access, and security logging.

Facilitator
Doug Ray

CIGRE NZNC

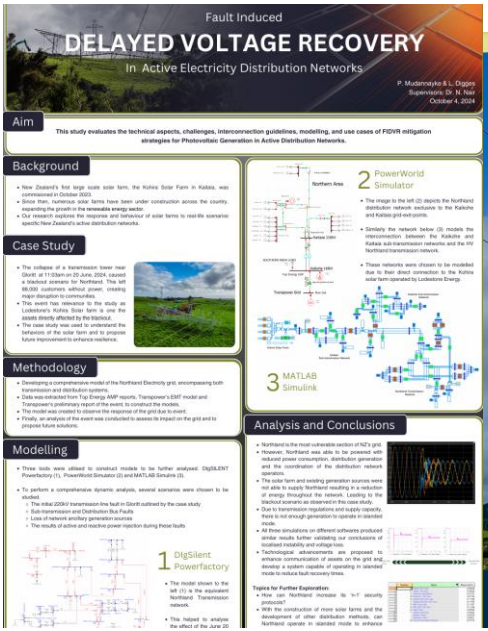
Doug is the immediate past Chair of CIGRE NZ (2018-2022), is a CIGRE SC B3 observer member, inaugural convenor of the CIGRE NZ SC B3 mirror Panel and a CIGRE Australia SC B3 mirror Panel contributing representative (2000-).

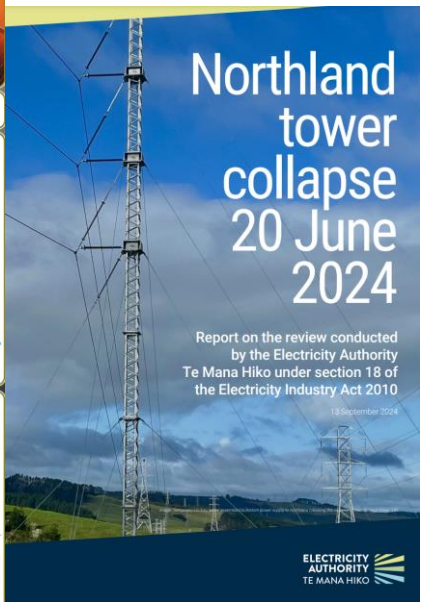
For CIGRE NZ he has co-led Colloquium Special Reporter sessions and contributions at Paris Sessions. Doug has 40+ years of end-to-end power systems multi-disciplinary experience. His role within Vector is electricity substations asset and resilience performance. He has led Vectors power systems project management and engineering teams. As a senior consultant for Parsons Brinkerhoff, he won and delivered fast-track engineering projects. Doug also contributes to the NZ Construction Clients Group (2001-) and is their Safety in Design chair.

CASE STUDY: NORTHLAND OUTAGE JUNE 2024

RESILIENCE OR RELIABILITY?

Technical discussion on resilience and reliability - how to analyse that?





https://www.ea.govt.nz/documents/5707/Electricity_Authority_Report_Northland_tower_collapse_20_June_2024.pdf

Dr. Nirmal Nair
University of Auckland

Nirmal works with the industry to develop Proof of Value and proof of concepts, to make research practicable, providing cutting edge products that extend the offerings of the New Zealand Businesses. He has received his BE in Electrical Engineering from Maharaja Sayajirao University (M.S.U), Baroda, India. He completed his ME in Electrical Engineering with specialization in High Voltage Engineering from Indian Institute of Science (IISc), Bangalore, India. After a decade of professional engineering and lecturing in India he moved to United States where he completed his PhD in Electrical Engineering at Texas A&M University. Since 2004 he has been based in New Zealand.

TECHNICAL SESSION: PROGRESS ON THE LV PILLAR FIRES RESEARCH IN THE NZ INDUSTRY

LV INSULATION COORDINATION IN PUBLIC ELECTRICAL NETWORK DISTRIBUTION ASSEMBLES (PENDA)

There are 'hidden' costs of transition to renewables that are usually omitted when planning, installing, and commissioning renewables. Traditional distribution networks are passive e.g. power flow is unidirectional. A high uptake of renewables creates a bi-directional power flow that can cause "blind spots" on feeders, overvoltage's, harmonics, and excessive circulating neutral/ground currents, resulting in various failures. This paper discusses hidden costs and how to mitigate them with practical, cost-effective and affordable measures that are relatively simple to implement. This approach fosters maximising the use of existing resources and equipment and justifies additional investment into proven new technologies and smart solutions.

