THE HONG KONG INSTITUTION OF ENGINEERS
香港工程師學會

Electrical Division
電機分部

The HKIE Electrical Division 40th Anniversary Special Publication

40 Electrical Division

Anniversary 程心E重薪火相傳

Nurturing Our Young for Electrical Engineering

June 2018

The Hong Kong Institution of Engineers Electrical Division 40th Anniversary Special Publication

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Contents

The HKIE Electrical Division
Facebook Page

Welcome Message

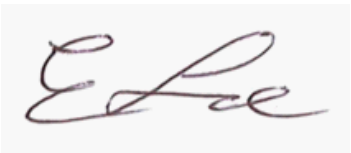
I am delighted to be welcoming you to this Special Publication for the 40th Anniversary of the Electrical Division of HKIE.

Forty years is a major milestone. It is a very special occasion to celebrate – an opportunity to momentarily look back but also a golden ticket to chart the path forward. Hence, in this Special Publication, we have a number of articles to record the signature events of our Division, such as the annual symposiums, annual overseas technical visits, various technology competitions for different levels of students, Professional Short Courses, as well as our great publication of "EE筆寫" produced in 2006. All of these are the wonderful results from the efforts of previous and current Committees of the Division.

This Special Publication also documented special activities held particularly for our 40th Anniversary Celebration, such as the Launching Ceremony, Photography, Chinese Calligraphy, English Paper and Dragon Boat Competitions. More importantly, we are most grateful to receive the congratulatory messages, from a number of key stakeholders in the Electrical Engineering Industry, highlighting our Division major contributions for the past four decades. The publication also included some experience sharing papers from a number of highly qualified engineers, echoing our theme of the 40th Anniversary Celebration – Nurturing Our Young for Electrical Engineering程心E重薪火相傳.

The successful completion of this Special Publication could not be achieved without the great effort from all the contributors and helpers. I would like to thank all of them sincerely. Specifically I would like to express true gratitude to Ir Dr FC Chan, he is not only the main editor of this Special Publication, but also the main driving force behind all these activities of this year-long anniversary celebration event.

I also would like to take this opportunity to wish the Electrical Division to have many more successful years to come. Enjoy reading this Special Publication!



Ir Dr Edward LO
Chairman 2017/18
Electrical Division, The Hong Kong Institution of Engineers

香港房屋委員會
Hong Kong Housing Authority

Congratulatory Message

It is my pleasure to extend my warmest congratulations to the Hong Kong Institution of Engineers (HKIE) Electrical Division on its 40th anniversary.

Over decades, the HKIE Electrical Division has provided an excellent platform for members to share their insights and conduct fruitful dialogues on latest technologies on electrical engineering.

The Division has been striving to sustain excellence in engineering profession through publication of journals and technical papers, and organisation of workshops, conferences and experience sharing programmes. Members are well equipped and stand ready to serve the society. The Division has made significant contribution to the advancement and betterment of Hong Kong.

I wish the HKIE Electrical Division and all its members every success in the years to come.

Ms Connie K Y YEUNG
Deputy Director of Housing
(Development and Construction)

建築署
Architectural Services Department

Congratulatory Message

I am pleased to offer my warmest congratulations to the Electrical Division of the Hong Kong Institution of Engineers (HKIE) on its 40th Anniversary.

Over the past decades, the HKIE Electrical Division has taken up the mission to promote the advancement of electrical engineering and provide an effective platform for industry stakeholders to exchange ideas, to keep abreast of the latest development in the field and to explore collaboration opportunities.

Electrical engineers play an important role in the design, operation and maintenance of building and infrastructure projects in modern society. Under the theme of "Nurturing Our Young for Electrical Engineering" this year, the Division organizes a series of activities to boost public awareness of the positive ways in which electrical engineering interacts with our daily lives and cultivate the interests of the younger generation in the profession.

Achievements in the past four decades lay a firm foundation for further growth. I am confident that the HKIE Electrical Division will continue to uphold its professional excellence and scale new heights in the years ahead.

Mrs Sylvia LAM
Director of Architectural Services

機電工程署
EMSD

Congratulatory Message

It gives me great pleasure to send my warmest congratulations to the HKIE Electrical Division on her 40th anniversary.

When electricity was first discovered via a series of natural and physical phenomena, it was nothing but a mysterious force of nature in people's minds. Ever since the 18th century, our knowledge about electricity has grown at a staggering rate. Thanks to the ingenuity and effort of electrical engineers, electricity has been put to use in a wide array of applications. The potential of electricity has been unleashed and it is now an indispensable part of our daily lives.

The HKIE Electrical Division has made significant contributions to enhancing the standard of and recognition for the electrical engineering profession in the past four decades. In so doing, the electrical engineers have provided the impetus for Hong Kong to develop into a world-class city. I have every faith that the Division will carry on with the mission to bring the profession to a higher level, and to help shape our city into a smarter and more sustainable one.

Ir SIT Wing-hang, Alfred
Director of Electrical and Mechanical Services
The Government of the Hong Kong Special Administrative Region

Congratulatory Message

It is with great pleasure to contribute this message to the HKIE Electrical Division on the happy occasion of its 40th anniversary.

Electrical engineers play an important role to support the city's development and every aspect of our lives. Not only do they contribute in the design, construction, commissioning and subsequent operation and maintenance of the electrical systems for infrastructures that enable Hong Kong to be a modern metropolitan, but they also ensure the reliable operation of electrical services ranging from power supply, public transportation to the electrical installations in buildings where we work or live in.

Over the past four decades, the HKIE Electrical Division has upheld its mission to promote the advancement of electrical engineering and support the engineering profession. Through a wide range of activities, members are able to keep pace with technological development and enhance their engineering competencies. In addition, the Division steps up to safeguard public interest by offering professional advice to the Government on electricity related issues.

In a rapidly-changing world, the industry depends upon expertise, innovation, and the ability to nurture talented individuals who can drive our industry forward. In this connection, the Division is committed to nurturing young talents for the electrical engineering profession. Since the early 1990s, various competitions and activities have been organised to inspire youngsters in innovation, and enlighten them to pursue the career in this meaningful industry.

I wish to express again my gratitude to the HKIE Electrical Division for its significant contribution to the industry as well as to the Hong Kong's society. I look forward to seeing the Division continuing to scale new heights in the years ahead.

Ir CHIANG Tung-keung
Managing Director
CLP Power Hong Kong Limited

Congratulatory Message

On behalf of HK Electric, I would like to congratulate the HKIE Electrical Division on its 40th anniversary.

Over the years, the HKIE Electrical Division has been an unrelenting force in the pursuit of excellence by providing industry participants with a platform for training, benchmarking and experience sharing. We at HK Electric have always placed great emphasis on enhancing engineering capabilities of our staff as well as developing and nurturing of young talents. The highly commendable efforts by your Division have contributed tremendously to the community, earning respect and recognition from the engineering sector and the public at large.

With electrical engineering playing an increasingly important role in Hong Kong's development into a smart city, we are confident that your Division will continue to support various disciplines from power generation and utilization, electrified transportation systems, intelligent buildings, to industrial control and automation.

Once again, my heartfelt congratulations for the remarkable achievements over the last four decades and our best wishes for your Division as it helps herald a new era of smart living in Hong Kong.

Ir WAN Chi-tin
Managing Director
The Hongkong Electric Co., Ltd.

Congratulatory Message

Over the past decades, Electrical Engineers have played a critical role in engineering efficient infrastructures to transform Hong Kong into the world-class city it is today.

I would like to take this opportunity to congratulate the Division's continual contribution to the welfare and development of Hong Kong's infrastructure.

I am certain that the role of electrical engineers will become increasingly important as they are empowered to address key sustainability issues through engineering solutions. I look up to the Electrical Division to nurture new talents and to bring synergies in embracing these challenges, driving Hong Kong to become a smarter and more pleasantly-living city.

Once again, I would like to express my heartfelt gratitude and congratulate the Electrical Division for reaching this unique milestone. I wish for its ever-growing success in the future.

Ir Dr Philco WONG
Projects Director
MTR Corporation Limited

Sustainable Electrical Engineering: Towards A New Horizon

Founding and Evolution

The HKIE Electrical Division was formed in 1978 as one of the six founding divisions of the HKIE. The founding Chairman was Ir Prof W S Leung and he led the Division during the first two sessions from 1978 to 1980. The Committee Members of the founding session were Ir Prof W S Leung, Ir Dr L H Lees, Ir R W Bryant, Ir James Chiu, Ir Dr C M Ko, Ir George Ralph, Ir C K Windle, Ir Dominic K W Yiu and Ir Anthony Y K Chan. Under the umbrella of the HKIE, the mission of the Division was:

(a) To promote the advancement of electrical engineering and to facilitate the exchange of information and ideas;

(b) To provide a broad range of services to members, to assist them in developing in their careers by improving their capabilities as engineers and to play their full part in contributing to the community;

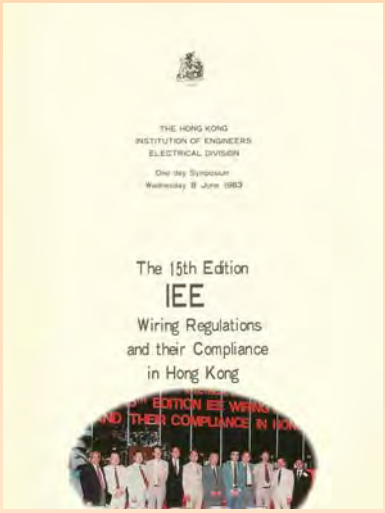
(c) To raise the standing and visibility of the profession and maintain a high standard of professional conduct

During the early years of operation, funding for the Division was limited. The major activities organised were technical seminars and local technical visits. Technical seminars were normally held in educational institutes on weekday evenings while technical visits were organised on Saturday mornings. These learned society activities competed with other renowned overseas institutions like IEE of the UK and IEEE of the US which had representatives or sections already established in Hong Kong.

The major breakthrough in terms of the Division's activities was the organisation of the first annual symposium in 1983 with sponsorship from local engineering organisations. The annual symposium not only fulfilled the prime purpose of knowledge dissemination but also became a major source of funding for the Division, its surplus enabling it to further develop and expand its learned society activities. We are therefore most grateful to all our sponsors for their unfailing support over the past decades, which has kept the Division financially healthy and helped it to fulfil its stated mission in a stable manner.

Milestones and Development

The launch of the Division's annual symposium is a key milestone. The event has been held annually since 1983 to promote the advancement of electrical engineering and facilitate the exchange the ideas and knowledge. The most recent one, the 35th Annual Symposium, was held on 12 October 2017. The title of the first symposium in 1983 was "The (15th Edition) IEE Wiring Regulations and their compliance in Hong Kong".



