




CIGRE AUSTRALIA

1953 - 2023












The year 2023 marks the 70th year of CIGRE in Australia and we are proud to be a part of the Global CIGRE history which is now some 102 years old.

CIGRE Australia has always been a significant contributor to CIGRE Globally and in our 70 years has grown to be the eighth largest National Committee by numbers. However, our contribution over time has seen us 'punch well above our weight'. We have provided a global President (David Croft) two Global Treasurers (Peter Tyree and Richard Bevan) as well as Global Study Committee Chairs (Graham Vincent, Phil Southwell, Terry Krieg, Alex Cruickshank, Victor Tan) and many Working Group Convenors and participants over that time.

Through our technical panel convenors, we continue to hold a seat on each of the sixteen (16) global technical panels and contribute to the CIGRE body of work that is critical to our industry.

Australia has also developed and contributed the KMS global collaboration system and was instrumental in leading and influencing the global marketing program including seed ideas and IP for the global re branding and marketing platform.

Through the work of many people, we have been able to grow, influence global decisions, attract corporate memberships, (now over 100) and usefully contribute to the body of technical know-how and understanding in the industry.

We now have our own regular technical events – SEAPAC (South East Asia Protection Automation & Control) CIDER (Conference on the Integration of Distributed Energy Resources) Transformer Workshop and a developing webinar presence.

It is also perhaps appropriate that in our 70th year we have the honour of hosting an international CIGRE Symposium in Cairns which is shaping up to be one of, if not the largest CIGRE event outside of the biennial Paris Session. It will certainly provide an appropriate forum for us to continue to celebrate and recognise the results of the contributions of many members.

Notably, again through the consistent work and dedication of many, we have been able to develop a very strong and capable young engineers' group (NGN - Next Generation Network) and have this year (2023) been proud to support Phil Coughlan in his successful nomination as the global Chair of the NGN.

We believe CIGRE has a very bright and relevant future in the Australian Power environment as the nation transitions to the 'new world order' and a focus on renewable energy and the challenges and opportunities that will bring.

It is simply not possible to identify everybody who has contributed and had an influence on making CIGRE Australia what it is today. Our official record keeping is perhaps not what we would like, however thanks to some contributions from long serving members, we have been able to collect some historical snippets and anecdotes in this short collection which we hope you will find interesting and perhaps even ignite fond memories.

We thank all of our past and present members for their continued efforts and we wish all our members all the best for their endeavours and look forward to CIGRE becoming even stronger and more relevant over the next 70 years.

Sean McGoldrick
Chair, CIGRE Australia

Terry Killen
CEO, CIGRE Australia

Celebrating 70 years of CIGRE in Australia

The inaugural meeting of Australian National Committee was held on the 8th December, 1953.

Official Australian participation in CIGRE began with just eleven (11) members.

Now 70 years later we have 388 members and are the 8th largest CIGRE National Committee.

The History of CIGRE Australia

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Australian National Committee of CIGRE

Formed 8th December 1953

The formation of an Australian National Committee of CIGRE was first mooted in 1949 and this was followed by J. Tribot Laspiere in 1952.

The Australian National Committee (ANC) was established in the early 1950's largely at the instigation of Mr EL Merigan, then of the State Electricity Commission of Victoria and later Associate Commissioner of the Snowy Mountains Hydro-Electric Authority, Mr Merigan and Mr Milne of the Electricity Trust of South Australia were successful in 1952 in persuading the EESA to sponsor the formation of an Australian National Committee. Mr Merigan drafted the constitution of the new body.

Only an Australian National Committee member could nominate CIGRE members to participate in CIGRE Study Committees. At the instigation of EL Merigan Associate Commissioner of SMHEA the Electricity Supply Association of Australia at its 1952 meeting referred the question of forming an Australian National Committee of CIGRE to the EESA executive and at the 1953 meeting it was decided to support the formation of the ANC.

Those present formed the initial body of committee members:

R Liddelow (SECV and EESA)
VJF Brain (IE Aust, ECNSW, Electric Light and Power Supply Company Sydney)
LT Warner (SCC)
EL Merigan (SMHEA) 1956-1963
WJ Taylor (SECV)
AH Benjamin (HECT)
KH Milne (ETSA)
Grenfell Rudduck (Dept. of National Development)
AD Cadd (Secretary and Manager of EESA)

The inaugural meeting of the ANC took place on 8 December 1953 with 9 members present and 3 apologies. On the motion of EL Merigan the members of CIGRE decided to form an Australian Group of CIGRE and to elect an Australian National Committee. Mr R Liddelow was appointed Chair and appointed Mr EL Merigan as Deputy Chair, AH Cadd, who was Secretary and Manager of EESA was appointed Secretary of the ANC.

It was decided to initially seek participation in the following CIGRE International Study Committees:

- No. 3 High Tension Switching and Circuit Breakers
- No. 4 Relaying
- No. 8 Lightning and Surges
- No. 9 AC Transmission at Extra-high Voltages
- No. 13 System Stability and Load Frequency Control
- No. 15 Insulation Co-ordination

This selection was made because firstly Australia was particularly interested in these subjects, and secondly Australia already had or was acquiring experience of a nature which would enable its representations to make a valuable contribution to the work. It was realised that if these International Study committees were joined some action would be necessary in Australia to establish Sub-committees in Australia to assist the Australian Representative on each International Study Committee, or possibly as an alternate utilise existing Committees of the Electricity Supply Association of Australia.

It was agreed that all Australian states would join CIGRE and that the two main states, Victoria and New South Wales would alternatively chair the Australian National Committee.

At this stage the highest transmission voltage was 66kV but mostly 22 and 33kV It was agreed that to be a member of the Australian National Committee it was necessary to have or need to have transmission at 132kV or above.

1954: Second ANC Meeting

At the second meeting the Deputy Chair was in the chair. A Constitution was adopted and membership fees decided. It was decided to seek participation forthwith in ISN No. 9 and to nominate W Diesendorf of SMHEA to that ISC. It was also decided to investigate and purchase the formation of Australian Sub-Committees of ISC 4, ISC 8, ISC 9 and ISC 13.

1955: Third ANC Meeting

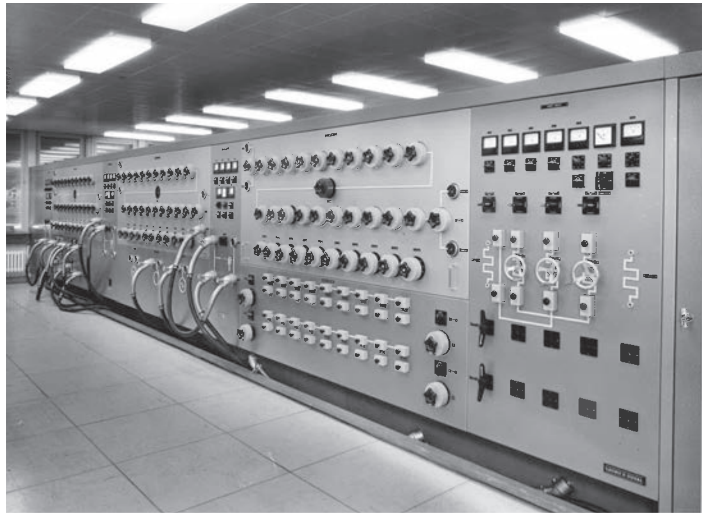
Records from the SMHEA show that in 1955 the Australian Sub-Committee of CIGRE International Study Committee No. 9 AC Transmission Lines at EHV was formed.

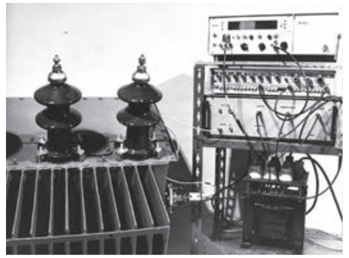
Present at the 1955 meeting were: VJF Brain EANSE, Dr W Diesendorf SMHEA (Convenor), Mr Dunster HECT, LH Lorimer SECV, RSA Olesnicki ETSA, JY Rollo ECNSW. At this time the decision was being taken to connect the Snowy Hydro Generation to Sydney, Melbourne and the ACT by 330kV transmission lines. Interest in EHV was high and a paper was prepared and presented in Paris by Dr Diesendorf.

1956: Fourth ANC Meeting

By the fourth ANC Meeting in 1956 EL Merigan (SMHEA) was Chair and AH Cadd continued as Secretary of ANC and EESA. These ANC leaders continued until J Purves became Secretary in 1963/64 with Merigan continuing as Chair until the 1963 meeting.

In accordance with a decision taken by the ANC in 1961 the Deputy Chair elected in 1961 and Chair elected in 1963, and their successors, would hold office for 4 year terms.





Australian National Committee of CIGRE

Chairs Over The Years

As of 2023 **(70 years later)** we have **388 members** and are the **8th largest CIGRE National Committee.**

Years	Chair
2021 - Current	Sean McGoldrick
2018 - 2021	Trevor Armstrong
2017 - 2018	Ed Wilson
2015 - 2017	Nino Ficca
2012 - 2015	Doug Aberle
2007 - 2012	Richard Bevan
2004 - 2007	Peter Tyree
2000 - 2004	Gordon Jardine
1995 - 2000	David Croft
1994 - 1995	George Bates
1989 - 1994	Neil Galwey
1987 - 1989	Ian Bates
1983 - 1987	F. Brady
1982 - 1983	R. Waldie
1978 - 1982	J. Johnson
1974 - 1978	J. Hurley
1968 - 1974	N. White
1956 - 1968	E. Merigan
1953 - 1956	R. Liddelow

The inaugural meeting of Australian National Committee was held on the **8th December, 1953.** Official Australian participation in CIGRE began with just **eleven (11) members.**

Australian National Committee of CIGRE

Growth & Development

1999

The Administrative Council of CIGRE approved the **"CIGRE Masterplan"** which was the result of an in-depth analysis at the higher level of the necessary transformation of the organisation, in order to better serve the interest of its member in the changing Electric Power Industry.

In parallel, the Technical Committee has established its **Strategic Plan 1998- 2008, which addressed** the needs of the new actors and the necessity to broaden the scope of CIGRE work. In essence Distribution was to become a full partner.

The present Study Committee organisation was initially set up in 1966 and modified in 1982 by adding three Study Committees.

Extensive co-ordination effort was needed at the Technical Committee level to manage overlapping between Study Committees when new subjects had to be studied and the new structure was implemented from early 2000.