Goran Stojadinovic
TransNet NZ Limited

Goran Stojadinovic is the Product and Innovation Manager, TransNet NZ.

Previously, Goran was at Northpower for eight years as Innovations & Technologies Manager, fifteen years for Vector as Asset Engineer and Assessor.

In 2013 Goran introduced acoustic inspection of powerlines to Australasia and since developed a wealth of technical knowledge around failure modes and mechanisms of MV/HV powerlines, network design, and predictive maintenance. Goran made many innovations, obtained two patents, presented twenty Conference Papers, eight Industry Papers, and dozens of White Papers and Technical Articles.

Education:

- Master of Commercialisation & Entrepreneurship –University of Auckland
- Master of Electrical Engineering – Belgrade University, Serbia

LV PILLAR FIRE RESEARCH INTO FAILURE MODES

Andre Cuppen
PowerCo, New Zealand

André Cuppen possesses a thorough knowledge of cable asset management, with 15+ years of experience in managing primary assets in electricity distribution and transmission networks in Australia, New Zealand and the Netherlands. Through 5 years of asset management consultancy working for the world leader in power asset consultancy and testing, DNV KEMA (now DNV Energy and previously KEMA),

DISTRIBUTION LV PILLAR FIRES: INTERNAL INSPECTIONS, HISTORICAL DATA, FAILURE MODES, MITIGATING FACTORS, FUTURE LV MONITORING

Distribution Low Voltage pillar fires pose significant risks to network reliability and public safety. Root causes often include insulation failure, corrosion, overheating due to high loads, and mechanical wear. Environmental factors such as moisture ingress and dust accumulation further exacerbate these vulnerabilities. Mitigation strategies focus on regular maintenance, corrosion protection, thermal imaging for hotspots, and installation of temperature sensors. The future of LV monitoring is expected to advance through smart sensors and IoT-enabled predictive maintenance, providing real-time data on load, temperature, and humidity. This proactive approach promises enhanced fault detection, reduced fire incidents, and improved asset lifespan.

Dheshni Pillay
Unison Networks

Dheshni Pillay is an experienced electrical engineer with 16 years in the industry. Currently an Asset Strategy & Constraints Engineer at Unison Networks in Hawkes Bay, New Zealand, Dheshni specializes in optimizing asset

performance by managing asset condition and identifying constraints. Her extensive expertise supports the strategic development of Unison's energy network, ensuring efficiency and resilience across the region.

MONITORING TECHNOLOGIES FOR LV

CALL FOR NATIONAL WORKING GROUPS (VOLUNTEERS FOR LEADING AND MEMBERSHIP)

Andre Cuppen

PowerCo, New Zealand

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CIGRE NZ 2024 CONFERENCE DAY 3

Building New Zealand's Future Power System

Thursday 21 November

NZ.B1 PANEL PRESENTATIONS

NZ.B1 BACKGROUND

Andre Cuppen

PowerCo, New Zealand

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Through 5 years of asset management consultancy working for the world leader in power asset consultancy and testing, DNV KEMA (now DNV Energy and previously KEMA)

RAG UPDATES

Andrew Wooles

Technical Manager – Cable Accessories,
TransNet NZ Limited

Andrew has worked in the Electrical industry for 44 years, starting as an apprentice cable jointer in 1980.

Andrew has held various power systems positions in the UK and moved to NZ in 2006 working on sub-transmission cables and has been in a technical / training role for the last 12 years for jointing products and practices.

FEEDBACK FROM NATIONAL WORKING GROUP (NWG NZB1.003 – CABLE TESTING)

TECHNICAL PRESENTATIONS BY NZ.B1 MEMBERS

MV CABLE QUALITY

Dheshni Pillay
Unison Networks

Dheshni Pillay is an experienced electrical engineer with 16 years in the industry. Currently an Asset Strategy & Constraints Engineer at Unison Networks in Hawkes Bay, New Zealand, Dheshni specializes in optimizing asset performance by managing asset condition and identifying constraints. Her extensive expertise supports the strategic development of Unison's energy network, ensuring efficiency and resilience across the region.