Overseas and mainland technical visits were organised every year. The first overseas visit was organised during the 1989-1990 Session while the first Mainland visit was organised during the 1984-1985 Session. Again, these visits were regularly organised every year with an average of 30 participants per visit.

The International Conference on Electrical Engineering (ICEE) aims to provide a forum for sharing knowledge, experience and creative ideas among worldwide electrical engineers. Since 1995, ICEE has been successfully held annually. This conference is basically organised by four institutions; namely, the HKIE, the Chinese Society of Electrical Engineering, Institute of Electrical Engineers of Japan and the Korean Institute of Electrical Engineers, each of which takes its turn to host the event once every four years. The organisation and management of the conference held in Hong Kong is led by the Division, representing the HKIE. Our Institution hosted the conference in Hong Kong in 1999, 2003, 2007, 2011 and 2015. The Division contributed significantly to the management and operation of the conferences, which brought an accumulative surplus of over HK$800,000 for the HKIE. Even in 2003, when the conference was affected by the outbreak of the SARS epidemic, we were still able to achieve a surplus of HK$10,000.

The Division contributed short articles to introduce basic concepts and explain electrical engineering through a column in our Institution's magazine, Hong Kong Engineer, from October 2006 to June 2014. During these nearly eight years, 91 'Electrical Blog' articles were contributed by the Division.

The Division was a pioneer in the promotion of electrical engineering to secondary schools. The "Project Competition on Electrical Science" was first started in 1992 to raise the awareness of students of the contributions of electrical engineering to the prosperity of our society. This competition was co-organised with the Education Bureau with sponsorship from the power utilities. Similar competitions with slightly different themes have been held annually since 1992.

The Division, after establishing its healthy and prudent expenditure, supported the HKIE Building Fund by donating HK$250,000. This 'big' cheque was presented to the President Ir Barry Stubbings at the HKIE 50th Anniversary cocktail reception on 27 February 1997. When the HKIE expanded its Headquarters to 21/F of Island Beverley in early 2016, the Division also contributed HK$100,000 towards this additional property purchase.

To disseminate technical knowledge and promote electrical engineering, a book written in Chinese titled "EE筆寫" was published in October 2006 with a quantity of 5,000. More than 700 copies of it were sold in T H Lee Book Co Ltd. It also attracted media coverage with articles introducing the book as well as the profession of electrical engineering. We believe some secondary school students were inspired to join the electrical engineering profession by this book.

The Division regularly provides views on government consultation papers. One important contribution from the Division was our expert views on electricity in Hong Kong and the upgrading of supply voltage from 346V to 380V in early 1990. Practical tests to ascertain plant and appliance efficiency were carried out with results supporting the required voltage upgrade. Similarly, the Division supported the cable colour code for fixed electrical installations to be changed from red/yellow/blue/black to the new brown/black/grey/blue to align with the latest international standard. The change was fully implemented on 1 July 2007.

To enhance communication and promote electrical engineering, the Division produced a video in early 2000 and distributed it to secondary schools. This video was updated in 2009 and now can be viewed on YouTube (*https://youtu.be/FF0U-PKP7ng*). The Division built its standalone website in 2004 and the website was subsequently integrated with the HKIE's institutional website. In October 2017, the Division established a Facebook page to promote electrical engineering activities which can be accessed via the link: *https://www.facebook.com/HKIE-Electrical-Division-1399340883466531/*

Building a good foundation for the Division requires good cooperation with industry stakeholders.

Their sponsorships support the development and communication of technology advancements (not product sales talks) so that our engineers, through the effective use of technology, can enhance the living quality of our society.

New Horizon

To celebrate 40 years of its establishment, the Division will organise a series of activities under the theme "Nurturing Our Young for Electrical Engineering" (程心E重薪火相傳), to boost public awareness of the positive ways in which electrical engineering interacts with our daily life. A launching ceremony for the Division's 40th anniversary celebrations was held on 12 October 2017. For sustainable development of the profession, we need to focus on the younger generation by stimulating their interests and participation in the electrical engineering world.

The Division has the following new horizon in mind for future development:

(a) Strengthen promotional activities for secondary school students, especially in the lower forms;
(b) Enhance membership activities to provide up-to-date technologies via more timely technical talks, professional short courses and various technical visits;
(c) Intensify cooperation with other professional institutes and industry, to share the effort and execute more effective ways to promote the image of electrical engineers.

The above article, published in Hong Kong Engineer in Jan 2018, was written by Ir Dr FC Chan. It provides a summary of the HKIE Electrical Division evolution and development for the part 40 years. The following detailed list of historical data is a precious record about the Division.

HKIE Electrical Division
List of Historical Documents

1. Committee List of the HKIE Electrical Division from 1978-2018
2. List of Electrical Blog published in Hong Kong Engineer during October 2006 to June 2014
3. List of Annual Symposiums organised by the HKIE Electrical Division during 1983 to 2018
4. List of Factories Visited during HKIE Electrical Division Overseas Technical Visits in 1990 - 2017
5. List of Mainland Visits in 1999 - 2017

HKIE Electrical Division
List of 40th Anniversary Celebration Events

1. Launching Celebration
2. Photo Competition
3. Paper Competition
4. Chinese Calligraphy Competition
5. Electrical Model Design Contest
6. Energy Innovation for Smart City Project Competition
7. Articles for experience sharing
8. 40th Anniversary Celebration Dinner

Committee List of the HKIE Electrical Division from 1978-2018

Session 1978/1979
Prof WS LEUNG (Chairman)
Dr LH LEES (Vice Chairman)
RW BRYANT
James CHIU
Dr CM KO
George RALPH
CJ WINDLE
Dominic KW YIU
CHAN Yuet Keung, Anthony

Session 1979/1980
Prof WS LEUNG (Chairman)
Dr LH LEES (Vice Chairman)
T RAO (Hon Secretary)
RW BRYANT
James CHIU
Dr CM KO
George RALPH
CJ WINDLE
Dominic KW YIU
CHAN Yuet Keung, Anthony

Session 1980/1981
Dr LH LEES (Chairman)
CJ WINDLE (Vice Chairman)
CS CHANG (Hon Secretary)
YC TONG
Prof WS LEUNG
T RAO
JR DEVEREUX
C MIAO
James CHIU
Dr CM KO
George RALPH
MC LAU
PK KWOK

Session 1981/1982
Dr CM KO (Chairman)
James CHIU (Vice Chairman)
C MIAO (Hon Secretary)
JR DEVEREUX
PK KWOK
MC LAU
Dr LH LEES
Prof WS LEUNG
IJ McKELVIE
George RALPH
T RAO
CJ WINDLE
YC TONG
CS CHANG
Dominic KW YIU
WM TSANG

Session 1982/1983
James CHIU (Chairman)
Dr CM KO (Immediate Past Chairman)
C MIAO (Vice Chairman)
YC TONG (Hon Secretary)
R BRAY
IJ McKELVIE
AD LONGMORE
CT CHOY
Dr LH LEES
D THORNBER
CS CHANG
T RAO
JR DEVEREUX
MC LAU
TH TAI

Session 1983/1984
C MIAO (Chairman)
James CHIU (Immediate Past Chairman)
YC TONG (Vice Chairman)
MC LAU (Hon Secretary)
IJ McKELVIE
AD LONGMORE
CT CHOY
Dr LH LEES
CS CHANG
T RAO
JR DEVEREUX
Simon SO HO
WK LEE
TH TAI
KW LEUNG

Session 1984/1985
YC TONG (Chairman)
C MIAO (Immediate Past Chairman)
MC LAU (Vice Chairman)
Simon SO HO (Hon Secretary)
CS CHANG
CT CHOY
JR DEVEREUX
WK LEE
AD LONGMORE
IJ McKELVIE
T RAO
ST TAM
James CHIU
SK AU YEUNG
KS NG
TH TAI
KW LEUNG
WM HO

Session 1985/1986
MC LAU (Chairman)
YC TONG (Immediate Past Chairman)
AD LONGMORE (Vice Chairman)
Simon SO HO
ST TAM (Hon Secretary)
SK AU YEUNG
CS CHANG
JR DEVEREUX
WK LEE
IJ McKELVIE
KS NG
T RAO
CC CHAN
KT CHAN
C MIAO
SK TSO
Peter YS WONG
HO Sai-king
KW LEUNG
WM HO
YK CHU

Session 1986/1987
Simon SO HO (Chairman)
MC LAU
ST TAM
WK LEE
SK AU YEUNG
KT CHAN
CC CHAN
CS CHANG
LY CHEUNG
YC TONG
SK TSO
AD LONGMORE
T RAO
Peter YS WONG
WS CHAN
YW LEE
HO Sai-king
YK CHU
KW LEUNG
WM HO/PF CHAN

Session 1987/1988
AD LONGMORE (Chairman)
Simon SO HO (Immediate Past Chairman)
ST TAM (Vice Chairman)
LY CHEUNG (Hon Secretary)
SK AU YEUNG
KT CHAN
CC CHAN
CS CHANG
MC LAU
WK LEE
T RAO
YC TONG
SK TSO
Peter YS WONG
YW LEE
WS CHAN
HO Sai-king
TH TAI
PF CHAN
YK CHU

Session 1988/1989
ST TAM (Chairman)
AD LONGMORE (Immediate Past Chairman)
LY CHEUNG (Vice Chairman)
CC CHAN (Hon Secretary)
KT CHAN
CS CHANG
Simon SO HO
PH HO
MC LAU
WK LEE
Otto POON
T RAO
DKY WONG
HO Sai-king
TH TAI
Peter YS WONG
YK CHU

Session 1989/1990
LY CHEUNG (Chairman)
ST TAM (Immediate Past Chairman)
CC CHAN (Vice Chairman)
PH HO (Hon Secretary)
AD LONGMORE
CS CHANG
Otto POON
Peter YS WONG
DKY WONG
CK TSANG
CY CHAN
WK TANG
HO Sai-king
TH TAI
Edward YH YEUNG
S KUM
YK CHU

Session 1990/1991
CC CHAN (Chairman)
LY CHEUNG (Immediate Past Chairman)
PH HO (Vice Chairman)
WK TANG (Hon Secretary)
Peter YS WONG
Otto POON
CK TSANG
DKY WONG
CY CHAN
TH TAI
HO Sai-king
Edward YH YEUNG
S KUM
KL NG
KA OLDFIELD
ST TAM
WM HO
YK CHU
CL WONG