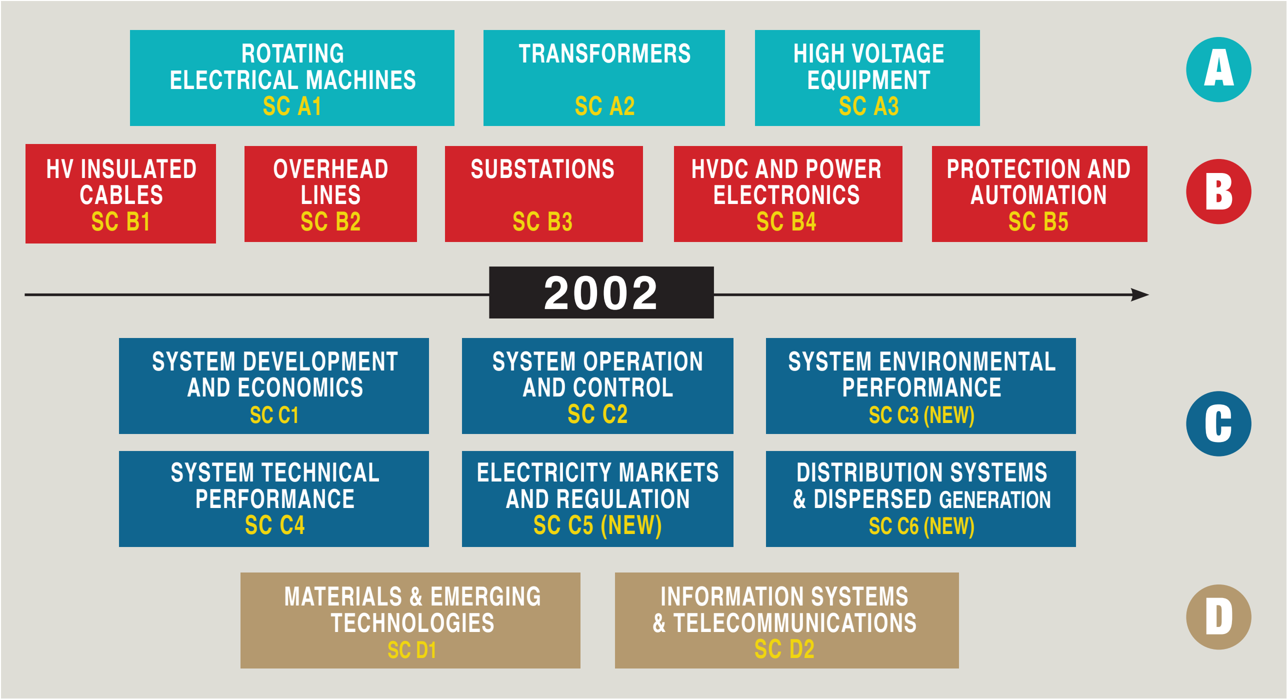
This was an opportune point in the history of the Electric Power Industry for CIGRE to go through a soul searching exercise and take a serious look at its role in the electricity world and the best ways of fulfilling this role. This would permit the organisation to play a leading role in transforming and revitalising the Industry.

CIGRE adapted its scope and structure to the new conditions, thus maintaining this world leading position in the Electric Power Industry area.

2000

Following the new regional dynamics, the first Regional Council was created in Asia and Oceania in May 2000: the AORC-CIGRE (Asia-Oceania Regional Council). Founders were the National Committees of Australia, China, India, Japan, Malaysia, South Korea and Thailand.

2002 - A New Organisation

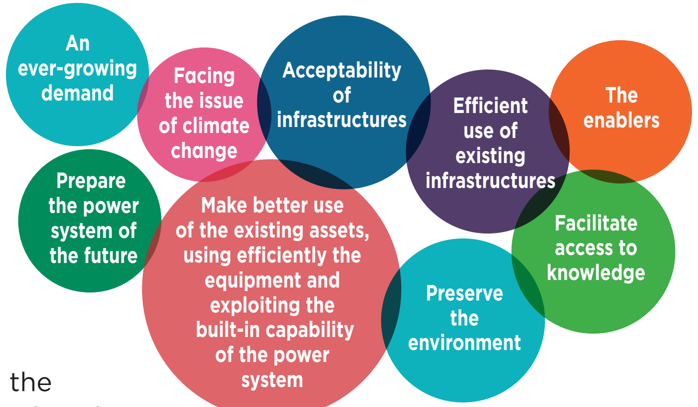


“Cigré Australia’s mission is to support our members in leveraging our global network with a local focus in mind”

The Power Systems of Tomorrow

Global Roadmap

The vision of the technical directions of CIGRE activities for the 2010s is outlined in the 2010-2020 Technical Committee Strategic Plan, drawn up under the guidance of Klaus Fröhlich, Technical Committee Chair. The contents of the Strategic Plan were put forward to the Administrative Council and were approved at the meeting of 23rd August 2010.



This Strategic Plan analyses the facts shaping the future of the power systems and defines the main axis of the activities of the Study Committees for the coming decade.

CIGRE’s coming to life stemmed from a world mobilization to face three major challenges: respond to the exponential growth in demand, provide electricity transmission over always longer distances, and develop the interconnection of systems. The process of innovation combining the consideration of these three challenges led to the use of higher and higher voltages and intensities. This escalation in voltages and size of systems created its own technical difficulties involving the planning, design, construction and operation of power systems.

Therefore, CIGRE had to work, especially from the 1950s, on the reliability and stability of power systems, which were becoming more and more interconnected, and whose vulnerability increased with the multiplication of exchanges.

CIGRE gradually asserted itself worldwide as a main technical forum for the stake-holders of the power systems. An essential key to its success, which has now lasted for almost 90 years, is that it has always managed to adapt to the extreme diversity of its members, both by their professional position and their geographic origin, and that it has made this diversity a source of individual and collective betterment.

Since 1921, CIGRE's priority role and "added value" has always been to facilitate mutual exchanges between all its components: network operators, manufacturers, universities and laboratories. It has continually led to the search for a good balance between the handling of daily problems encountered by its members in doing their jobs and the reflections on the future changes of power systems and their equipment.

Its role in exchanging information, synthesising state of the art, and serving members and industry has been constantly met by CIGRE throughout events and through publications resulting from the work of its Study Committees.

Above all, CIGRE allowed dialogue between the various electric energy professions, starting with network operators and manufacturers, generally facilitating the improved mastery of the innovation-development processes which were particularly difficult to implement in electricity networks. For a network is an assembly of components, with power and intelligence functions, whose design and manufacture require extremely varied expertise. All these components are complementary and interact, so that introduction of a new element could affect the whole, potentially jeopardizing security of supply.

The organizations that have been set up pragmatically by electric energy professions have always taken into account the difficult balance between experience and innovation that is one of the marks of their activity.

CIGRE's irreplaceable role consists in providing all power system professionals with a discussion forum, helping all of them to orient changes in their field according to the good general balance of resilience versus performance.

CIGRE was founded in 1921 with this aim and this vision, and throughout its long history, CIGRE has organised itself and its work in a spirit of cooperation between all the professions making up the electricity sector.

Being a CIGRE member really means belonging to a fundamentally cooperation oriented community, a community which has faith in human progress and betterment of life through good mastery of electrical technologies. These are based on the lever of development of power systems and on their many different benefits, which go largely beyond just the professional community of electrical engineers and are applied to all contemporary societies supplied with electricity.

Finally, in the long term, CIGRE has successfully taken up the many challenges:

- Keeping focused on engineering professions, combining the best expertise in their various technical forms (from the largest electro-mechanical equipment to the finest information and communication technologies), but also thematic forms (technical-economic affairs, development, engineering, tests, and operation),
- Keeping a good balance between the resolution of operation problems and a reflection on the technical changes and the needs of the future,
- Setting up an efficient organization based on Study Committees composed of national representatives, who express wide-ranging viewpoints, each Committee working continually within its field under the coordination of the Technical Committee,
- Disseminating knowledge to the community of electrical engineers through conferences and publications.

Hence, the world of electricity has constantly supported CIGRE and many top management people were personally involved in defining its objectives and methods of operation, emphasising regularly the benefits accruing to the electric utility industry from CIGRE.

From then on, a virtuous circle was created between the industry of large power systems and CIGRE, which explains the moral authority of an organization which, throughout its history has always been a key player in the field of large power systems.

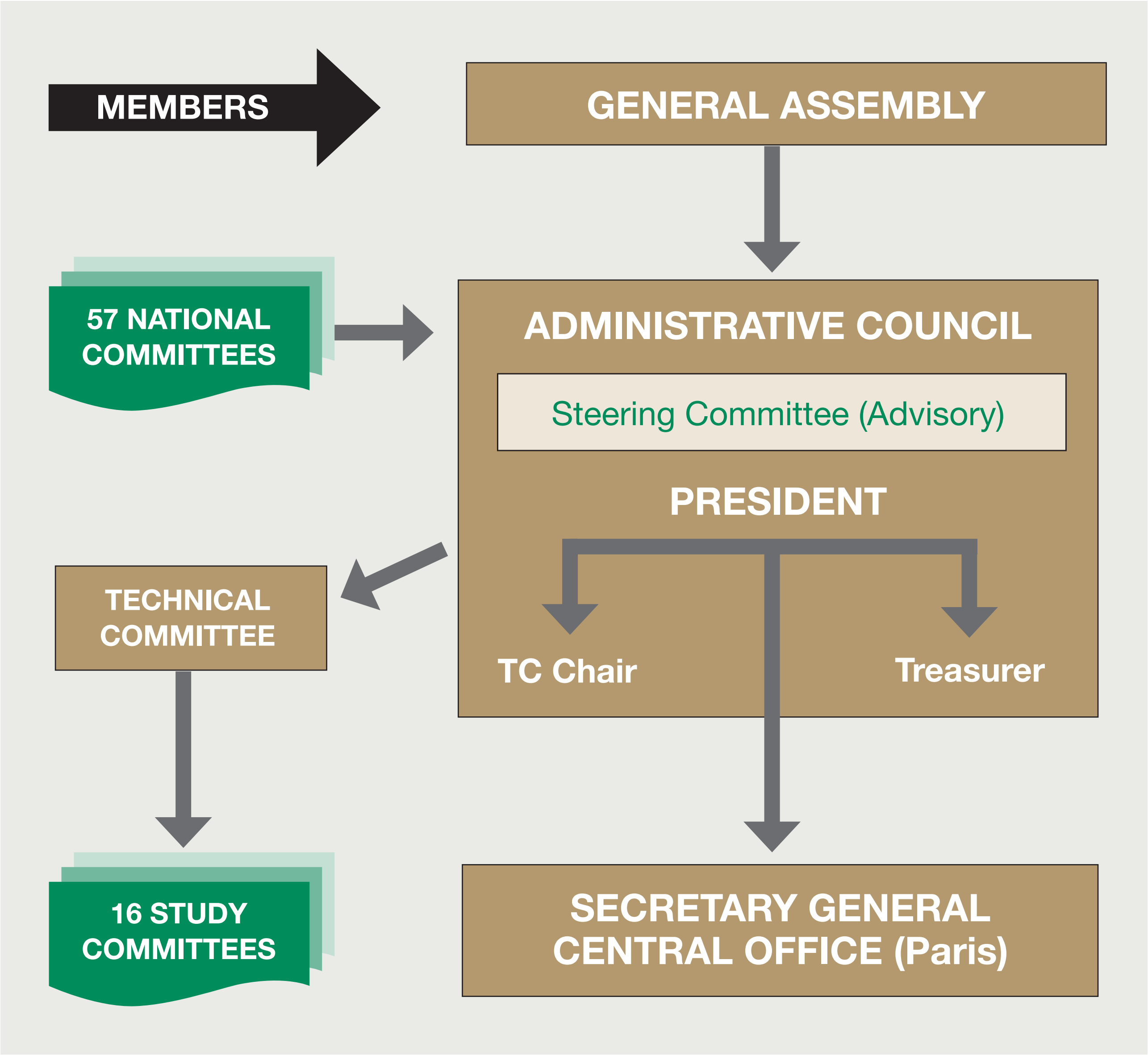
CIGRE Australia New Strategic Path

In early 2013 following falling membership numbers, the then board of CIGRE Australia implemented a new strategic path including a substantial marketing and branding campaign with the aim of revitalising the CIGRE brand and growing the member base.

The board appointed an external marketing company (Aspire) and an inaugural Chief Executive Officer (Terry Killen) to co-ordinate and manage the implementation of this new strategy and package and work with Aspire in promoting the awareness of CIGRE and its strength in the industry.

This strategy led to a renewed and modern website, creation of social media sites including **LinkedIn** and a **YouTube** channel, publication of our **In the Loop** and **Corona Times** industry newsletters and new industry events contributing to a year on year growth in membership numbers and financial standing over the last ten years.

CIGRE Organisational Chart



Australian National Committee of CIGRE

Next Generation Network (NGN)

The Next Generation Network (NGN) seeks to facilitate a successful transition into the power systems industry for early career professionals and students by providing technical resources and networking opportunities for personal and technical development. The NGN aims to ensure that the interests of new members are represented within CIGRE, both for their own benefit and for the future sustainability of CIGRE.