UPDATES ON CABLE MANUFACTURING TRENDS

THE IMPACT ON CABLES OF TRANSITION TO RENEWABLES

Goran Stojadinovic
TransNet NZ Limited

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Education:

- Master of Commercialisation & Entrepreneurship – University of Auckland
- Master of Electrical Engineering – Belgrade University, Serbia

SUMMARY OF RECENT UPDATES TO THE IEEE 400 OMNIBUS STANDARD ”Focusing on trends in cable testing

Pengwei Liu
Test and Sales Manager, HVdiagnostix

Pengwei Liu has dedicated his career to advancing the field of medium voltage cable testing and diagnostics, bringing deep technical expertise developed over 15 years in the power equipment industry.
Starting as a specialist in high-voltage systems, Pengwei has built comprehensive experience in ensuring the reliability and safety of high voltage power equipment.

Through his role at HVdiagnostix, Pengwei leads hands-on testing initiatives and provides specialized training. His work encompasses technical consultation, diagnostic implementation with machine vision, deep learning and machine learning techniques for both cable and switchgear, and the development of customized testing method that help clients optimize their power system maintenance programs.

Pengwei holds two master’s degrees in electrical engineering and is a certified Project Management Professional (PMP).

Beyond his professional duties, he maintains an active presence in the power systems community, regularly participating in industry forums and technical discussions to advance testing methodologies and diagnostic practices that enhance grid reliability.

UPDATE ON MV ACCESSORIES TRENDS

Andrew Wooles
Technical Manager – Cable Accessories, TransNet NZ Limited

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Andrew has held various power systems positions in the UK and moved to NZ in 2006 working on sub-transmission cables and has been in a technical / training role for the last 12 years for jointing products and practices.

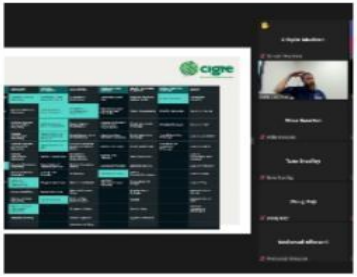
SUMMARY ON TB825 AND TB883 WITH A FOCUS ON MAINTENANCE OF CABLES

MV CABLE ARC MODEL TO DEVELOP ROBUST PROTECTION

NZ.B1 PANEL ANNUAL GENERAL MEETING (BY INVITATION)