Session 1991/1992
PH HO (Chairman)
CC CHAN (Immediate Past Chairman)
Otto POON (Vice Chairman)
DKY WONG (Hon Secretary)
Peter YS WONG
CK TSANG
KL NG
SS YUEN
WK TANG
KA OLEFILED
Simon KUM
Edward YH YEUNG
TH TAI
WH WONG
HO Sai-king
YK CHU
CL WONG

Session 1992/1993
Otto POON (Chairman)
PH HO (Immediate Past Chairman)
Peter YS WONG (Vice Chairman)
DKY WONG (Hon Secretary)
TH TAI (Hon Treasurer)
CC CHAN
HO Sai-king
Simon KUM
Dr Mark MacALPINE
WK TANG
CK TSANG
Edward YH YEUNG
David YUEN
WH WONG
YK CHU
CL WONG
WT WONG
Vincent KW TONG

Session 1993/1994
Peter YS WONG (Chairman)
Otto POON (Immediate Past Chairman)
DKY WONG (Vice Chairman)
David YUEN (Hon Secretary)
TH TAI (Hon Treasurer)
WK TANG
HO Sai-king
Dr Mark MacALPINE
Simon KUM
Edward YH YEUNG
KW TONG
SS YUEN
WH WONG
Dr Bryan MH PONG
YK CHU
CL WONG
YEUNG Kwok Keung
Grace TT CHUNG
WONG Kwok Po

Session 1994/1995
David CM YUEN (Chairman)
Peter YS WONG (Immediate Past Chairman)
KW TONG (Vice Chairman)
Simon KUM (Hon Secretary)
HO Sai-king (Hon Treasurer)
PM CHENG
YK CHU
Dr Mark MacALPINE
Joseph CM LEUNG

Dr Bryan MH PONG
WK TANG
Vincent WS TONG
Edward YH YEUNG
SS YUEN
WH WONG
TH TAI
CL WONG

Session 1995/1996

Ir KW TONG (Chairman)
Ir David CM YUEN (Immediate Past Chairman)
Ir Simon SM KUM (Vice Chairman)
Ir Vincent WS TONG (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir PM CHENG
Ir YK CHU
Ir Dr Mark MacALPINE
Ir Joseph CM LEUNG
Ir Dr Bryan MH PONG
Ir TH TAI
Ir Edward YH YEUNG
Ir SS YUEN
Ir WH WONG
Ir Peter YS WONG
Ir Dr FC CHAN

Session 1996/1997

Ir Simon SM KUM (Chairman)
Ir KW TONG (Immediate Past Chairman)
Ir Vincent WS TONG (Vice Chairman)
Ir WH WONG (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir David CM YUEN
Ir YK CHU
Ir Dr Mark MacALPINE
Ir Joseph CM LEUNG
Ir Dr Bryan MH PONG
Ir TH TAI
Ir Edward YH YEUNG
Ir SS YUEN
Ir Dr FC CHAN
Ir Leonard CP LEE
Ir Peter YS WONG
Ir Onnal Fu-lam HO
Ir Grace TT CHUNG
Ir PM CHENG

Session 1997/1998

Ir WH WONG (Chairman)
Ir Simon SM KUM (Immediate Past Chairman)
Ir Vincent WS TONG (Vice Chairman)
Ir SS YUEN (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir KW TONG
Ir David CM YUEN
Ir YK CHU
Ir Dr Mark MacALPINE
Ir Peter YS WONG
Ir PN IP
Ir TP UY
Ir Joseph CM LEUNG
Ir Dr Bryan MH PONG
Ir TH TAI
Ir Edward YH YEUNG
Ir Dr FC CHAN
Ir Leonard CP LEE
Ir CL WONG
Ms Grace TT CHUNG
Ir PM CHENG
Mr SW TANG
Ir Frank KL NG (Co-opted Member)
Ir KK FUNG (Co-opted Member)

Session 1998/1999

Ir Vincent WS TONG (Chairman)
Ir WH WONG (Immediate Past Chairman)
Ir SS YUEN (Vice Chairman)
Ir Leonard CP LEE (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir David CM YUEN
Ir YK CHU
Ir Dr Bryan MH PONG
Ir Joseph CM LEUNG
Ir TF CHAN
Ir Edward YH YEUNG
Ir Dr FC CHAN
Ir Leonard C P LEE
Ir KK FUNG
Ir Frank KL NG
Ms Grace TT CHUNG
Mr SW TANG
Ir PM CHENG
Ir PN IP
Ir TP UY

Session 1999/2000

Ir SS YUEN (Chairman)
Ir Vincent WS TONG (Immediate Past Chairman)
Ir Leonard CP LEE (Vice Chairman)
Ir Dr FC CHAN (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir David CM YUEN
Ir TF CHAN
Ir Edward YH YEUNG
Ir TP UY
Ir YK CHU
Ir Frank KL NG
Ir KK FUNG
Ir PN IP
Ir Joseph CM LEUNG
Ir TH TAI (Co-opted Member)
Ir Daniel LEE (Co-opted Member)
Ir Dr Edward WC LO

Session 2000/2001

Ir Leonard CP LEE (Chairman)
Ir SS YUEN (Immediate Past Chairman)
Ir Dr FC CHAN (Vice Chairman)
Ir TP UY (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir David CM YUEN
Ir TF CHAN
Ir Edward YH YEUNG
Ir Joseph CM LEUNG
Ir YK CHU
Ir Frank KL NG
Ir KK FUNG
Ir PN IP
Ir TH TAI
Ir Vincent WS TONG
Ir WK LEE (Co-opted Member)
Ir WC CHENG (Co-opted Member)

Session 2001/2002

Ir Dr FC CHAN (Chairman)
Ir Leonard CP LEE
Ir TP UY (Vice Chairman)
Ir Joseph CM LEUNG (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir David CM YUEN
Ir Dr Edward WC LO
Ir Edward YH YEUNG
Ir WK LEE
Ir YK CHU
Ir Frank KL NG
Ir KK FUNG
Ir PN IP
Ir TH TAI
Ir CL WONG
Ir CS HO
Ir Michael MF WAYE
Ir David TW CHAN (Co-opted Member)
Ir WC CHENG (Co-opted Member)
Ir A Kumar DAVID (Co-opted Member)

Session 2002/2003

Ir TP UY (Chairman)
Ir Dr FC CHAN (Immediate Past Chairman)
Ir Joseph CM LEUNG (Vice Chairman)
Ir PN IP (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir WC CHENG
Ir YK CHU
Ir KK FUNG
Ir CS HO
Ir WK LEE
Ir Dr Edward WC LO
Ir Frank KL NG
Ir TH TAI
Ir CL WONG
Ir Edward YH YEUNG
Ir David CM YUEN
Ir KM YUNG
Ir Leonard CP LEE (Ex-Off Div Council Rep)
Ir SS YUEN (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ms Denise KY LO (Ex-Off YMC Rep)
Ir David TW CHAN (Co-opted Member)
Ir Eric CH CHUI (Co-opted Member)
Ir Gary CW KO (Co-opted Member)

Session 2003/2004

Ir Joseph CM LEUNG (Chairman)
Ir TP UY (Immediate Past Chairman)
Ir PN IP (Vice Chairman)
Ir TH TAI (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir Dr FC CHAN
Ir Frank KL NG
Ir YK CHU
Ir Dr Edward WC LO
Ir David CM YUEN
Ir WK LEE
Ir CL WONG
Ir KM YUNG
Ir CS HO
Ir Gary CW KO
Ir Prof KP WONG
Ir Henry HC LAM
Ir Leonard CP LEE (Ex-Off Div Council Rep)
Ir SS YUEN (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ms Denise KY LO (Ex-Off YMC Rep)
Ir Geoffrey L CHAN (Co-opted Member)
Ir Eric CH CHUI (Co-opted Member)
Ir Daniel TSOI (Co-opted Member)

Session 2004/2005

Ir PN IP (Chairman)
Ir Joseph CM LEUNG (Immediate Past Chairman)
Ir TH TAI (Vice Chairman)
Ir Prof KP WONG (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir Dr FC CHAN
Ir Frank KL NG
Ir YK CHU
Ir Dr Edward WC LO
Ir Eric CH CHUI
Ir WK LEE
Ir CL WONG
Ir KM YUNG
Ir CS HO
Ir Gary CW KO
Ir Geoffrey L CHAN
Ir Henry HC LAM
Ir TP UY (Ex-Off Div Council Rep)
Ir WH WONG (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ms Mandy MY MY LEUNG (Ex-Off YMC Rep)
Ir Dr Joe WN LAU (Co-opted Member)
Ir Simon FW CHUNG (Co-opted Member)

Session 2005/2006

Ir TH TAI (Chairman)
Ir PN IP (Immediate Past Chairman)
Ir Prof KP WONG (Vice Chairman)
Ir KM YUNG (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir Dr FC CHAN
Ir Frank KL NG
Ir YK CHU
Ir Dr Edward WC LO
Ir Eric CH CHUI
Ir WK LEE
Ir CL WONG
Ir CS HO
Ir Gary CW KO
Ir Geoffrey L CHAN
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Mr Indi WF WONG (Ex-Off AMC Rep)
Ms Mandy MY MY LEUNG (Ex-Off YMC Rep)
Ir Dr Joe WN LAU (Co-opted Member)
Ir Dr KM LEUNG (Co-opted Member)

Session 2006/2007

Ir Prof KP WONG (Chairman)
Ir TH TAI (Immediate Past Chairman)
Ir KM YUNG (Vice Chairman)
Ir Gary CW KO (Hon Secretary)
Ir HO Sai-king (Hon Treasurer)
Ir Geoffrey L CHAN
Ir YK CHU
Ir Eric CH CHUI
Ir Simon FW CHUNG
Ir CS HO
Ir Henry HC LAM
Ir Dr Joe WN LAU
Ir WK LEE
Ir Dr KM LEUNG
Ir Dr Edward WC LO
Ir Frank KL NG
Ir CL WONG
Ir Dr FC CHAN (Ex-Off Div Council Rep)
Ir WH WONG (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Mr Stephen CK YIP (Ex-Off YMC Rep)
Ir PK CHAN (Co-opted Member)
Ir Gordon MS WOO (Co-opted Member)

Session 2007/2008

Late Ir KM YUNG / Ir Gary CW KO* (Chairman)
Ir Prof KP WONG (Immediate Past Chairman)
Ir Gary CW KO# / Ir HO Sai-king* (Vice Chairman)
Ir HO Sai-king# / Ir Simon FW CHUNG* (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir Geoffrey L CHAN
Ir PK CHAN
Ir Eric CH CHUI
Ir Simon FW CHUNG#
Ir CS HO
Ir Henry HC LAM
Ir Dr Joe WN LAU
Ir WK LEE
Ir Dr KM LEUNG
Ir Frank KL NG
Ir Gordon MS WOO
Ir Edward YH YEUNG
Ir Dr FC CHAN (Ex-Off Div Council Rep)