The goals of the NGN are:

- To encourage active membership of CIGRE NGN both for the benefit of NGN members and the NGN group.
- To organize and promote activities, such as technical visits, tutorials, and meetings for the CIGRE NGN.
- To organize appropriate CIGRE NGN networking events.
- To participate in active CIGRE Working Groups (WGs).
- To report to the CIGRE Steering Committee on a regular basis.
- To prepare and maintain a CIGRE NGN web and information platform.
- To improve communication between CIGRE and NGN members

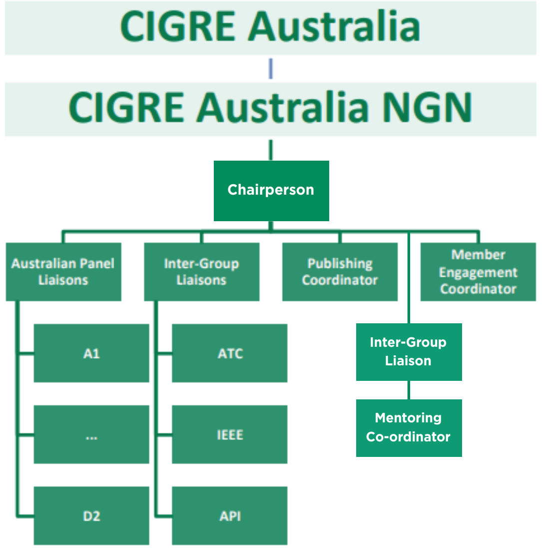
Launched in 2014

Dedicated NGN website:
www.ngn.org.au

Active engagement from 20 NGN Committee Members

Organisational Structure

CIGRE Australia NGN is a national organisation. The following image is the structure of the NGN:



Achievements

- Established a webinar program targeted at young members. This initiative aims to share industry knowledge to all interested NGN members.
- Created a new Women in Energy Australia (WiEA) group to empower both current and future female members to build fulfilling careers in the energy industry and in CIGRE.
- Ongoing development of a mentor program in consultation with student members.
- Facilitated presentations in CIGRE Australia events, including but not limited to, annual general meetings, technical committee seminars, panel meetings and conferences.
- Participated and supported working groups and AU Technical Panels as NGN corresponding members, full members or as Secretaries.


Event in Brisbane, Qld

Paris 2016

Established in 2020

Women in Energy

Women in Energy Australia is a group of CIGRE and NGN members, working together to empower both current and future female members to build fulfilling careers in the energy industry and in CIGRE. The Australian committee plays an integral role in supporting CIGRE's International Women in Energy group.

Australian power systems are undergoing unprecedented changes, so it is clear that there is no better time to promote diversity in the engineering industry to address the many associated technical challenges.

Inaugural Chair

Tara-Lee MacArthur

B.Eng Queensland University of Technology, MIEAust, CPEng, NER, RPEQ

The current gender diversity statistics for CIGRE Australia at each organisational level are given below:

Representation in CIGRE	# F/M	%
Executive Board	5/10	50%
AU National Committee	2/16	Conveners 12%
Panel membership	31/419	7%
NGN membership	58/235	25%

Vision

Women in Energy Australia (WiEA) is the leading platform for promoting inclusion in the power industry. We form the future of CIGRE, which accurately reflects the diversity of the society it serves and empowers the next generation to change the world.

Mission

Women in Energy Australia supports women and other minorities by providing links to global thought leaders and role models, as well as demonstrating the influence of female and other diverse professionals.

CIGRE Australia

Membership

CIGRE has been present in Australia since 1953 and currently has approximately 388 members with access to thousands of their employees. These members are drawn from across the industry including large electricity organisations, regulators, market operators, academia, manufacturers, and consulting firms. We also have a number of members from New Zealand who bring valuable experience from their own unique environment.

Additionally, we currently have in excess of 300 members in our young engineers network, Next Generation Network - NGN and 90 Student members. (Tertiary Students can join for free and participation in the NGN is free to individual 2 members and employees of Collective members who are under 35 years of age).

MEMBERSHIP CATEGORY	No.	Equiv.
Individual 1 + hon	243	243
Individual 2	30	15
Collective 1	107	624
Collective 2	8	24
Students	90	–
TOTAL	**478**	
EXCLUDING STUDENTS	**388**	**924**

CIGRE MEMBERSHIP			
1953	11 members	2015	193 members
1990	50 members	2017	266 members
2003	127 members	2019	286 members
2010	157 members	2021	337 members
2013	155 members	2023	388 members

CIGRE Australia Membership Growth 2022

10% **Total Members**

3% **Technical Panel Membership**

5% **Collective 1 Members**

21% **Young Engineers**

Ranked 8th by membership globally

"CIGRE creates good networks for experts to get together and enhance their understanding of technical issues on a global basis."

Australians Represented

The Evolution of Study Committees

STUDY COMMITTEES THROUGH HISTORY

Study Committees from 1927-2002

APPENDIX 2: CIGRE Study Committees from 1927 to 2002

1 Insulating Oils and Insulating Materials **1927-1966**
2 High Voltage Cables **1927-1966**
3 Interruptors **1927-1966**
4 Protection and Relays **1947-1966**
5 Insulators **1929-1968**
6 Overhead Lines **1931-1966**
7 Towers and Foundations **1935-1968**
8 Over voltages **1929-1967**
9 AC Very High Voltage **1945-1968**
10 Direct Current **1945-1966**
Ex 11 Interference **1947-1966**
11 Rotating Machines **1966-2002**
12 Transformers **1949-2002**
Ex 13 System Stability **1947-1966**
13 Switching Equipment **1966-2002**
Ex 14 HF Remote Transmissions **1948-1966**
14 DC Links & AC Power Electronics Equipment **1966-2002**
Ex 15 Coordination of Insulation **1948-1966**
15 Materials for Electrotechnology **1966-2002**
16 Transformers and Substations **1963-1971**
17 Generators **1949-1966**
18 Condensers **1955-1968**
19 Sudden Variations in Voltage **1963-1968**
21 High Voltage Insulated Cables **1966-2002**
22 Overhead Lines **1966-2002**
23 Transformers **1966-2002**
31 System Planning **1966-1982**
32 System Stability **1966-1982**
33 Insulation Coordination in Systems **1966-2002**
34 Protection of Power Systems & Local Control **1966-2002**
35 Telecommunications and Remote Control of Power Distribution Systems

1966-2002

36 Electromagnetic Compatibility of Power Distribution Systems 1966-2002
37 Planning and Development of Systems 1982-2002
38 Analysis and Technology of Systems 1982-2002
39 System Operation and Control 1982-2002
41 The Future of Transmission and of Power Distribution Systems

STUDY COMMITTEES FROM 2002 - 2023

APPENDIX 3: Fields of activities of the CIGRE Study Committees (since the 2002 reform)

Group A - Equipment

A1 Rotating electrical machines

Economics, design, construction, test, performance and materials for turbine generators, Hydro generators, high-power motors and non-conventional machines.

A2 Power transformers and reactors

Design, construction, manufacture and operation for all types of power transformers, including industrial power transformers, DC converters and phase-shift transformers, and for all types of reactors and transformer components (bushings, tap-changers, etc.)

A3 Transmission and distribution equipment

Theory, design, construction and operation of devices for switching, interrupting and limitation of currents, lightning arrestors, capacitors, insulators of busbars or switchgear, and instrument transformers.

Group B - Technologies

B1 Insulated cables

Theory, design, applications, manufacture, installation, tests, operation, maintenance and diagnostic techniques for land and submarine AC and DC insulated cable systems.

B2 Overhead lines

Design, study of electrical and mechanical characteristics and performance, route selection, construction, operation, management of service life, refurbishment, uprating and upgrading of overhead lines and their component parts, including: conductors, earth wires, insulators, pylons, foundations and earthing systems.

B3 Substations and electrical installations

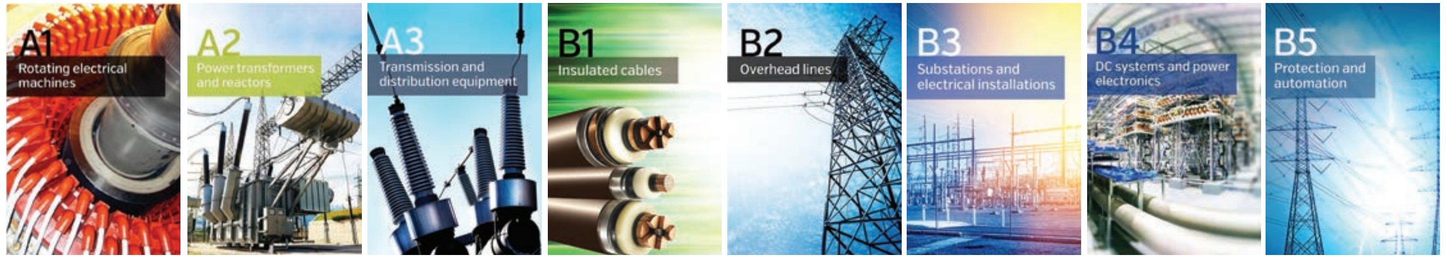
Design, construction, maintenance and ongoing management of substations and of electrical installations in power stations, excluding generators.

B4 DC systems and power electronics

Economics, application, planning, design, protection, control, construction and testing Of HVDC links and associated equipment. Power Electronics for AC systems and Power Quality Improvement and Advanced Power Electronics.

B5 Protection and automation

Principles, design, application and management of power system protection, substation control, automation, monitoring and recording, – including associated internal and external communications, substation metering systems and interfacing for remote control and monitoring.



Group C - Systems

C1 Power system development and economics

Economics and system analysis methods for the development of power systems: methods and tools for static and dynamic analysis, system change issues and study methods in various contexts, and asset management strategies.

C2 Power system operation and control

Technical and human resource aspects of operation: methods and tools for frequency, voltage and equipment control, operational planning and real-time security assessment, fault and restoration management, performance evaluation, control centre functionalities and operator training.

C3 Power system environmental performance

Identification and assessment of the environmental impacts of electric power systems and methods used for assessing and managing the environmental impact of system equipment.

C4 Power system technical performance

Methods and tools for power system analysis in the following fields: power quality performance, electromagnetic compatibility, lightning characteristics and system interaction, insulation coordination, analytical assessment of system security.

C5 Electricity markets and regulation

Analysis of different approaches in the organization of the Electric Supply Industry: different market structures and products, related techniques and tools, regulations aspects.

C6 Active distribution systems and distributed energy resources

Assessment of technical impact and requirements which new distribution features impose on the structure and operation of the system: widespread development of dispersed generation, application of energy storage devices, demand side management. Rural electrification.

Group D - New Materials and IT

D1 Materials and emerging test techniques

Monitoring and evaluation of new and existing materials for electrotechnology, diagnostic techniques and related knowledge rules and emerging technologies with expected impact on the system in medium to long term.

D2 Information systems and telecommunications

Principles, economics, design, engineering, performance, operation and maintenance of telecommunication and information networks and services for Electric Power Industry; monitoring of related technologies.

AU B5 STUDY COMMITTEE: Substation Automation & Communications Workshop

Published in **PT&D Magazine,** December 2003/January 2004

One of the focal points of the recent Cigre Study Committee B5 Colloquium held in Sydney at the end of September was the delivery of a technical workshop on Substation Communications.

The delivery of a technical workshop on Substation Communications. was somewhat of a pioneering step for the Study Committee that proved to be highly successful, with all sessions fully booked weeks prior to the event.

The workshop included two main parts:

1. Substation Automation - Working Australian Solutions
2. Substation Communications - IEC 61850 Update and Tutorial.

The Substation Automation part was led by two Australian Transmission Network Services Providers, SPI PowerNet and Powerlink, whereas international delegates, mainly IEC working group representatives, provided the IEC 61850 input.