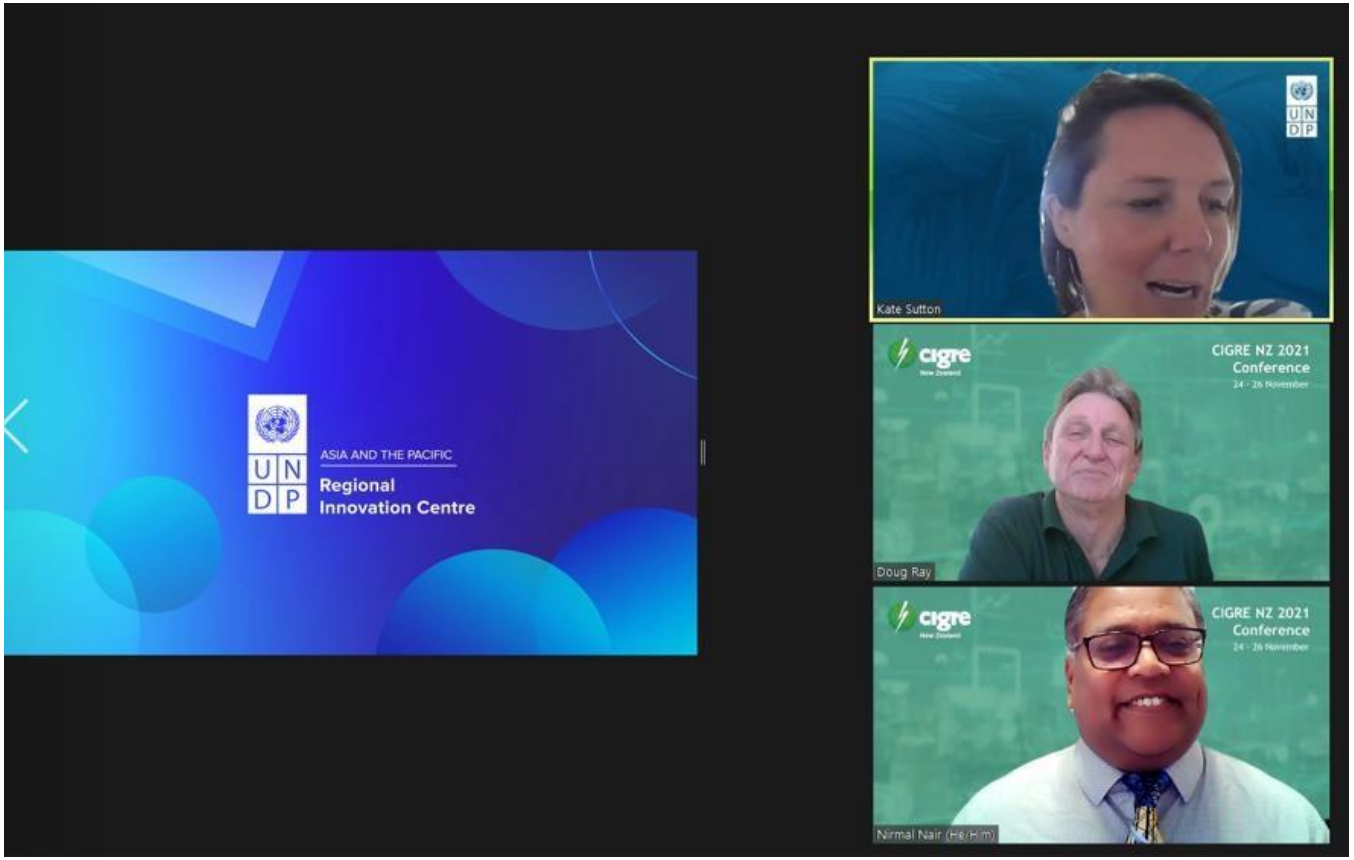
CIGRE NZ RECENT EVENT PHOTOS



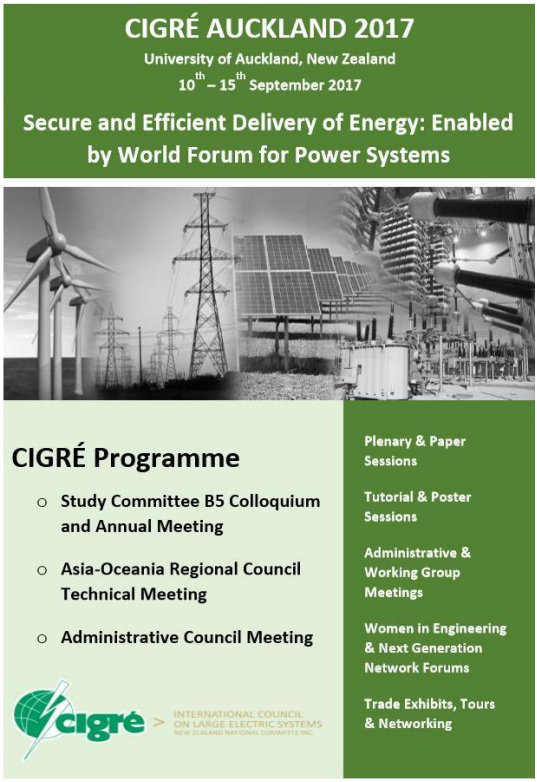







ASIA AND THE PACIFIC
Regional
Innovation Centre
Kate Sutton
CIGRE NZ 2021
Conference
24 - 26 November
Doug Ray
CIGRE NZ 2021
Conference
24 - 26 November
Nirmal Nair (He/Him)