Ir Stephen CHAN (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Mr Ken TK CHAN (Ex-Off YMC Rep)
Ir Dr Edward WC LO (Co-opted Member)
Ir Albert WK TO (Co-opted Member)
Ir CL WONG (Co-opted Member)
(The member in * took up # marked role in Nov 2007)

Session 2008/2009

Ir HO Sai-king (Chairman)
Ir Gary CW KO (Immediate Past Chairman)
Ir Simon FW CHUNG (Vice Chairman)
Ir Geoffrey L CHAN (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir PK CHAN
Ir Eric CH CHUI
Ir CS HO
Ir Henry HC LAM
Ir Dr Joe WN LAU
Ir WK LEE
Ir Dr KM LEUNG
Ir Frank KL NG
Ir Albert WK TO
Ir Gordon MS WOO
Ir Edward YH YEUNG
Ir TH TAI (Ex-Off Div Council Rep)
Ir Stephen HC CHAN (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ir Mandy MY LEUNG (Ex-Off YMC Rep)
Ir YH CHAN (Co-opted Member)
Ir Morris SW CHEUNG (Co-opted Member)
Ir Dr Edward WC LO (Co-opted Member)

Session 2009/2010

Ir Simon FW CHUNG (Chairman)
Ir HO Sai-king (Immediate Past Chairman)
Ir Geoffrey L CHAN (Vice Chairman)
Ir Dr KM LEUNG (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir PK CHAN
Ir Eric CH CHUI
Ir CS HO
Ir TAM Wing Shing
Ir HO Siu Kwong
Ir WK LEE
Ir Morris SW CHEUNG
Ir Dr Edward WC LO
Ir Albert WK TO
Ir Gordon MS WOO
Ir Edward YH YEUNG
Ir CHAN Yiu Hon
Ir CL WONG
Ir Dr Edward WC LO (Ex-Off Div Council Rep)
Ir Stephen HC CHAN (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ir Ken TK CHAN (Ex-Off YMC Rep)
Ir Gary CW KO (Co-opted Member)
Ir Kenny CM CHAN (Co-opted Member)
Ir YK CHU (Co-opted Member)

Session 2010/2011

Ir Geoffrey L CHAN (Chairman)
Ir Simon FW CHUNG (Immediate Past Chairman)
Ir Dr KM LEUNG (Vice Chairman)
Ir Albert WK TO (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir PK CHAN
Ir Eric CH CHUI
Ir CS HO
Ir TAM Wing Shing
Ir HO Siu Kwong
Ir SS TANG
Ir Morris SW CHEUNG
Ir HO Sai-king
Ir CHAN Yiu Hon
Ir Gordon MS WOO
Ir CL LEUNG
Ir Kenny CM CHAN
Ir Dr Edward WC LO (Ex-Off Div Council Rep)
Ir Joseph CM LEUNG (Ex-Off Discipline Rep)
Mr Patrick WW LEE (Ex-Off AMC Rep)
Mr NK CHAN (Ex-Off YMC Rep)
Ir Tony KT YEUNG (Co-opted Member)
Ir Ivan WK TSUI (Co-opted Member)
Ir Prof KT CHAU (Co-opted Member)

Session 2011/2012

Ir Dr KM LEUNG (Chairman)
Ir Geoffrey L CHAN (Immediate Past Chairman)
Ir Albert WK TO (Vice Chairman)
Ir CL LEUNG (Hon Secretary)
Ir HO Siu Kwong (Hon Treasurer)
Ir YK CHU
Ir PK CHAN
Ir Gordon MS WOO
Ir Morris CHEUNG
Ir TAM Wing Shing
Ir YH CHAN
Ir SS TANG
Ir HO Sai-king
Ir Prof KT CHAU
Ir Gary CW KO
Ir Mandy MY LEUNG
Ir Tony KT YEUNG
Ir Dr Edward WC LO (Ex-Off Div Council Rep)
Ir Joseph CM LEUNG (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Mr Jerry CHAU (Ex-Off YMC Rep)
Ir TK CHIANG (Co-opted Member)
Ir Steve KK CHAN (Co-opted Member)
Ir Stanley LEUNG (Co-opted Member)

Session 2012/2013

Ir Albert WK TO (Chairman)
Ir Dr KM LEUNG (Immediate Past Chairman)
Ir CL LEUNG (Vice Chairman)
Ir HO Siu Kwong (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir Steve KK CHAN
Ir YH CHAN
Ir Dr Edward WC LO
Ir Prof KT CHAU
Ir TAM Wing Shing
Ir TK CHIANG
Ir SS TANG
Ir HO Sai King
Ir Gordon MS WOO
Ir Gary CW KO
Ir Tony KT YEUNG
Ir Geoffrey L CHAN (Ex-Off Div Council Rep)
Ir Joseph CM LEUNG (Ex-Off Discipline Rep)
Mr Patrick LEE (Ex-Off AMC Rep)
Mr Vincent LEUNG (Ex-Off YMC Rep)
Ir WI HO (Co-opted Member)
Ms Christine TSE (Co-opted Member)
Ir Stanley LEUNG (Co-opted Member)

Session 2013/2014

Ir CL LEUNG (Chairman)
Ir Albert WK TO (Immediate Past Chairman)
Ir HO Siu Kwong (Vice Chairman)
Ir PK CHAN (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir Steve KK CHAN
Ir Mandy MY LEUNG
Ir YH CHAN
Ir Dr Edward WC LO
Ir Prof KT CHAU
Ir TAM Wing Shing
Ir TK CHIANG
Ir SS TANG
Ir WI HO
Ir CL WONG
Ir Gary CW KO
Ir Tony KT YEUNG
Ir Geoffrey L CHAN (Ex-Off Div Council Rep)
Ir PN IP (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ms Serene CHEUNG (Ex-Off YMC Rep)
Ir CF CHAN (Co-opted Member)
Ir Tony LEE (Co-opted Member)
Ir Stanley LEUNG (Co-opted Member)

Session 2014/2015

Ir HO Siu Kwong (Chairman)
Ir CL LEUNG (Immediate Past Chairman)
Ir PK CHAN (Vice Chairman)
Ir CF CHAN (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir Steve KK CHAN
Ir Mandy MY LEUNG
Ir YH CHAN
Ir Dr Edward WC LO
Ir Stanley LEUNG
Ir TAM Wing Shing
Ir TK CHIANG
Ir SS TANG
Ir WI HO
Ir CL WONG
Ir Dr Bryan MH PONG
Ir Tony KT YEUNG
Ir Dr KM LEUNG(Ex-Off Div Council Rep)
Ir PN IP (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ms June YIP (Ex-Off YMC Rep)
Ir Andrew KW YAN (Co-opted Member)
Mr Raymond KM SZE (Co-opted Member)

Session 2015/2016

Ir PK Chan (Chairman)
Ir HO Siu Kwong (Immediate Past Chairman)
Ir CF CHAN (Vice Chairman)
Ir Dr Edward WC LO (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir Steve KK CHAN
Ir Tony KT YEUNG
Ir Dr Bryan MH PONG
Ir WI HO
Ir Andrew KW YAN
Ir SS TANG
Ir YH CHAN
Ir TK CHIANG
Ir CL WONG
Ir Stanley KW LEUNG
Ir Mandy MY LEUNG
Ir TAM Wing Shing
Mr Raymond KM SZE
Ir Peter SS TANG
Ir Dr KM LEUNG(Ex-Off Div Council Rep)
Ir PN IP (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ms Serene CHEUNG (Ex-Off YMC Rep)
Ir Simon TSUI (Ex-Off SSC Rep)
Mr Tommy CF LAM (Co-opted Member)
Ir Ken KT CHAN (Co-opted Member)
Ir Alex TH FU (Co-opted Member)

Session 2016/2017

Ir CF CHAN (Chairman)
Ir PK CHAN (Immediate Past Chairman)
Ir Dr Edward LO (Vice Chairman)
Ir TK CHIANG (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir Steve KK CHAN
Ir Dr Bryan MH PONG
Ir Alex TH FU
Ir Andrew KW YAN
Ir WI HO
Ir Peter SS TANG
Ir Tommy CF LAM
Ir Tony KT YEUNG
Ir Mandy MY LEUNG
Ir CL WONG
Ir Stanley KW LEUNG
Ir Raymond KM SZE
Ir HO Siu Kwong (Ex-Off Div Council Rep)
Ir Gary CW KO (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ms June YIP (Ex-Off YMC Rep)
Ir Simon TSUI (Ex-Off SSC Rep)
Ir YH CHAN (Co-opted Member)
Ms Candy HM LEUNG (Co-opted Member)
Ir Dr Ken CHAN (Co-opted Member)

Session 2017/2018

Ir Dr Edward WC LO (Chairman)
Ir CF CHAN (Immediate Past Chairman)
Ir TK CHIANG (Vice Chairman)
Ir Tony KT YEUNG (Hon Secretary)
Ir YK CHU (Hon Treasurer)
Ir Steve KK CHAN
Ir Alex TH FU
Ir WI HO
Ir Tommy CF LAM
Ms Candy HM LEUNG
Ir Stanley KW LEUNG
Ir Dr Bryan MH PONG
Ir Raymond KM SZE
Ir Peter SS TANG
Ir CL WONG
Ir Andrew KW YAN
Ir YH CHAN
Ir HO Siu Kwong (Ex-Off Div Council Rep)
Ir Gary CW KO (Ex-Off Discipline Rep)
Mr Indi WF WONG (Ex-Off AMC Rep)
Ms June YIP (Ex-Off YMC Rep)
Ir Simon TSUI (Ex-Off SSC Rep)
Ir Walter AU (Co-opted Member)
Ir CHAN Nga Kit (Co-opted Member)
Ir YH LEUNG (Co-opted Member)

40 Electrical Division Anniversary 程心E重薪火相傳 Nurturing Our Young for Electrical Engineering

List of Electrical Blog published in Hong Kong Engineer during October 2006 to June 2014