This article overviews the content of the Australian substation automation component of the workshop.

As the concept of substation automation has become increasingly wide-ranging over time, to the extent that almost all "integration" or "systematic" activities are incorporated in the definition, the workshop chose to focus on two main areas: "Substation control and information management", and "Engineering access".

SUBSTATION CONTROL

SPI PowerNet, who have recently been involved in the process of architecting a "Substation Control and Information Management System" (SCIMS) and asset management approach within their network, presented their design and application concepts and demonstrated a "working" SCIMS installation that was being applied on a current substation rebuild project. The objectives of this asset framework are to:

- acquire, process, and manage information within the substation
- realise the embedded value within the new digital technology
- enable data gathering for operational and asset management purposes
- build "future substations" through a variety of incremental and quantum change scenarios

In conjunction with these objectives the following key design concepts were identified and introduced:

- overlay existing infrastructure with digital technology (manage the technology evolution)
- where practical, interface "old" with "new" in the digital signalling realm (eg. PLCs, RTUs)
- reduce/eliminate parallel hard-wiring (eg. between protection relays and station controller)
- integrate functions into composite intelligent devices (e.g. protection, control, measurements)
- measure once, convert to digital form and then re-use for multiple applications

SYSTEMS-ENGINEERING TOOLS

The workshop also outlined a number of systems-engineering tools that had been developed to assist with the creation of the required digital database mapping that forms the "blue-print" of the SCIMS digital connectivity as well as to automate the population of the station "RTU" and HMI databases at the substation. An interesting aspect concerning these tools is that they are based on a standard Microsoft Office programme (MS Excel) which, coupled with ActiveX controls, achieve their functions within an "open systems" environment An insight was given into the complexities involved in communications protocol conversion at the working level, and the paradigm shift that is required when implementing these types of systems within a traditional substation environment where digital inter-device communications systems have not previously been installed.

ENGINEERING ACCESS

In the area of remote engineering access to electronic equipment at the substation, the workshop introduced and demonstrated a variety of models, based on specifically applied technology and communications capability ranging from simple dial-up telephone line access through to WAN-based interrogation.

Of particular interest was the Powerlink OpsWAN system (which consists of a collection of computer servers and intelligent devices connected on an operational WAN) that has been installed at 42 sites across a transmission network area in Queensland of about 1800 km in length. The objectives of this system are to:

- increase the level of substation data available, thus resulting in improved fault management, condition monitoring, and asset performance management
- reduce maintenance costs through better collation of systems and plant knowledge
- minimize market/business exposures by enabling critical decisions to be made with detailed information, previously only available by visiting the site

Indicative achievements of this Powerlink system in the area of fault management include a reduction in site visits by 16%, immediate call-outs have been lowered by 20%, and in a number of cases network assets were able to be restored more rapidly resulting in dramatically reduced outage times.

Live demonstrations were given (via a Telstra ISDN connection at the conference venue) on the installed video camera systems, installed protection and control equipment at various sites were interrogated, DC battery systems were monitored, and a number of other specific primary plant monitoring systems were demonstrated.

A number of Powerlink case studies were presented where there had been notable operational benefits provided by the OpsWAN system, many of which involved significant reduction in plant outage times, and improved management of plant performance and operational risk.

SUMMARY

From the interaction with delegates following the technical workshop it was apparent that, in relation to the presented material, the Australian utility industry is well advanced on an international scale in the areas of substation automation and remote engineering access capabilities.

Anyone having an interest in obtaining more information on the systems mentioned in this article is welcome to contact John Theunissen of SPI PowerNet (jtheunissen@spipowernet.com.au) or Barrie Moore of Powerlink (bmoore@powerlink.com.au).

SC B5 Workshop: Beyond Communication Standardisation

Published in **PT&D Magazine,** December 2003/January 2004

by Luc Hossenlopp, ALSTOM T&D Energy Automation & Information Systems

The aim of this paper is to analyse and discuss the possibility of combining advances in both communication and application technologies, in order to bring further benefits to modern substation automation: smoother investments and reduced lead times.

Significant efforts have recently been devoted to substation communication standardisation, initially with UCA2 then IEC 61850, and first solutions are now commercially available. Although extremely powerful the UCA2/IEC61850 documents do not define the full solution.

Another trend observed over the years is the definition of standard protection, control and measurement bays, i.e. set of IEDs or IED panels matching one electro-technical set of primary devices and functions that can be repeated from one substation to another of the same owner with minor modifications. This approach is reducing the design and maintenance costs but is currently totally user specific.

The aim of this paper is to analyse the limits of these two approaches and discuss the capability to combine both communication and application directions, in order to bring further benefits to modern substation automation: smoother investments, reduced lead time, etc.

1. STANDARD COMMUNICATION PROTOCOLS

1.1 A new generation of standard

UCA2/IEC 61850 are a definite step towards unified substation communication, compared to the former IEC 60870-5-103, DNP3 and most proprietary protocols:

- speed of exchanges: 100 Mbps instead of few 10 kbps, enabling more data to be exchanged for a better operation or maintenance of the system,
- peer-to-peer links, replacing conventional wires with no extra hardware but and also permitting the design of innovative automation schemes,
- client-server relations offering flexible solutions easy to upgrade compared to master slave communications,
- object oriented pre-defined names, creating a single vocabulary between users, suppliers and supplier's devices therefore facilitating the system integration and commissioning,
- XML interfaces referencing the above objects for straightforward exchanges between engineering tools in order to optimise the data consistency and minimise project lead times.

1.2 Communication standard limits

Although extremely detailed and flexible this new generation of standard is only a toolbox to define substation automation. It provides a sort of "microscopic" and uniform view of possible information to be exchanged in the substation. But it does not define an overall functional picture that can be easily translated into a real system nor handle the system behaviour of interconnected devices.

Taking an EHV feeder for instance, it is not explicit whether an automatic recloser will inter-operate with the protection trips nor the way a redundant recloser facility will be managed (figure 1). As a consequence if this function is needed it will request dedicated specification and inter-operability tests during the course of the project. This will be done using the detailed object names, therefore requiring both substation automation skills and an in-depth knowledge of the standard.

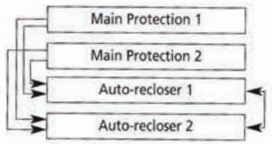


Figure 1: Coordination scheme principle of protection and recloser

This philosophy results from the will of the standard designer team to permit multiple use of the toolbox. The counterpart of this freedom is the potential work needed when assembling a system made of real devices coming from several origins. The bay approach explained in section 3 leverages the standard capabilities while reducing the complexity for the user.

1.3 Inter-operability

IEC 61850 part 10 will define conformance tests: this is a necessary but not sufficient condition for inter-operability. Mixing devices from different suppliers or defining specific automation is therefore requesting additional tasks to prove it will work. Conformance tests are played in front of a reference simulator. Inter-operability tests involve the real devices, with many more possible combinations. They must check the nominal behaviour but also degraded cases and assess the performances. They are quite demanding especially for the exhaustive test of distributed automation, network or application redundancy. This is another area where bay approach brings benefits by structuring the job (figure 2):

(1) Each type of bay is first tested on its own, covering the example of the Auto-recloser (AR)/Main Protection (MP) co-ordination mentioned above

(2) Vertical flows, i.e. supervision and control of the bay from the substation control point (OI: Operator Interface) and telecontrol point (remote SCADA link) are then validated per bay,

(3) Finally relations between bays are checked where interactions are traditionally limited. Only this last step is really project specific while previous ones are generic. (Cont. page 58)

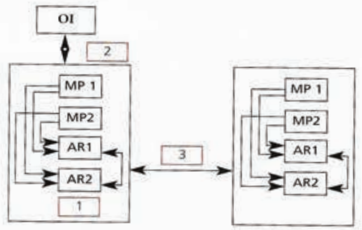


Figure 2: Structuring interoperability tests

2. STANDARD BAY & SUBSTATION SCHEMES

2.1 Standard bay concept

Standard bays have been installed for years in various transmission substation utilities. A standard bay is defined in this context as one or more panels containing the protection, control and measurement devices needed for the management of a feeder or a transformer. Its rationale is the simplification of the substation engineering and staff training, matching the electro-technical organisation. For instance (figure 3) a 220 kV feeder bay will typically be made of 2 main protection devices (also providing disturbance record and auto-recloser), a bay computer (0.2% measurement accuracy, local control through LCD, interlocking, synchro-check for manual close) and a busbar protection.

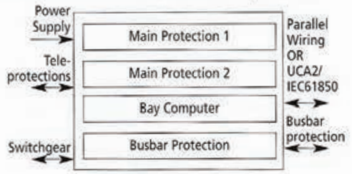


Figure 3: Standard bay content and interface

Standard bays are a step between the single device and the full SAS, and bring the following benefits:

- Better flexibility (for the user) than the SAS since avoiding to be linked to a single (or main) supplier, while reducing the engineering work compared to the purchase of separate IEDs.
- Capability for the supplier to optimise, internally to the bay, each component, therefore reducing the total costs. Integration of third party relays is a must in order to be in line with protection policy usually requested by transmission users.

2.2 Standard substation concept

A similar development is occurring in distribution substations. The concept of the 'one-box solution' able to perform all protection, control and measurement features has been accepted for 15 years for feeder lines out of substations. The new trend is increasing the integration level of such products with pre-engineered features, minimising the total cost of ownership and able to be used in a green-field or a step-by-step retrofit project. Three levels are considered (figure 4):

- A series of MV feeders, with their associated busbar and incoming supply (1).
- It optionally integrates the transformer (2), the transformer bay itself being a level 1 component.
- A full HV/MV substation with an 'H' configuration can be assembled from such modules (3). Additional automation, such as a transformer switch, can be added as an option.

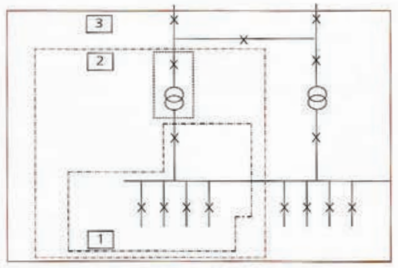


Figure 4: Standard distribution substation

2.3 Standard bay analysis

For years several utilities have worked on some standard bay concepts. For national transmission utilities this has resulted in the definition of 50 (in Belgium) to 80 (in France) "standard" bays, quite a large number with apparently little opportunity for multi-customer bay standardisation.

The differences between the bays of a single family (ie. a feeder or a transformer) result from several factors:

- The electrical network, that is using several protection and automatic reclosing schemes, depending on performances needed.
- The substation topology variations, for instance adding or deleting switchgear compared to the general scheme: this has an impact on the amount of information exchanged and substation logic.
- The retrofit constraints for the secondary devices: line differential protections are for example depending on the other line side.
- The grouping made of elementary bays. This is best illustrated by the transformer bay that may or not take into account the line. More generally it reflects the cost effective grouping of features related to the substation topology itself (I/Os, protection of intra-substation devices, etc).

The large number of bays is obtained by combining these various independent factors. Some additional differences, normally not encountered within one single user but between similar bays of different users include:

- Operational logic, internal to the bay or between the bays, such as interlocking, inter-tripping, etc.
- Physical interfaces such as connectors, security switches, tests plugs, etc.

2.4 Impact of the communication technologies

Communication technologies contribute to the overall cost reduction through:

- The capability to progressively "productise" the bay described above, i.e. find a way to reuse the same product for different purpose while minimising the changes between the applications.
- New maintenance application facilities even in the absence of a complete substation automation system.