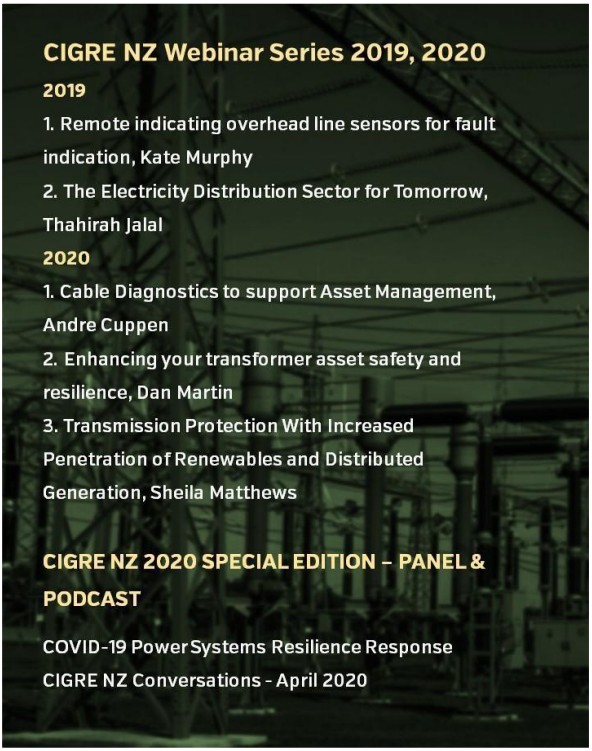
CIGRE PREVIOUS EVENTS




cigré
New Zealand
CIGRE NEW ZEALAND 2018
Tuesday 19 June 2018
Cigré New Zealand 2018 – One day event
Venue: SkyCity Convention Centre, Auckland
"Secure and efficient delivery of energy"
CIGRE New Zealand 2018 brings together experts and key players from the power system industry across New Zealand. The key events are:
• Keynote Speech by Rob Stephen, President of CIGRE
• Discussion on planned participation by NZ delegates for BIENNIAL CIGRE 2018 PARIS SESSION.
• Workshop / tutorial on emerging technology
• Meeting of CIGRE NZ's six interest groups (encompassing all the 16 CIGRE study committees)
• Women In Engineering (WIE) and Next Generation Network (NGN) meeting
This one day event is wholly sponsored by CIGRE NZ. This event is free subject to registration. A certificate of attendance will be given to participants to use as a Continuing Professional Development (CPD) benefit.
Next Generation Network (NGN)
Women In Engineering (WIE)
CIGRÉ Interest Group meeting (IG)
For registration and more infor


CIGRE ANZ 2018
Presented by Platinum Sponsor of AUPEC 2018
cigre
New Zealand
www.cigre.org.nz
29 November 2018
07:00 - 17:30
Science Centre, 23 Symonds St
University of Auckland
Transitioning New Zealand to a Low-Carbon Energy Future
Executive Plenary on 'Risk, Resilience and Sustainability'
Technology Leaders on 'Low-Carbon Technologies & Workforce'
Technical Presentations from CIGRE NZ Industry Practitioners
CIGRE Industry Forum with Innovation Leaders of NZ
AUPEC 2018 Auckland, New Zealand
Meet industry and academia professionals, practitioners, colleagues
Hear from and work with:
Industry Executives
Industry Operatives
Innovation Leaders
CIGRE Practitioners
Develop your expertise from their progressive experiences in moving towards a low carbon future
In association with AUPEC 2018 (Australasian Universities Power Engineering Conference)


CIGRE
2019 FORUM
cigre
New Zealand
www.cigre.org.nz
Asset Resilience within Electricity Networks
Hear from and network with
♦ Industry Executives
♦ Industry Operatives
♦ Innovation Leaders
♦ CIGRE Practitioners
SkyCity Convention Centre Auckland
24 June 2019
9:00 - 17:00
CIGRE ANZ 2018 exemplar
Meet industry and academia professionals, practitioners, colleagues
Develop your expertise from their progressive experiences in moving towards a more integrated asset resilient future
Spo


CIGRE NZ Webinar Series 2019, 2020
2019
1. Remote indicating overhead line sensors for fault indication, Kate Murphy
2. The Electricity Distribution Sector for Tomorrow, Thahirah Jalal
2020
1. Cable Diagnostics to support Asset Management, Andre Cuppen
2. Enhancing your transformer asset safety and resilience, Dan Martin
3. Transmission Protection With Increased Penetration of Renewables and Distributed Generation, Sheila Matthews
CIGRE NZ 2020 SPECIAL EDITION – PANEL & PODCAST
COVID-19 Power Systems Resilience Response
CIGRE NZ Conversations - April 2020


cigre
New Zealand
CIGRE NZ 2020
Conference
CIGRE centennial 2021
Shaping the power sector
beyond 2020
5th-6th August 2020
Auckland, New Zealand, and online
CIGRE NZ B1 Symposium
CIGRE NZ A2 Symposium
CIGRE NZ Study Committee updates
CIGRE International selected Study Committee updates
Presentations on Industry experiences


CIGRE NZ 2022 Conference
advancing our energy future
8th – 10th November
Whakatāne
cigre
New Zealand
Energy Systems for Sustainable Communities


cigre
New Zealand
2021
Conference
November
24-26
Building partnerships for end to end renewable power systems
cigre
For power system expertise


cigre
New Zealand
2022
Conference
November 8-10
Whakatane & Online
Energy Systems for
Sustainable Communities
cigre
For power system expertise
1 | Page

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Nga mihi nui
Thank you
Host and Conference Team