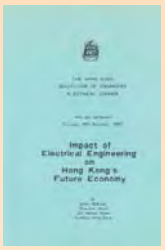
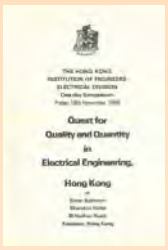
Blog No.	Title & Author
1	What is a transformer? by Ir Dr FC CHAN
2	Electric cables by Ir Gordon WOO
3	Earthing by Ir YH CHAN
4	What are industrial electrical power plugs by Ir L CHAN
5	Electric motor by Ir Joseph LEUNG
6	Electrical conduit by Ir CL WONG
7	Electric cable by Ir Dr KM LEUNG
8	SCADA by Ir Dr FC CHAN
9	Electrical partial discharge by Ir KM YUNG
10	Liquid crystal display (LCD) by Ir Dr KM LEUNG
11	Compact fluorescent lamps by Ir HO Sai King
12	Lightning protection by Ir Albert TO
13	Socket outlets in bathrooms by Ir Eric PANG
14	Power quality by Ir KM YUNG
15	Testing & commissioning electrical installations by Ir L CHAN
16	Power Factor by Ir CS Ho/Ir Dr FC CHAN
17	Electric Blankets by Ir YH CHAN
18	Electric Fuses by Ir PK CHAN
19	Connecting renewable energy systems to the grid by Ir HO Siu-kwong
20	Equipotential bonding by Ir Dr KM LEUNG
21	Induction Cooking by Ir Dr FC CHAN
22	Lampholders by Ir CS HO
23	Periodic inspection, testing and certification of fixed electrical installation by Ir YH CHAN
24	Generators by Ir PK CHAN
25	Trenchless technology for cable installation by Ir Gordon WOO
26	Code of Practice for the Electricity (Wiring) Regulations by Ir YH CHAN
27	Electric water heaters by Ir Dr KM LEUNG
28	Electric room heaters by Ir Dr KM LEUNG
29	Switchboard by Ir WS TAM
30	Three-phase supply by Ir WK LEE
31	Supply voltage - its origin and history by Ir Gordon WOO
32	Use and safety of TV Sets by Ir YH CHAN
33	Line arrestor by Ir Gordon WOO
34	Current transformers Ir Dr KM LEUNG
35	Uninterruptible power supply (UPS) by Ir Simon CHUNG
36	Photovoltaic system by Ir Gordon WOO
37	Wind energy by Ir Gordon WOO
38	What you need to know about LEDs by Ir WK LEE
39	Ride-through design for voltage dip by Ir HO Siu-kwong
40	Traction power system in Hong Kong by Ir Dr KM LEUNG
41	Motor starters by Ir WS TAM
42	Railway development trends in Hong Kong by Ir Dr KM LEUNG
43	From antique to modern transportation by Ir Dr KM LEUNG
44	Busway by Ir WS TAM
45	Railway power supply system Ir Dr KM LEUNG
46	Automatic train control by Ir CL LEUNG
47	Restrictions on live work by Ir Dr KM LEUNG
48	Protecting underground electricity cables from damage by third parties by Ir Dr KM LEUNG
49	Lifts by Ir WS TAM
50	Electric car by Ir Gordon WOO
51	East Rail Line by Ir Dr KM LEUNG
52	Peak Tram by Ir Dr KM LEUNG
53	Tramways by Ir Dr KM LEUNG
54	Extra-low-voltage systems by Ir WK LEE
55	Electrical protection for large rating generators by Ir PK CHAN
56	Application of IGBT for Hong Kong trains by Ir CL LEUNG
57	Battery by Ir Dr Edward LO
58	Train control for the Express Rail Link by Ir Dr KM LEUNG
59	Smart grid by Ir Gordon WOO
60	South Island Line East by Ir Dr KM LEUNG
61	West Island Line by Ir Dr KM LEUNG
62	Hong Kong's electricity supply system by Ir PK CHAN
63	Kwun Tong Line Extension by Ir Dr KM LEUNG
64	"Green Power" by Ir WS TAM
65	Shatin-to-Central Link by Ir Dr KM LEUNG
66	Fast charging of electric vehicles by Ir Gordon WOO
67	Electromagnetic fieldsb y Ir WS TAM
68	Railway signalling system design by Ir CL LEUNG
69	System load regulation by Ir HO Siu-kwong
70	Harmonic filt ers by Ir WS TAM
71	Power system frequency and voltage control by Ir HO Siu-kwong
72	Electrical work by Ir Steve CHAN
73	Data centre reliability requirements by Ir Gordon WOO
74	Rewiring inside domestic flats by Ir WI HO
75	HomePlug by Ir Geoffrey CHAN
76	Smart meters by Ir HO Siu-kwong
77	Progress on Guangzhou-Shenzhen- Hong Kong Express Rail Link by Ir Dr KM Leung
78	C-trains by Ir Dr KM Leung
79	Extension of automated people mover at airport by Ir Dr KM LEUNG
80	Induction lighting by Ir PK CHAN
81	South Island Line (East) by Ir Dr KM LEUNG
82	Supercapacitors by Ir CL LEUNG
83	The signalling systems of high-speed railways by Ir CF CHAN
84	Benefit s of smart metering t o e nd users by I r HO S iu-kwong
85	Cable management by Ir WS TAM
86	Maintenance of busduct installation by Ir WI HO
87	Energy-saving initiatives for new railway lines by Ir CL LEUNG
88	High-voltage direct current (HVDC) transmission by Ir HO Siu-kwong
89	The basics of a railway signalling system by Ir CF CHAN
90	Lighting dimmer by Ir WS TAM
91	Regenerative lifts in public rental housing by Ir WI HO

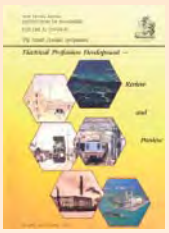
List of Annual Symposiums organised by the HKIE Electrical Division during 1983 to 2018

Year	No	Symposium Title
1983	1	The (15th Edition) IEE Wiring Regulations and their Compliance in Hong Kong
1984	2	Management and Implementation of Electrical Safety in Hong Kong
1985	3	Effective Use of Electricity in Hong Kong
1986	4	Development of Electrical Power
1987	5	Impact of Electrical Engineering on Hong Kong's Future Economy
1888	6	Quest for Quality and Quantity in Electrical Engineering, Hong Kong
1989	7	In Phase with the 90's
1990	8	For Better or For Worse – An Electrical Engineering Perspective
1991	9	Electrical Profession Development – Review and Preview
1992	10	The Safety Imperative
1993	11	Energy – A Burning Issue
1994	12	Great Expectations?
1995	13	In Search of Quality
1996	14	Sustainable Development – Electrical Industry
1997	15	Achieve and Development – 50 Years Plus
1998	16	Reliability – An Engineering Excellence
1999	17	Powering into the Next Millennium
2000	18	Initiatives for the New Millennium
2001	19	Globalization of Electrical Industry
2002	20	A New Era of Opportunities and Challenges for Electrical Engineers
2003	21	A World Class City – An Electrical Engineering Perspective
2004	22	Competitive Advantages of Hong Kong – An Electrical Engineering Perspective
2005	23	The New Frontiers of Electrical Engineering
2006	24	Engineering Excellence Through Continuous Improvement
2007	25	Sustainability and Environmental Challenges in Electrical Engineering
2008	26	Mega Projects – Hong Kong and Beyond
2009	27	Engineering the Changes
2010	28	Modern Projects – Challenges and Solutions
2011	29	Frontier of Carbon Neutral Electrical Technology
2012	30	Innovative Electrical Engineering for a Low Carbon City
2013	31	Smart Infrastructure & Mega Projects in Electrical Engineering
2014	32	Powering into the Future
2015	33	Drive for Efficiency
2016	34	Innovations for Smart City
2017	35	Engineering a Climate-ready City
2018	36	Electrical Engineering Digitalization – ABC (A= Artificial Intelligence, B=Big Data, C=Cloud Computation)

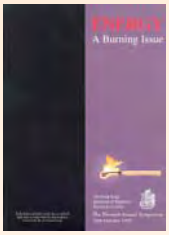




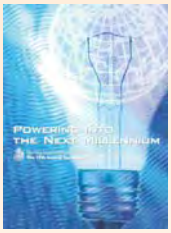




1993-2000





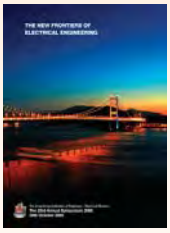




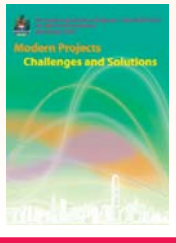

2001-2008

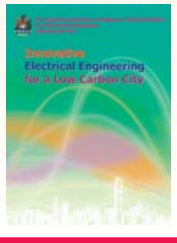
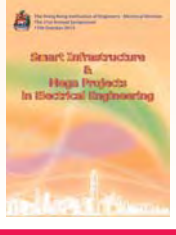







2009-2015

From 2016, the Symposium Proceedings were issued in digital format.

List of Factories Visited by The HKIE Electrical Division During Overseas Technical Visit in 1990-2017

July 1990 — Canada

Darlington Nuclear Power Plant; Canatal Computer Room Air-conditioning (CRAC) Plant

July 1991 — Japan

Toyota car manufacturing plant; Meidensha electrical product plant

July 1993 — Singapore

World Trade Centre Building

July 1994 — Germany, France and England

(1) Raychem Gmbh in Munich; (2) GrasslinGmbh& Co. at Stuttgart; (3) F&G Cables in Cologne; EDF Clamart Research Centre in Paris; (4) Pirelli Cables Ltd. in Newport; (5&6) IEE Headquarters in London; Lighting Industry Federation Presentation in London; Merlin Gerlin in Leeds

July 1995 — Portugal, Spain France

(1 to 4) EFAECE Transformer /Switchgear/Electronics in Porto; (5) GE Power Controls in Barcelona, Hagar MCBs in Strasbourg; Legrand in Paris

July 1996 — Japan

(1) Matsushita Electric in Osaka; (2) Mitsubishi Electric in Nagoya; (3) NHK Broadcasting Centre in Tokyo; Meidensha in Tokyo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April 1997 — Australia

(1 & 2) Goninan Light Rail Depot in Melboure; (3) MM Cables in Sydney


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July 1998 — Italy and Switzerland

(1) ABB Transformer Factory in Rome; (2) Elex Lift and Lighting Factory in Milan; (3) Schyller Wiring Equipment Factory in Milan


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July 1999 — South Africa

(1) Rhomberg Electronics in Cape Town; (2) Koeberg Nuclear Power Station; (3) SABS Head Office in Pretoria; Strike Technologies in Johannesburg; (4) SABS High Voltage Testing Facilities (NETFA); CCG; (5) BEKA Lighting Products; (6) Aberdare Cable (Pty) Ltd.