The traditional interface of a standard bay is by a series of wires, connected to a central RTU/SOE/wall mimic and primary equipment. The first series (typically 100- 200 per EHV bay for RTU/SOE/Mimic) can be replaced by a single Ethernet fibre optic link flexibly configured by software according to exact substation requirements. Late changes, as often encountered during factory or site acceptance tests, simply require the related database modifications. "Productisation" also rely on modern multi-functional platform (i.e. same hardware running multiple functions) with powerful programming capabilities.

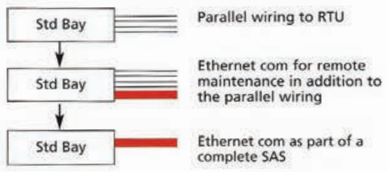


Figure 5: Standard bay applications

The standard bay product offers a smooth investment path for substation upgrading (figure 5). There is no need to have any SAS technology installed to start applying a standard bay. Ideally it will be simply interfaced to a PC for cost-effective remote maintenance access, which is an efficient solution between a fully automated substation and a conventional design. It can be fully reused in further upgrading to a complete DCS approach. *(Cont. page 60)*

3. OPTIMISING COMMUNICATION & SCHEME APPROACHES

This section discusses a way to further leverage on the new communication standard when designing the bay. This is first an internal methodology used as a project specification guide. It might also be a seed for a further generation of standards, based on the IEC 61850/UCA2 and making it more accessible to the end users.

3.1 Overview

A classical constraint when designing a bay (or a substation) is to fully specify its functions especially in a retrofit environment, which frequently results from the various experiences made by the end user in real situations. Also the precise interface definition is not trivial.

A step forward in the "productification" of the bay requires:

- A way to formally describe it: the UCA2/IEC 61850 is a starting point, where detailed logic for instance shall be added.
- The definition of a series of software libraries forming the base of the standard bays, fully tested and reusable between different users. These libraries must have a sufficient abstraction level to be easily understood by non software specialist users while permitting an expert to make changes for a specific need.
- Engineering tools able to handle the libraries and create the real project.

3.2 Extending UCA2/IEC 61850 descriptions

The UCA2/IEC 61850 shall be complemented by (figure 6):

- An automation language, able to define the logic that shall exist between the different signals. IEC1131-3 it is a candidate.
- A graphical language, able to define the representation of the single line diagram. The SVG is an XML extension and can be used for that purpose.
- Physical interfaces description. This is describing the various connectors (communication, process), process interface voltage circuit and the operator interface on the bay (LCD, buttons, LEDs).
- The testing procedure principles that shall be passed before accepting the bay or made on site during maintenance operations.

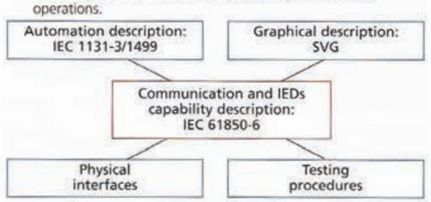


Figure 6: Complete substation description

3.3 Libraries

While a project will definitely be specific it can rely on re-usable components that can be organised in the following progressive specialisation layers (figure 7):

- Scheme layer, both for functions and topology. This is an intermediate step between the UCA2/IEC61850 "microscopic" vision and a more global vision.
- One example of a function scheme is the association of a distance and line differential protections, automatic recloser, disturbance recorder (each being an IEC 61850 logical node, LN) and the internal logic between these functions.
- One example of topology scheme is the union of the circuit breaker, the two busbar disconnectors, the earthing switch, etc. (each being an IEC 61850 logical node, LN) and their graphical representation.
- Utility template is an aggregate of standard functional schemes that will be reused in various substations of the same utility. This is for example the complete representation of a feeder in term of function, I/Os, graphical and logic. This is a local standard that shall be engineered per utility.
- Project mapping, this is where the equivalence is done between the utility specification and the real devices supporting them, as well as the fine tuning with the exact situation.

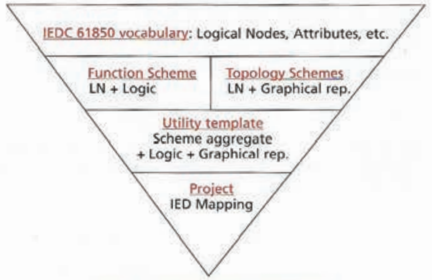


Figure 7: Structuring the libraries reuse

3.4 Project process

Once the standard bays are defined they can be considered as a standard product, reducing the project lead time:

- Standard bays will first pass a type test and can then be re-used for several projects with minimum checks, eventually suppressing the factory acceptance tests;
- Purchasing and manufacturing of the components can be made more efficiently.

For a given bay the customer will typically:

- Deliver the exact substation single line diagram, including for instance topology and circuit names.
- Amend the standard document with the exact interface and automation only when relevant.
- Define the imposed IEDs if applicable.
- Define the telecontrol addresses per information.
- Define the protection setting, so that the bay can be directly connected at site without further changes.

For a given bay the manufacturer will use the configuration tool to:

- Add the name of the real devices and eventually some inputs-outputs relevant with the real devices (such as self-check status or hardware mimic).
- Adjust the number of information and graphical representation to the exact needs, especially in case of a retrofit where some data may have to be suppressed or exceptionally added.
- Create the cubicle and eventually finalise the interface and logic definition.

STANDARDISATION OPPORTUNITIES

There are several opportunities for standardisation in this field, the aim being to accelerate the design of substation automation:

- Description methodology. At least the automation and graphical part could be achieved easily since based on other standard.
- Libraries. Functional and topology schemes as defined above could be achieved progressively. This is however requesting a cooperation between users.

CONCLUSION

The new generation of communication standard brings a lot of opportunities for optimising the automation and maintenance within or between substations. The full benefits will be seen only if their use is properly organised.

This paper has shown how the concept of standard bay, already existing in conventional substations and extensible to the complete distribution substation, is a base for structuring this work. The aim is to define a product in order to minimise the engineering work therefore optimising the costs. Eventually this could be extended to an application standard that would facilitate the substation automation specification, design and test.

Australian National Committee of CIGRE

Awards

CIGRE MEDAL 2021
Richard BEVAN (Australia)
Former CIGRE Treasurer and former Chair of the Australian National Committee

CIGRE FELLOW 2016
Phil SOUTHWELL

CIGRE HONORARY *(AUS)*
1996 **Philip W. DULHUNTY**
2000 **Graham F. VINCENT**
2004 **David G. CROFT**
2008 **Peter TYREE**
2014 **Phil SOUTHWELL**
2016 **Richard BEVAN**
2018 **Terry KRIEG**
2020 **Doug ABERLE**

TECHNICAL COUNCIL AWARD 1996
39 Power system operation and control **David CROFT** *(AUS)*
36 Power system electromagnetic compatibility **Anthony WILSON** *(AUS)*
33 Power system insulation co-ordination **Juris RUNGIS** *(AUS)*

1999
37 Power system planning and development **Peter WALLACE** *(AUS)*

2000
38 Power system analysis and techniques **John STEWART** *(AUS)*
22 Overhead lines **Christopher FITZGERALD** *(AUS)*

2001
33 Power system insulation co-ordination **Ronald OWEN** *(AUS)*

2002
23 Substations **Simon BARTLETT** *(AUS)*
15 Materials for electrotechnology **David ALLAN** *(AUS)*

2003
A3 Transmission and distribution equipment **Steven JONES** *(AUS)*

2004
C1 Power system development and economics **Phil SOUTHWELL** *(AUS)*
B1 Insulated cables **Kenneth BARBER** *(AUS)*
A2 Power transformers and reactors **Peter AUSTIN** *(AUS)*

2006
C6 Active distribution systems and distributed energy resources **Alex BAITCH** *(AUS)*
C2 Power system operation and control **Kenneth BROWN** *(AUS)*

2007
C2 Power system operation and control **Ian ARNOTT** *(AUS)*

2008
B2 Overhead lines **Gary BRENNAN** *(AUS)*
A1 Rotating electrical machines **John LINTON** *(AUS)*

2011
C3 Power system environmental performance **Stephen MARTIN** *(AUS)*
B5 Protection and automation **Rodney HUGHES** *(AUS)*

2012
D2 Information systems and telecommunication **Robert EVANS** *(AUS)*
C1 Power system development and economics **David BONES** *(AUS)*
B4 DC systems and power electronics **Nalin PAHALAWATHTHA** *(AUS)*

2021
D2 Information systems and telecommunication **Victor TAN** *(AUS)*
C5 Electricity markets and regulation **David BOWKER** *(AUS)*

2022
B5 Protection and automation **Peter BISHOP** *(AUS)*

DISTINGUISHED MEMBERS *(AUS)*
1996 **Frank BRADY**
William PRICE
N WHITE
1988 **Dr David ALLAN**
1998 **Kenneth BARBER**
Dr Ralph CRAVEN
2000 **Prof.Dr Ronald JAMES**
2002 **Bryce CORDEROY**
Dr Vincent MORGAN
2004 **Philip DULHUNTY**
2018 **Hans MAYER**
2020 **Ken ASH**
Alex BAITCH
Simon BARTLETT
Rod HUGHES
2022 **Steve JONES**

NEXT GENERATION SIGNIFICANT CONTRIBUTION AWARD
2020
Tara-Lee McARTHUR *(AUS)*
2022
Madeline BINET *(AUS)*
Matthew ZILLMANN *(AUS)*

WOMEN IN ENERGY AWARD 2022
Genevieve LIETZ *(AUS)*

THE CIGRE PIONEER E-SESSION ACHIEVEMENT AWARD 2020
Peter WIEHE
Wayne PEPPER
Russell WHEATLAND
Les BRAND
Babak BADZADEH
Andrew HALLEY
David BOWKER
Victor TAN

Most Recent Distinguished Member Award

Mr Steve Jones is the recipient of the prestigious Distinguished Member award, which is granted to a few select individuals in each Paris Session year in recognition of their long term input and support of the Technical work carried out by CIGRE both locally and Internationally.

Mr Jones has been a long time member of CIGRE Australia and previous board member and Chair of our local Technical Committee as well as serving on several international Working Groups and Study Committees.

Mr Jones said he was honoured to receive the award and had enjoyed his time in CIGRE and made many long term friendships through his involvement. Steve maintains his membership and is looking forward to attending the CIGRE Symposium in Cairns this September.

Steve Jones (left) receiving his award from CIGRE Australia CEO, Terry Killen.

Longest Serving Collective Member

The State based utilities of SECV, ETSA and HECT were among the earliest CIGRE Members.

All those organisations have undergone substantial changes over the last 70 years, however their descendant companies remain active members today – AusNet Services, Citipower, SA PowerNetworks, ElectraNet, Snowy Hydro and even AEMO can trace their ancestory back to those early state utilities.

Longest Serving Individual Member

Mr JL Harvey was an Individual member of CIGRE from 1963 through to 2000.

Current Longest Serving Individual member

Mr Rajarashi Dasgupta became an individual member of CIGRE in 1985 and continues his membership today in 2023.

Presidents: D Croft (2000-2004), Y Filion (2004-2008) et A Merlin (2008-?)

CIGRE General Session 2002 - Aussie Night

GLOBAL STUDY COMMITTEE CHAIRS

SC 35	Graham Vincent	1992-2000
SC C1	Phil Southwell	2009-2014
SC B3	Terry Krieg	2012-2018
SC C5	Alex Cruickshank	2020-2024
SC D2	Victor Tan	2022-2028

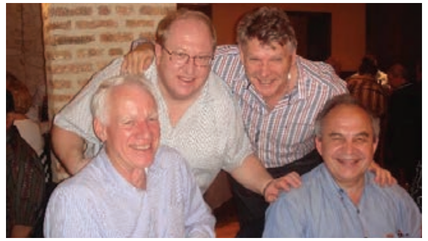
CIGRE General Session 2002 - Aussie Night

Overhead Lines Greenbook Authors 2014

CIGRE General Session 2002 - Aussie Night

Celebrating Vic Morgan ESI & CIGRE Contribution 2009
L to R: Vincent Morgan, Gary Brennan, Henry Hawes.