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August 2000 — Scandinavian Europe

(1) Demko Laboratory in Copenhagen; (2) ABB High Voltage Distribution Factory in Oslo; (3) ABB Component Factory at Ludvika;(4) SemkoLabortory in Stockholm; (5&6) KONE Elevators Factory and Lift Test Site in Helsinki


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July 2001 — Hungary, Austria, Czech Republic and Germany

(1 & 2) Univolt Cable Management Factory – Vienna; (3) Futurit Traffic Safety Systems in Vienna; (4) Preciosa Lighting Plant in Prague; (5) Siemens Plant in Berlin; VEM Motor Plant in Hannover; (6) Transrapid' Magnetic Levitation Rail Technology Testing Ground in Lathen


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March 2002 — New Zealand

(1 to 3) Geothermal Combined Cycle Power Station in Rotokawa; (4) Pacific Plastic Recycle Limited in Wellington; (5) General Cable in Christchurch; (6) HVDC Transmission Link in Benmore


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March 2002 — New Zealand


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6

August 2003 — Amsterdam, Milan, and Geneva

(1) Testing Laboratory (KEMA) in Amsterdam; (2&3) Arena Stadium Lighting & Security Systems in Amsterdam; (5) ABB Manufacturing Plant – Milan; (6)MGE UPS Plant.


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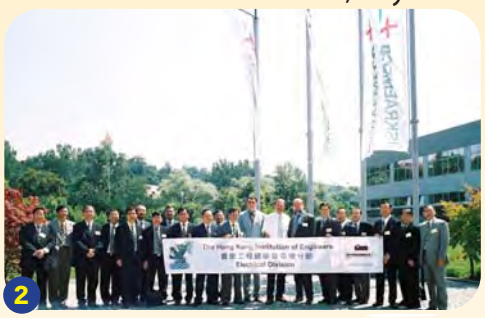
July 2004 — Eastern Europe

(1) Koncar Power Transformers (KPT) Ltd' in Zagrab; (2) Iskraemeco Energy Measurement & Management Ltd in Ljubljana of Slovenia; (3) Schindler &Eacalator Ltd. in Vienna; Raychem cable plant in Munich


1


2


3

June 2005 — Turkey and Greece

(1) Areva Transformer Factory in Istanbul; (2) Siemens Power T&D Facilities; Landis &Gyr A.E. Meter Factory in Athens; Philips Hellas SA in Athens

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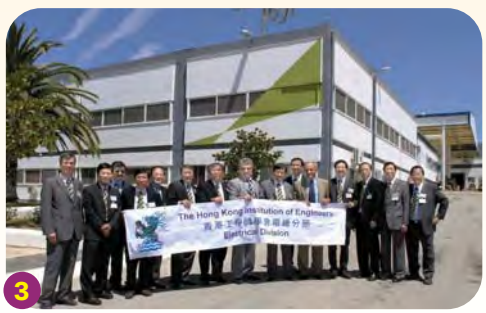
3

July 2006 — Russia, Finland and Sweden

(1) Mikron Electronic Factory' in Moscow; (2) Siemens Gas Turbines Factory' in Finspong; (3) Kone Reliability Laboratory Building' at Hyvinkaa in Helsinki

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July/August 2007 — Estonia, Latvia, Lithuania, Poland and Germany

(1) Silo Substation in Lithuania; (2) Areva Relay Factory in Swiebodzice (Poland); (3) Siemens Factory at Schaltwerk (Berlin)


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3

May 2008 — France

(1) Siemens factory in Grenoble; (2) Philips Centre (OLAC) in La Valbonne; (3) Airbus factory in Toulouse Airport; EDF (French Electricity) Group in Paris

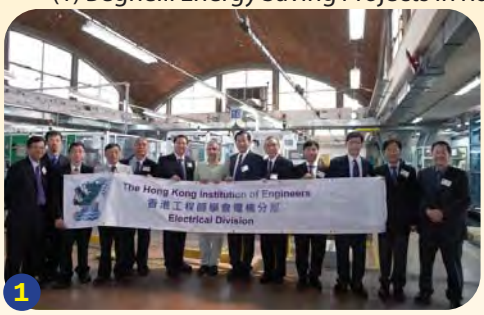
1


2

3

June 2009 — Southern Italy, Malta and Germany

(1) Beghelli Energy Saving Projects in Rome; Schneider Factory in Napoli; (2) Wind Farm in Palermo; (3) Siemens Factory in Frankfurt



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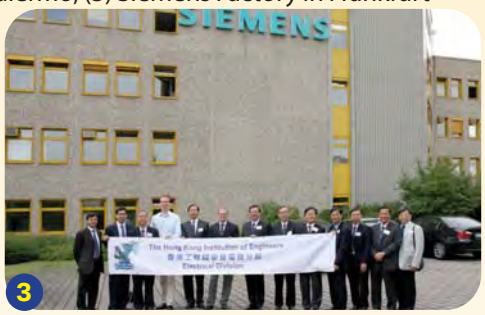
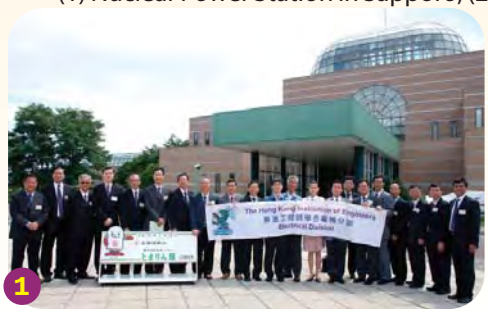
2



3

July/August 2010 — Japan

(1) Nuclear Power Station in Sapporo; (2) Electric Vehicle Factory in Tokyo; (3) District Heating & Cooling System (DHCS) at Ikebukuro


1

2


3

July 2012 — Balkan Countries in Eastern Europe

Metro Station Equipment in Sofia (Bulgaria); (1) ABB Power Equipment in Ohrid (Macedonia); (2) Local 110kV/10kV Substation in Sarajevo of Bosnia; (3) Nicola Tesla Museum in Belgrade (Serbia)

1

2

3

June 2014 — Alaska & Vancouver

Machine Control Room of Cruise Vessel; British Columbia Institute of Technology (BCIT); (1) Microgrid Demonstration Project in Vancouver; (2) Ballard Power Systems (Fuel Cells) in Vancouver

1

2

3

August 2015 — Iceland

(1 & 2) OrkuveridJord Geothermal Power Plant in Reykjanes

1


2


3

July 2016 — West Coast of USA

(1) Solar Thermal Plant at Ivanpah; (2 & 3) UCSF Benioff Children's Hospital at Mission Bay of San Francisco


1

2

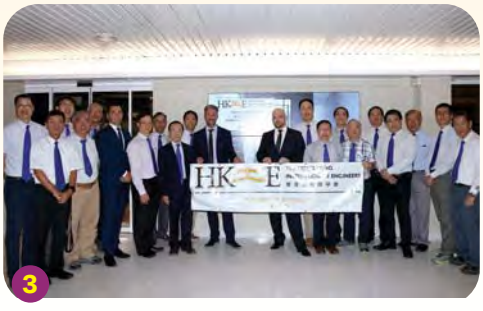
3

July 2017 — Portugal/Spain

(1) Smart City Project at Evora; (2) Schneider Factory at Madrid; (3) Fermator Factory at Barcelona

1

2



3

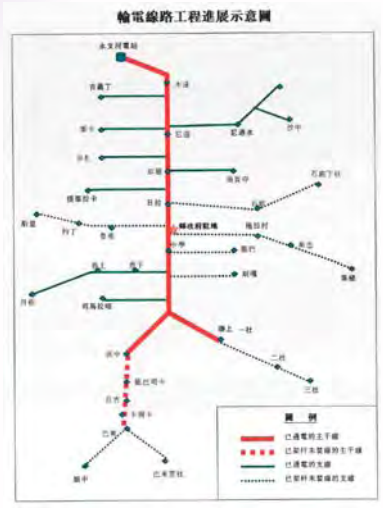
List of Mainland Visits in 1999-2017

2 – 7 Sep 1999

西安 敦煌

21 – 25 Apr 2000

昆明



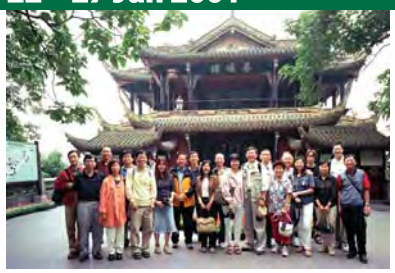
雲南省德欽縣燕門鄉供電線路工程捐贈儀式。

17 – 20 Nov 2000

杭州 上海

22 – 27 Jun 2001

九寨溝 四川



22 – 25 Nov 2002

海南島

28 Nov – 1 Dec 2003

貴州

22 – 26 Oct 2004

長江三峽

24 – 30 Sep 2005

黃山 西遞 南京

16 – 22 Sep 2006

新疆 北疆

12 – 16 Sep 2007

湖南張家界鳳凰城

5 – 8 Dec 2008

廣東 粵北

23 – 28 Oct 2009

湖北武當山

10 – 15 Sep 2010

上海 南京

8 – 13 Sep 2011

長春 吉林 哈爾濱

27 – 31 Oct 2012

山東 濟南 泰山

7 – 14 Sep 2013

西藏 林芝 拉薩 日喀則

23 – 30 Aug 2014

雲南 香格里拉

10 – 14 Oct 2015

山西

6 -10 Sep 2016

徐州

16 – 22 Sep 2017

甘肅 青海 敦煌

Photo Competition

HKIE Electrical Division 40th Anniversary Photo Competition

To celebrate its forty years of establishment, the HKIE Electrical Division organised a series of events under a common direction "Nurturing Our Young for Electrical Engineering" (程心E重薪火相傳). In this regard, the Photo Competition with a theme "Electrical Engineering and Life" (電機工程與生活) was organised. The objectives of the competition were to allow the community to understand more about electrical engineering profession, and highlight the electrical engineering profession's values and contributions to the community.

The Photo Competition had 17 participant entries with a total of 45 photos submitted. The judging session was held on 5 March 2018 with the judging panel consisting of Ir LO Tin Hoi, Ir Prof NG Tung Sang and Ir Raymond WONG Wai Man. The photos with the best degree to illustrate the theme "Electrical Engineering and Life" with artistic merit would be judged for the winners.