CIGRE General Session 2008 - Aussie Night



CIGRE General Session 2008 - Aussie Night

L to R: Garry Brennan 2000-2009, Robert Lake 2009-2016, John McCormack 2017-2022.

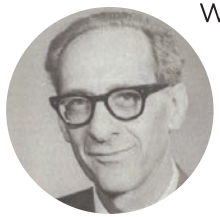
AU B5 Annual Panel Meeting - 2005 Perth

AP B2 Panel Meeting - 2012 Perth >

D2 Panel - July 2018

CIGRE Australia People

1950's and 1960's



Walter Diesendorf had been a prime mover for the Australian involvement in CIGRE in the 1950's. He had first published a CIGRE paper when he was with AEG Union in Vienna in 1935. Mutual Capacity Effects of Parallel High Voltage Transmission Lines – E Gross and W Diesendorf, CIGRE Paris Report No. 341/1935.

In 1960's Walter Diesendorf also got the University of Sydney more involved in CIGRE Australia.

After he joined the Snowy Scheme in 1950, Walter was certainly keen to get his CIGRE connections, working as he was investigation options for the "supergrid". He led investigation and decision making on the 330kv system. He also hosted some events of international CIGRE meetings in his home in the 1950's and early 1960's.

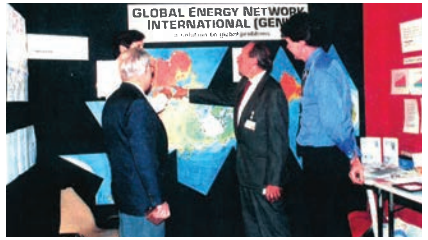
1992

As the Deputy Chair of the ANC and Honorary Life Member of CIGRE Philip Dulhunty was a member of the Administrative Council.

One of his jobs was to lead some 15 International council members on a visit to Russia to view the latest 500kv transmission line in Uzbekistan.

Dulhunty with his CIGRE Executive colleagues in Tashkent ...
all the top engineering executives from member countries are present.











Australian Power *Milestones*

1959: High Voltage Interconnections

The construction of the Snowy Scheme resulted in the interconnection of the two largest systems, NSW and Victoria in 1959.

This was the time to include consultants and manufactures in the Australian National Committee so, following the Brazilian example, local "Panels" were formed to mirror the work of the International Study Committees. As an example, the International Study Committee 6 which covered "overhead" lines was represented here by AP6 (Australian Panel 6). The local Panel Convenor was then the representative on the International Study Committee.

It was the Panel Convenors job to recruit experts or would-be experts in the subject to join the Australian Panel.

At this time in CIGRE the Study Committee numbers were simply allocated as the needs arose, for example, the Overhead Lines Committee was SC6 because it was the sixth Committee to be formed.

1987

The first wind farm in Australia and WA. The Salmon Beach Wind Farm near Esperance was the first wind farm in Australia, with six turbines that operated for nearly 15 years. The asset was decommissioned in 2002 due to the age of the turbines and larger, more cost-effective units that had since become available.

1990

The next major interconnection was made linking South Australia – creating an interconnection of three states.

1995

Saw the adoption of a Competition Policy by Australian Governments (COAG).

1998

The Full National Market commences (NSW, Victoria, South Australia, ACT and QLD).

2011

The first commercial-scale PV power plant the 1 MW Uterne Solar Power Station was opened.

2012

Greenough River Solar Farm opened with a capacity of 10 MW. The price of photovoltaics has been decreasing and, in **January 2013**, was less than half the cost of using grid electricity in Australia.

Australian National Committee of CIGRE

Conferences & Meetings

Regional Meetings

Regional meetings of CIGRE have been organised under the auspices of the ANC.

First on 8–13 November 1987 at the Hilton International Hotel, Sydney, NSW.

"Developing Transmission Systems – The Challenge in South-East Asia and the Western Pacific Region".

The Regional meeting was divided into 14 Sessions over 4 days and included Technical Tours to CSIRO and Sydney County Council High power Testing Station and a social program.

CIGRE Regional Meeting - Sydney, November 1987
L to R: Kevin Hesse - Australian Member Study Committee 23 Substations (SC23), Yves Porcheron - Chairman Study Committee 22 Overhead Lines (SC22), Phil Dulhunty - Australian Member SC22, Frank Brady - Chairman Australian National Committee, G. Leroy - General Secretary of CIGRE, Theo Ykema - Chairman SC23, Karl-Heinz Schneider - Chairman Technical Committee of CIGRE.

Second Regional Meeting was held at the Gold Coast, QLD in 1993.

Third Regional Meeting was held at the Hilton on the Park, Melbourne, VIC in 1997.

Third Regional Meeting

The first sponsors were:

- Tyree – Westinghouse Ltd
- Transfield Ltd
- Sprecher – Energie Australia Pty Ltd
- Siemens Ltd
- Olex Cables Pty Ltd
- Mitsu & Co Australia Ltd
- MM Metals – a Division of Metal Manufactures Limited
- GSE Australia Ltd
- Fanner – PLP Pty Ltd
- Electricity Supply Association of Australia
- Electricity Commission of New South Wales
- Electric Power Transmission Pty Ltd
- Dulmision Pty Ltd
- Brown Boveri (Aust) Pty Ltd
- Balfour Beatty Power construction Pty Ltd
- Austrade
- Asea Pty Ltd

SEAPAC

SEAPAC was instigated in 2007 as an initiative to promote technical discussion within Australia with the original outcome objective "to have a second SEAPAC."

The first three SEAPAC were essentially entirely organised and promoted by the AU.B5 panel members with the National Committee effectively only handling financial aspects. SEAPAC 2013 involved the use of an external event company to reduce the time burden on Panel members and the Convener in particular and the National Committee taking a more direct (and welcomed) role in organising and promoting.

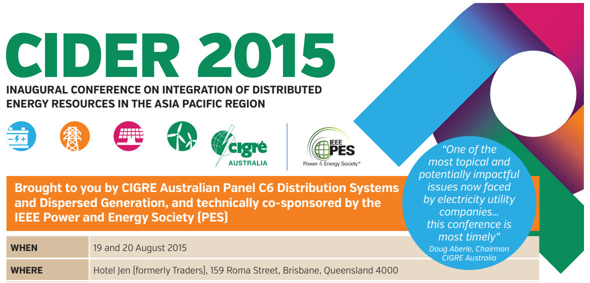
For considerable time the Australian National Committee, and indeed AU.B5 (AU.34), encompassed membership from New Zealand and Papua New Guinea as a "regional" CIGRE presence.

New Zealand eventually established its own National Committee in 2006, however the ANC still support NZ membership in the Australian National Committee and Mirror Panels. NZNC have since established their own NZ.B5 Mirror Panel.

CIDER

The Conference on Integration of Distributed Energy Resources is presented by CIGRE Australia and has been created as a practical forum focusing on the integration of distributed energy resources (DER) from a network perspective.

It aims to facilitate practical conversations and information sharing between utilities, product suppliers and communities about the challenges and opportunities presented by DER to the industry, leading to practical, workable technical solutions for integrating DER into both existing and future electricity networks.



Some of our Conference History

Australian CIGRE National Environment Conference - May, 2011
Sebel and Citigate, Brisbane.

Colloquium - HVDC and Power Electronics: Enhancing the Transmission Networks - 20-21 October, 2011, Brisbane.

SG & WG Melbourne Convention Center SC B4 Study Committee and Working Group Meetings - 15-17 October, 2011, Melbourne.

B4 Study Committee HVDC and Power Electronics - Tutorials 19 October, 2011, Brisbane.

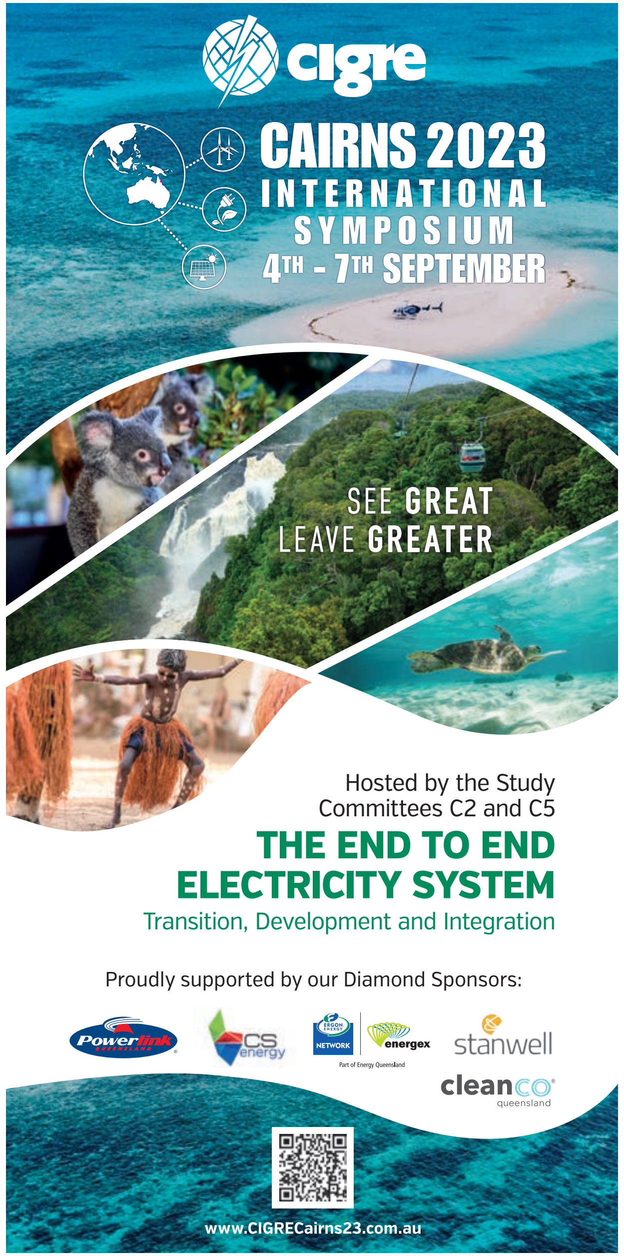
Brisbane Convention Centre 11-13 March, 2013, Brisbane.

Study Committee B3 & D1 - Managing Substations in the Power System of the Future - 8-11th September, 2013
Sofitel, Brisbane.

SEAPAC & CIDER Held every 2 years from 2007 and 2015 respectively.

Celebrating 70 Years of CIGRE Australia - 1953-2023

9th June 2023, Stamford Plaza, Brisbane



Hosted by the **Study Committees C2 and C5.** The theme of the Symposium is:

The End to End Electricity System

Transition, Development, Operation and Integration

KEYNOTE SPEAKERS

Our Keynote Speakers **David Shankey, Adam Middleton** and **Merryn York** will be addressing some of the key issues both in Queensland and from International experience and practice. Don't miss this chance to discuss energy transition issues and challenges with like minded professionals and technical experts.

David Shankey
Deputy Director-General, Energy
Department of Energy and Public Works

Adam Middleton
Vice President
Western Europe
Siemens Energy

Merryn York
Executive General Manager
System Design, AEMO

- ✓ 11 Global Study Committees
- ✓ 55 Local and International Exhibitors
- ✓ 300 + Technical Paper Presentations
- ✓ 7 Tutorials from CIGRE International Study Committees
- ✓ Young Professionals Presentation, Forum & Networking
- ✓ Breakfast Session Hosted by Women in Energy (WiE)
- ✓ SEAPAC + CIDER Events Incorporated
- ✓ Optional Companion Tours
- ✓ Optional Technical Tours on the following Friday
- ✓ Soiree in the Rainforest
- ✓ Newly refurbished, award winning Cairns Convention Centre

GLOBAL STUDY COMMITTEES ATTENDING

A3 — Transmission and Distribution Equipment
B1 — Insulated Cables
B3 — Substations and electrical installations
B5 — Protection and automation
C1 — Power system development and economics
C2 — Power system operation and control
C4 — Power system technical performance
C5 — Electricity markets and regulation
C6 — Active distribution systems and distributed energy resources
D1 — Materials and emerging test techniques
D2 — Information systems and telecommunication

TO SECURE YOUR SPONSORSHIP, CONTACT:
Debbie Haddock (Symposium Organiser)
P: **0418 740 333** | E: **SponsorshipCairns23@CIGREAustralia.org.au** | W: **CIGRECairns23.com.au/sponsorship**

Australian National Committee of CIGRE

The Evolution of CIGRE Logos

Historic

The logo design has rarely changed since 1931. The first one appeared in 1948 with a green colour. The actual logo is still green.

1948-1968

1981-2011

cigré

cigré AUSTRALIA

cigré NGN

2019-2023

cigre For power system expertise

cigre For power system expertise

cigre Australia

cigre Australia

cigre Australia | Next Generation Network

cigre Next Generation Network

cigre Australia | Women in Energy

cigre Women in Energy

First Edition Released in 1931

Electra Publications

1931

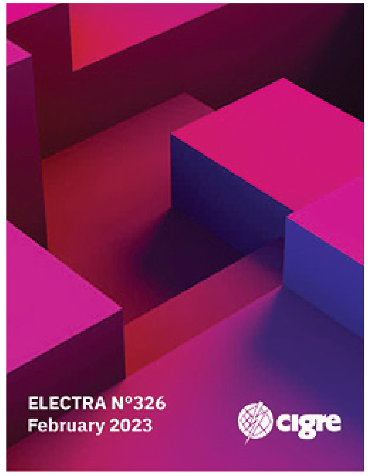
The first "ELECTRA" was created in 1931 and is a collaboration of work from the CIGRE community, which encompasses thousands of professionals from across more than 90 countries, represented by 60 National organisations.

ELECTRA presents technically robust, real world analysis and globally diverse perspectives.

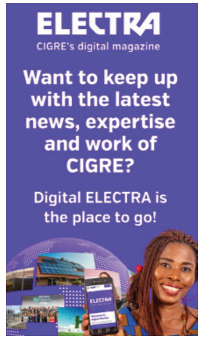
You will find expert articles and thought leadership on many of the issues affecting the global power system today.

New format – ***"ELECTRA 2000"*** was suggested and supported by the Administrative Council in August 2000 and the first issue was published in October the same year. The new format took into account the evolution of the communication means in CIGRE, with the website and the online Bookstore ***"e-cigre"***.

The evolving face of ELECTRA 1931 to 2023



2023



In August 2020 Electra Digital Magazine was released.

Australian National Committee of CIGRE

In the Loop & Corona Times

First Released in June, 2014

"In the Loop" is an email based quarterly "e-news update" aimed at senior industry leaders. Its style is short and to the point and is intended for both technical and non-technical audiences.

Each issue of ***"In the Loop"*** typically features three or four articles from the CIGRE network. These will relate to a range of key areas but, in particular, the top issues identified in consultation with members and industry leaders.


e-News for power industry leaders
Issue 1 - June 2014

IN THE loop

cigre Australia

Welcome to the first edition of our quarterly email news for industry leaders. If you do not wish to receive any further editions, please click the unsubscribe link at the foot of this page.

In the Loop – empowering and informing the industry

A welcome from Doug Aberle, chairman, Cigré Australia. Welcome to 'In the Loop', Cigré Australia's new email-based news update for senior industry leaders. This is the first edition of 'In the Loop', which will be a quarterly publication supported by our new public website and information centre.

MORE >

CIGRE to provide world-class insights for managing ageing substation equipment

CIGRE has undertaken the biggest and most comprehensive global reliability survey ever carried out on HV equipment. The survey represents a service experience of over 280,000 circuit breaker years, 930,000 disconnector earth-switch years, 1.2 million instrument transformer years and 88,000 GIS circuit breaker years. The detailed results are available to Cigré members from e-Cigré in the form of six detailed technical brochures. The survey concluded that ageing is the single largest contributing factor of poor reliability of HV equipment.

MORE >

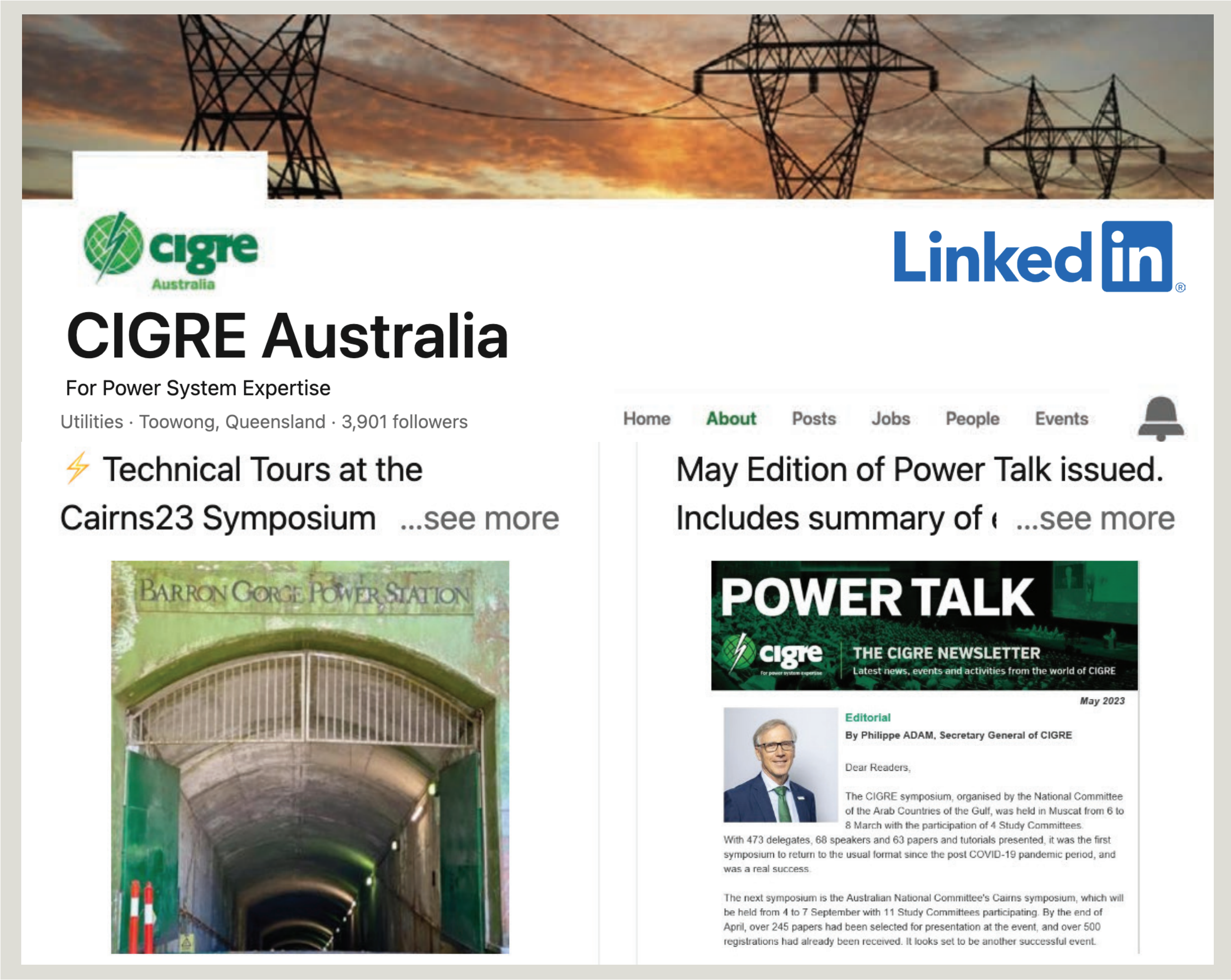
Corona Times Digital News-sheet

In March 2020 CIGRE members were confined to their houses or adhering to severe restraints due to the Global Pandemic of Coronavirus.

It was at this time we created a 'Fortnightly News-sheet' to provide information and updates to CIGRE Members.

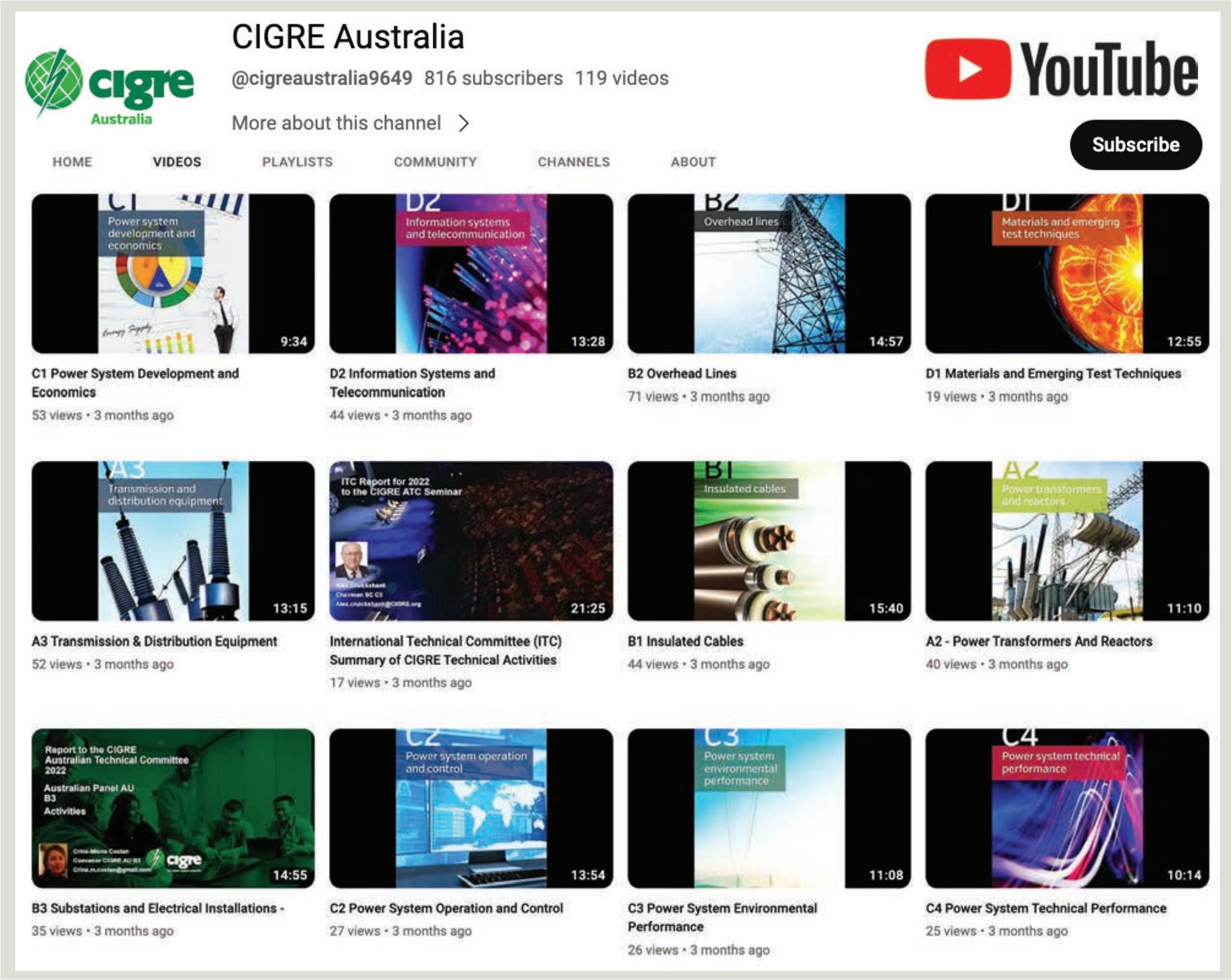
Australian National Committee of CIGRE

Linkedin



Australian National Committee of CIGRE

YouTube



Philip Dulhunty

A Collection of Poems

Over the past 60 years I have been involved in one way or another with CIGRE *(a Collection of Idiots Gathered Round Electricity)*. During this time, I have penned a few lines of verse.