Unforgettable Moments during CLP Training – 4

The Award Presentation Ceremony was successfully held on 15 March 2018. We were delighted to have Director of EMSD Ir Alfred SIT, JP as the guest of honour to deliver a speech and present the awards and prizes to the top 3 winners. These 3 top winners are:

Champion:
Unforgettable Moments during CLP Training – 4
by TAI Ming Ngai

First Runner-Up
Stepping Forward
by Kelvin LI

Second Runner-Up
Sea of Photovoltaic Panel
by LAU Ka Tai

Champion: TAI Ming Ngai

Stepping Forward

First Runner-Up: Kelvin LI

The name of eight Merit Award recipients are:

CHAN Chun Pui, Brian
CHAN Shu Long, Zico
CHAN Wan Yu
CHEUNG Hon Lun
LAU Ka Tai
LI Hoi Ching
TAI Ming Ngai
YAU Chun Lok

Second Runner-Up: LAU Ka Tai

Sea of Photovoltaic Panel

Ir Tony YEUNG presented a certificate of appreciation and to our guest of honour Ir Alfred SIT, JP.

Group Photo taken during the Photo Competition Award Presentation on 15 Mar 2018

The following submission received merit awards

8 Merit Awards

Overhead Line Training
by LI Hoi Ching

Unforgettable Moments during CLP Training - 1
by TAI Ming Ngai

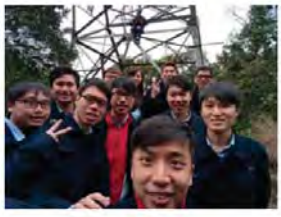
人生贏家 3
by CHAN Shu Long, Zico

夕陽無限好
by CHAN Chun Pui, Brian

Working with Customer's Supply
by CHAN Wan Yu

Photovoltaic Panel in Kai Tak Development Area
by LAU Ka Tai

Electricity and Safety
by CHEUNG Hon Lun



Here We Go
by YAU Chun Lok

Participants' photography submissions

薪火相傳 奮力向上

Generation Substation
by CHAN Chun Pui, Brian

向著標杆直跑

The First Essential: Transformer

The Second Essential: Main Switchboard
by CHEUNG Hon Lun

Preventive Measures

Cable Tunnel

Generation Substation
by CHAN Wan Yu

Insulated Elevating Work Platform (EWP)

人生贏家 1

人生贏家 2

人生贏家 4
by CHAN Shu Long, Zico

香港工程師學會電機分部
慶祝成立四十周年
攝影比賽

Our judging panel consisting of Ir LO Tin Hoi, Ir Prof NG Tung Sang and Ir Raymond WONG Wai Man (from left to right). Their selected winning photos were on the table.

Participants' photography submissions

Renewable and Sustainable
by CHENG Chun Hei

電力啓航
by HO Ka Chun, Eric

電力光華耀香江 1

電力光華耀香江 2
by KOT Yee Mei, Mimi

陽光下的海洋
by LAM Chun Fai

Evolution of Lighting Technology to Improve Public Comfortability and Sustainability through Application
by LEE Wing Shing

Hong Kong - Zhuhai - Macau Bridge
by LI Hoi Ching

Overhead Line Training on Transmission Line Tower
by LI Hoi Ching

種棟
by LI Hoi Ching

Vessels of the Building
by LI Ka Hin Kelvin

Unforgettable Moments during CLP Training - 2 & 3
by TAI Ming Ngai

湖上的小風箏(第一集) 湖上的小風箏(第二集) 湖上的小風箏(第三集)
by WONG Ching Yiu

Preparation for Protection System Isolation

Preparation for Secondary Injection Test on Auto-Syn relay
by YAU Chun Lok

Protection Relay Testing

Reborn
by YU Ho Nam

Single Core Cable

4 Core Amoured Cable

11kV Switchgear
by CHOI Tin Chi

Paper Competition

香港工程師學會電機分部
慶祝成立四十周年
微文比賽

To celebrate its forty years of establishment, the HKIE Electrical Division has organised a series of activities around the theme: "Nurturing Our Young for Electrical Engineering" (程心 E 重薪火相傳). Paper Competition is one of the signature events, with an aim to uphold engineering professionalism and raise the public awareness on how electrical engineering interacts with our daily life. The theme of the paper competition is "Electrical Engineering and Life".

We are honored to have the following 5 distinguished engineers to be in our Judging Panel.
- Ir Dr the Honourable WK LO, Legislative Councillor, Engineering Functional Constituency, The HKSAR Government
- Ir Alfred SIT, Director, Electrical & Mechanical Services Department, The HKSAR Government
- Ir Thomas CHAN, President, the Hong Kong Institution of Engineers
- Ir Dr Edward LO, Chairman, Electrical Division, the Hong Kong Institution of Engineers
- Ir Dr FC CHAN, Past President, the Hong Kong Institution of Engineers

Submitted papers are judged based on the following criteria: (a) Appropriateness to the theme "Electrical Engineering and Life"; and (b) Clarity, Fluency, Coherence, Organization and Development. The paper selection has been a highly competitive process, and after careful consideration, we are proud to announce that:

Awards	Name	Paper Title
Champion	FUNG Tsz Yiu	Electricity – Standing by Hong Kong Every Moment
First Runner Up	AU Kwok Wun	Electrical Engineering in Hong Kong Public Housing
Second Runner Up	LI Ka Hin, Kelvin	Electrical Engineering in Our Life

The award presentation was carried out on 28 Apr 2018 by our HKIE President Ir Thomas KC CHAN.

Champion TY Fung

First RunnerUp
KW Au

Second RunnerUp
Kelvin Li

Electricity – Standing by Hong Kong Every Moment

FUNG Tsz Yiu

After the first set of street lights illuminated Hong Kong on 1 December, 1890, electricity has been standing by the citizens of Hong Kong more than 125 years. It bears witness to the evolution and development in the city. Electrical engineering supports every step of the way and valuable moment of our home. It is more inseparable from the daily life of citizens. The electrical engineers have been making significant contribution on providing a high efficient, reliable and stable supply of electricity and transport service to the community. Pursuit of innovation and change is the only way to maintain the long-term competitiveness and diversification in Hong Kong. Building a world-famed "Smart city" is the next development plan to promote high quality of living with innovation and technology. The success of implementing the plan is not only relied on the effort of the government, utilities and engineers but also requires the supports and participations from 7 million people.

Electrical engineering influences the competitiveness of economy and our daily life. Providing world-class supply reliability is the first priority of the utility companies. For example, data center development and operation of stock and commercial market require having a safe and reliable electricity supply. A robust and secure power network can minimize the risk of supply interruption and the negative impact on both business and residential communities. Railway transport is the backbone of public transport system. The railway lines of Mass Transit Railway interconnect different urbanized regions of Hong Kong Island, Kowloon and New Territories. Passengers can travel to different locations for work and visit comfortably. Therefore, it is the most popular transport option in Hong Kong. On the other hand, railway system consists of numerous infrastructures, facilities and communication network. Rolling stock, overhead line, power distribution and protection system are important in daily operation. All the subsystems are required to work accordingly and synchronously based on the fundamental design in order to achieve a high performance and reliability. With the high level of daily passenger traffic and complexity of different subsystems in the network, a comprehensive risk and asset management is necessary to anticipate possible losses. Design and implementation of procedures can reduce the occurrence of loss and financial impact. At the same time, proper and appropriate management skills are the strongest support to achieve high on-time rate of the train journey.

Professional engineers put a lot of effort on the network design, daily operation and maintenance in the pursuit of world-class supply reliability. More advanced and innovative control and monitoring systems are adopted and equipped so that the engineers are able to supervise the power networks conveniently all the time. Their effort, innovation and knowledge are powering Hong Kong's economic growth and standing by the citizens of Hong Kong.

Excellent supporting facilities such as transport systems, power distribution networks and exhibition venues enable the international exhibitors and corporates to hold large-scale public events in Hong Kong. The Formula-E championship is an international auto racing event taking place in the heart of the city. It is the second time for the contest held at Hong Kong Central Harbourfront. The motorsport racing takes these opportunities to promote the development of electric vehicle and support sustainable energy in this famous global city. The large-scale public events or conferences not only raise the reputation of the city but also encourage the exchange of advanced technologies and idea between the local and other regions.

Not only is the electrical engineering focusing on the infrastructure development, supply of electricity and transport system, it is also contributing to raising awareness on environmental protection and energy conservation. For environmental protection aspect, how to reduce carbon emission is one of the concerns. Traditional combustion-based technologies for power generation associate with air pollutants and greenhouse gas emissions. As a result, natural gas and renewable energy will occupy a larger percentage in the future combination of fuel types. Natural gas provides a quick response to meet the change of electricity demand at around half of coal's carbon emissions. The adoption of waste-to-energy as a source of electricity is a potential renewable energy technology in Hong Kong. The huge amount of municipal waste generated in our city can be used for electricity generation. Not only will energy be created in the form of electricity and heat from waste, waste-to-energy also reduces the size of landfill and the disposal cost. The first sludge treatment facility "T·Park" is putting into service since 2016 and embraces the concept of waste-to-energy.

The technology of "Smart Grid" in the future development of electricity network enhances the energy conservation, grid reliability and environmental consideration. It is different from conventional power grid which delivers power from power plant to customer demand in one direction. The "Smart Grid" integrates the two-way digital communications, intelligent devices and power system networks together to advance higher levels of energy efficiency and reliability. Renewable energy resources such as wind and solar power will coordinate with conventional combustion-based generation and battery storage system to optimize system performance under different demand periods and enhance energy conservation. It will be beneficial to reduce carbon emissions to support environmental protection efforts. Citizens will play a more important role in the future development of "Smart Grid". Every families, companies and industries will be encouraged to develop and manage their own energy usage and cost through the Advanced Metering Infrastructure (AMI) in the purpose of achieving energy-saving and low carbon lifestyle. Greater flexibility and options will be provided to the end users so that they can make contribute to develop a "Smart City" in Hong Kong.

The HKIE Electrical Division has accumulated 40 years' foundation to promote a wide range of professional services and facilitate the exchange of the latest knowledge and ideas to assist young engineers in seizing the opportunity on a new horizon. Developing the "Passing on the Torch" culture is beneficial to maintain the advancement of engineering and promote the excellent and professional tradition to the young generation. How to encourage and nurture our young for electrical engineering is closely related to how an innovation and technology culture can be fostering in an early age. The mathematical and scientific abilities of students in Hong Kong are renowned but they are not encouraged to study technological innovation subjects such as engineering which can further bring their advantages into full play. The most popular university subjects are still medicine, law and business. As a result, it is important to provide more opportunities for students to involve in the mini-projects or programs related to Science, Technology, Engineering and Mathematics (STEM) in their school life. "Dreams Come True" Program held by HK Electric is one of the activity-based learning program that help fostering secondary students an innovative mindset and creative thinking and encouraging them to learn without "wall". It also promotes environmental awareness and social responsibility in the community. We are looking forward that more young people feel interest in engineering and develop a creative and technological culture to push forward the innovative technology.