What does CIGRE mean?

Pronounced "sea grey" but nothing to do with sea or grey colour.

It could mean, "A Collection of Idiots Gathered Round Electricity?"

Though that is an appropriate title, it really is French for, Conseil International des Grands Réseaux Électriques, which in English means, International Council for Large Electric Systems.

CIGRE was formed in France when some adjacent countries could generate electricity cheaply and in quantities greater than required, so that power transmission could be sold to other European countries. It was important to ensure that similar voltages and frequencies were used by all countries.

And this also made a universal market for specialised standard materials and equipment.

MARCEL BENSON

There was a young fellow called Benson
in charge of both low and high tension
To our greatest sorrow
he leaves us tomorrow
for reasons we'd better not mention.

A great engineer, Marcel Benson,
I tell you without apprehension
He hasn't been fired
He's only retired
Cos Bev's made him pull down the ensign!

Best of Luck
Merry Christmas
Happy New Year
Long Life and
Double Happiness

In 1998 Harry Holmes of EPT fame enjoyed his 70th birthday so I had to write him a little poem:-

HARRY HOLMES

There's something over which I cannot tarry
A funny feeling in my bones
I know the date
September twenty eight
Was told me by my garden gnomes
For then you've got to celebrate
Or else it's Hara Karri
I remember now, a birthday, for my oldest mate
I think his first names Harry
And his other one is Holmes

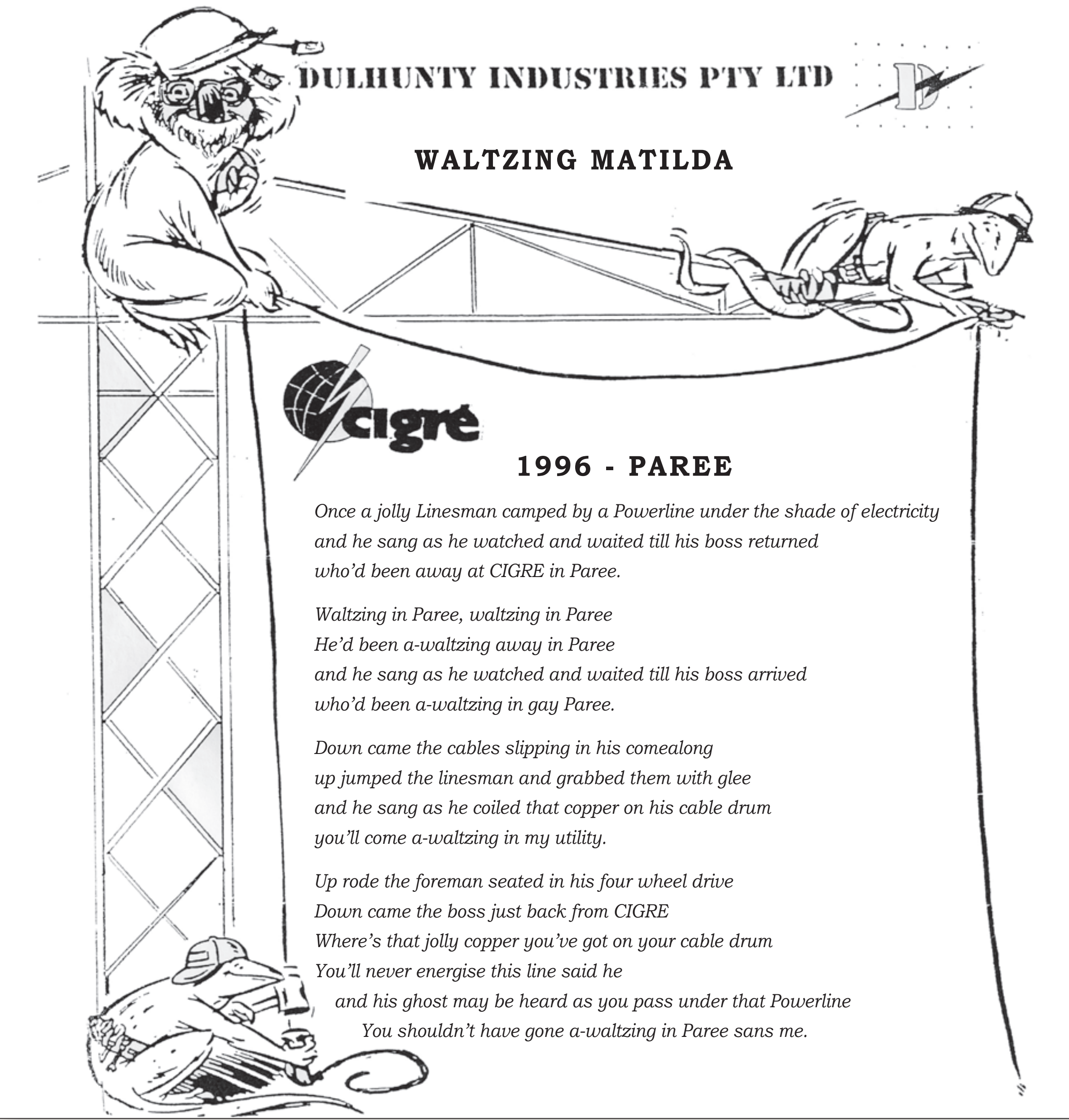
HAPPY 70TH HARRY

Later on Bob Jackson Convenor of AP22 from ECNSW also retired and earned this little ditty:-

BOB JACKSON

There was a young chap called Bob Jackson
Whose nature was quite Anglo-Saxon
No ethics abused
He could ne-er be accused
OF BLOWING HIS OWN BLODDY KLAXON

But Bob has a hidden attraction
That cannot be seen with his DAKS ON
He's got nothing to hide
But deep down inside
There's what makes him the man called BOB JACKSON



DULHUNTY INDUSTRIES PTY LTD

WALTZING MATILDA

cigré

1996 - PAREE

Once a jolly Linesman camped by a Powerline under the shade of electricity
and he sang as he watched and waited till his boss returned
who'd been away at CIGRE in Paree.

Waltzing in Paree, waltzing in Paree
He'd been a-waltzing away in Paree
and he sang as he watched and waited till his boss arrived
who'd been a-waltzing in gay Paree.

Down came the cables slipping in his comealong
up jumped the linesman and grabbed them with glee
and he sang as he coiled that copper on his cable drum
you'll come a-waltzing in my utility.

Up rode the foreman seated in his four wheel drive
Down came the boss just back from CIGRE
Where's that jolly copper you've got on your cable drum
You'll never energise this line said he
and his ghost may be heard as you pass under that Powerline
You shouldn't have gone a-waltzing in Paree sans me.

Interesting Facts

A Very Exclusive Club by Kevin Hesse

There are and have been a number of very exclusive clubs in this world. To be a member of nearly all of them you need to have lots of money or at least power.
I am going to tell you about an extremely exclusive club whose membership was by invitation only and whose members were not required to have money or power – ***the Current Zero Club***.

I became aware of the Current Zero Club when I was involved in the 1970s to the early 1990s with an international organisation known as CIGRE. The name is derived from the initials of the French version of its full title – International Conference for Large Electric Power Systems.

At the time I was involved, countries from around the world were members. Even though the Cold War was going on, there were member countries from both sides of the Iron Curtain. This was remarkable as the aim of the organisation is to share technical knowledge about the planning design and operation of large high voltage power systems. Australia was, and still is, a member.

The main working parts of the CIGRE organisation were a number of Study Committees, each dealing with specific sections of power systems or important plant items e.g. overhead lines, substations, transformers and circuit breakers.

In Australia, there was a local group with people from the major power companies corresponding to each of these Study Committees. The chairmen of these local groups were the Australian representatives on the international Study Committees.
I was a member of the Australian Panel for Switching Equipment for many years in the late 1970 and early 1980s and was the Australian representative on the international Study Committee for Substations from 1984 until 1989.

I became aware of the Current Zero Club when I was a member of the Australian Panel for Switching Equipment and the international Study Committee had its annual meeting in Sydney. One of the members of the Current Zero Club was also a member of the Study Committee and gave a report on the Club's activities to the meeting. The Club was composed of about

8 or 10 members from Universities, other research establishments and circuit breaker manufacturers who were studying the physical phenomena taking place in circuit breakers (or switches) around the time of current zero.

What is this mysterious "current zero"?

All major power systems in the world use what is termed an "alternating current" or AC system. That means that the voltage and current in the system alternate between positive and negative polarity. The voltage and current rise from zero to a positive peak and then decline through zero to a negative peak and then back to zero and the cycle starts again.

In Australia, the frequency of this alternation is 50 times per second. Switches or circuit breakers use the zero current parts of the cycles to interrupt the current by drawing two electrodes apart so that the current does not re-establish its flow after it passes a zero value.

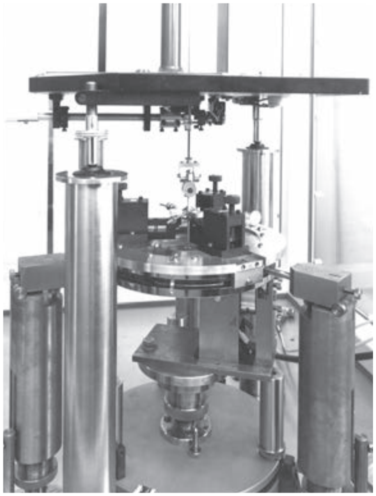
During the 1970s and 1980s there was great interest in making circuit breakers that could break higher and higher currents in faster and faster times. This interest was fuelled by the growth of power usage and interconnected power systems and the consequent need to interrupt larger currents in faster times to preserve the stability of the power systems.

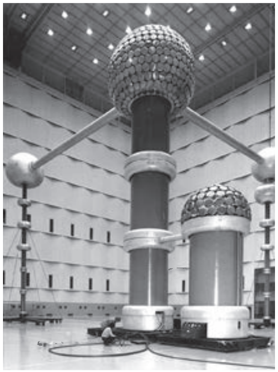
The members of the Current Zero Club were mostly from Europe although there was a Japanese member. These people met and communicated about their research directions and findings although we could surmise that they were cautious about how much they revealed because of the commercial value of any outstanding breakthroughs in knowledge. However, when I spoke to one of the members of the club he said that the real commercial value was in taking the scientific knowledge and applying it to the design of hardware that would break higher currents in a faster time. He also said that the science would become known by all in time and the ability to be ahead of competitors lay in continued research and development.

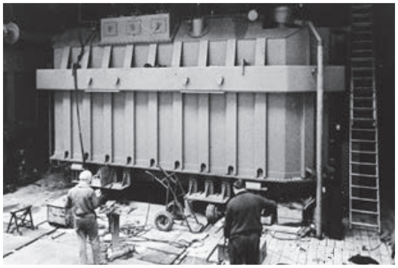
Membership of the Current Zero Club was by invitation only. To receive an invitation, you had to be not only carrying out research into the physical processes occurring around current zero but also to be at the cutting edge of that research.

Most people would not want to be a member of this club. They would not understand what the members were talking about and would be bored by their conversation but the members were very passionate about and committed to their work.

Research and discussion about such very specialized and narrow fields of scientific enquiry help to advance our way of life. You may not want an invitation to join such a club but it is fortunate that some capable people would.







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