Funding Schemes provided by the government or large-scale companies encourage the development of innovative ideas and technology businesses. It can support the projects that contribute to innovation and technology upgrading in industry. It also reinforces the research culture among enterprises and establishes stronger partnerships with local research institutions such as universities. The funding from the government or companies enables the young researchers to conduct various researches and developments in different technical fields like the facilities and equipment in Smart City. It is about nurturing talent and ensuring people have a sustainable career path. Moreover, the government's supportive policies can encourage and maintain the growth and development on innovation and technology in the pursuit of long-term competitiveness comparing with other nearby cities.

The exchange of knowledge and skill between experienced engineers and young engineers is essential in engineering a new horizon. The engineers in the Division had involved in many famous projects and accumulated experience to cope with diverse technical difficulties. It is encouraging that young engineers can learn how to be a professional engineer from their valuable experience and knowledge. The high standard of the profession and excellent reputation in Hong Kong Engineering are beneficial for young engineers to participate in numerous of infrastructure projects of the Belt and Road Initiative. The foundation of the HKIE Electrical Division assists the engineers in seizing the opportunity on their career path. A "Passing on the Torch" culture can be developed to pass the high standard of the profession to the young generation and nurturing our young to become professional engineer.

In brief, electricity is powering every people of Hong Kong to contribute their efforts on propelling the society forward. Reliable and efficient power supply and transport service are supporting the daily life of citizens and the evolution of city. The success of electricity engineering in the city relies on the professional engineers with fruitful experience and knowledge. Developing a "Passing on the Torch" culture is advantageous to maintain the advancement of engineering and promote the excellent and professional tradition to the young generation. Young engineers can equip themselves with innovative and creative thinking to seizing great opportunities on the new and large-sized engineering projects such as the Smart City and the Belt and Road Initiative.

Electrical Engineering in Hong Kong Public Housing

AU Kwok Wun

1. Introduction

Electricity is essential and indispensable in everyday life especially in the modern society. With the growth of "E-generation" and technological advancement, fulfilling human's basic needs is no longer the only mission of utilizing electricity. In Electrical Engineering, innovative ideas are continuously proposed by Engineers to improve the quality of human life. In my perspective, the basic elements for a high quality of life in relation to Electrical Engineering are Stability, Convenience, Energy Efficiency and Environmental Conservation. Instability and inconvenience will hinder people to achieve their basic need for life which should be minimized and avoided. High energy efficiency and environmental conservation can reserve natural resources for future use, minimize the impacts for the environment aroused from electricity generation as well as providing better living environment to human life.

In Hong Kong, the government keeps improving their Electrical design and management techniques to cope with this fast-changing society. In the following, different measures to improve quality of life in respect of Electrical Engineering in Hong Kong public housing will be introduced and discussed.

2. Electrical Engineering in Public Housing

2.1 Low Voltage Distribution System

In public housing, the Hong Kong Housing Authority (HKHA) tries every means to maintain the low voltage electrical power distribution to tenants without any interruption. Therefore, generator set is provided in every public housing domestic block to cope with emergency situation to maintain essential power supply for fire services system, essential lighting etc. in order to facilitate evacuation for tenants.

During Periodic Inspection, Testing and Certification (PITC), the low voltage electrical power supply will be shut down for about half-day to process the statutory inspection which causes certain degrees of inconvenience to the tenants. Considering this issue, HKHA improves the electrical design with dual feed to allow the generator set to supply electrical power to several passenger lifts to minimize the impact to tenants during this half-day maintenance activity, especially to the elderly and people with disabilities. Also, advance notice will be given to tenants and relevant bodies (i.e. Fire Services Department and Hong Kong Police Force) in case of emergency situation. In order to ensure the functionality of the power distribution system, minimize system breakdown rate and maintain stability of the system, the HKHA proactively carries out PITC in a regular interval of three years which is more stringent than the statutory requirement of five years.

Looking to the above strategies taken by the HKHA, it can be observed that stability and convenience can be achieved by improving electrical design and improvising property management techniques.

2.2 Lighting System

Considering the convenience and safety for the disabilities, the Barrier Free Access (BFA) came into operation in 1997 and was reviewed in 2008. In BFA 2008, the lighting level is specified and strengthened for communal area of domestic block to cater the need of people with impaired vision. However, higher energy consumption would be induced to maintain the increased lighting level. To satisfy both statutory requirement and energy saving design consideration, the HKHA invented the Two Level Lighting System. In Two Level Lighting System, there are two sets of lighting at the corridor of typical domestic floors. One set is normally powered to maintain normal lighting level, the other is standby lightings which will be turned on by the occupants to fulfill BFA illumination requirement when needed. There are lighting switches located at corridor and inside domestic flats for the occupants to turn on the standby lightings when in need. After predetermined timer setting lapsed, those standby lightings will be turned off for energy saving purpose. Under this operation strategy, lots of energy can be saved since the occupancy level for corridor is considered low during non-peak hours.

Besides Two Level Lighting System, HKHA also adopted different energy efficient measures for the lighting system in public housing. In older public housing estate, T8 fluorescent tube and electromagnetic ballast was widely adopted in the lighting system design. However, with technological enhancement, more energy efficient luminaires and light fittings are developed such as electronic ballast, T5 Fluorescent tube and LED lightings. HKHA therefore first implemented a programme to replace all existing electromagnetic ballast to electronic ballast in old public housing estate. This huge replacement exercise had been completed in the year of 2015. Also, the replacement of T8 fluorescent tube by T5 fluorescent tube has been undergoing since 2003. For newly constructed domestic buildings, LED

bulkhead is adopted as standard design for communal area of domestic blocks in HKHA. With high energy efficient characteristic of LED, wide adoption of LED in the society is expected.

Furthermore, sensor adoption is one of the other examples for HKHA's energy efficient lighting system. In current design, motion sensors are adopted for luminaires in the area of low occupancy level (such as refuse storage and material recovery room, staircase etc.) and photocell sensors are adopted for luminaires near fenestration area. HKHA has been taking proactive actions and striving for new initiatives to cope with the fast changing technological advancement in the society.

2.3 Other Energy Efficient Measures

In other Building Services Systems, large amount of power consuming equipment exist in the building. HKHA has set out high standard of requirement in equipment selection to ensure the attainment of energy efficiency on the whole of electrical system. In HKHA's projects with commercial centre, community hall etc. which require the adoption of central air-conditioning system, water-cooled condenser and high energy efficient chiller (i.e. oil-free chiller) are highly recommended and considered during planning and design stage of public housing development. For fresh water supply system, booster pumps equipped with variable speed drive (VSD) are adopted as a standard design in all HKHA domestic blocks. Under VSD application, the electrical power can be reduced with the cube of the speed. VSD is also applicable to fans for air-conditioning and mechanical ventilation system which is another potential field in developing energy efficient strategy.

However, the most energy efficient way is to minimize the use of power consuming equipment. In Kai Ching Estate, HKHA also takes part in the District Cooling System designed, operated and maintained by the Electrical and Mechanical Services Department (EMSD). By connecting the air-conditioning system to the EMSD's central plant, the use of independent chiller at individual buildings can be eliminated, thus increasing the energy efficiency. Furthermore, HKHA has adopted Zero Irrigation System (ZIS) in many of the HKHA's project since 2013. ZIS eliminates the use of potable water supply and makes use of the recycled rainwater which forms a self-sustaining cycle. The rainwater is stored in the retention boxes underneath the planters and supplied to the plants by capillary action when in need. In this regard, the use of irrigation system can be avoided and the application of irrigation pumps is also eliminated which saves large amount of energy.

Besides equipment efficiency, HKHA has been adopting lots of other energy saving measures. For examples, lift regenerative power modules are adopted for lift installation. When the lift operates during downward direction with full load condition and during upward direction with no load condition, lots of energy can be saved and regenerated. The regenerated power will be returned back to the grid system to supply electrical power to other communal building services system of domestic blocks. The other examples such as the adoption of carbon monoxide (CO) and nitrogen dioxide (NO2) sensors in carpark which reduce the operation of mechanical ventilation system, customizing chiller operation with due consideration of the performance of the equipment under different load condition etc. are being implemented by HKHA continuously to achieve the goal of energy efficient buildings.

2.4 Renewable Energy

To ease the shortage of natural resources and reduce the environmental impacts aroused from electricity generation caused by fossil fuel consumptions, renewable energy has become the trend of the World. In public housing, Photovoltaic (PV) panel is widely adopted. The solar energy absorbed from the panels will be converted to electrical energy and supplied to grid system or saved in battery cells for the use of other communal building services system inside domestic buildings. HKHA has been exploring materials with high efficiency for PV panels such as monocrystaline, in order to maximize the performance of this renewable system and explore the possibility of PV system expansion. Apart from PV panels, HKHA also implemented Building-integrated Photovoltaics (BIPV) for some of the covered walkways in the public housing estate.

Besides, to minimize road traffic air pollution and reduce greenhouse gases emission, the government highly encourages the use of Electric Vehicle (EV) in order to conserve the environment and reduce the use of diesel and petrol products. HKHA also help promoting this environmental friendly innovation by providing large amount of EV charging facilities in HKHA's newly constructed carpark so as to encourage the public to consider adopting EV instead of conventional vehicles.

3. Conclusion and Way Forward

HKHA has been taking new initiatives and proactive actions to improve the quality of living in public housing by enhancing the electrical design. The government should take the lead as an example to drive the private sector to achieve innovative and intelligent Electrical Engineering design, which allows the whole society to become Stable, Convenient, Energy Efficient and Environmental friendly.

Electrical Engineering in Our Life

LI Ka Hin, Kelvin

Can you imagine how the society will be if there is no electricity in our life?

Early in the 17th century, scientists have already gained interest in the research of electricity. An English scientist, William Gilbert, first studied the lodestone effect from static electricity produced by rubbing amber. The word "Electricity" was transformed from the New Latin word "electricus" which refers to the property of attracting small objects after the amber is being rubbed. With the rapid development of electrical science, electrical engineering had seen a huge progress in the late 19th century. Since then, electricity had become an essential tool in modern life.

Electrical engineering refers to the professional engineering discipline that generally deals with the study and application of electricity, electronics, and electromagnetism. Modern industry of electrical engineering has developed and branched out into a number of specialized categories, including power generation, transmission and distribution systems, motors, electricity storage, control systems and electronics. In today's technology driven world, electrical engineering is the foundation and driver of innovation that utilize different technologies to improve our quality of life.

Conventionally, electrical power is generated by electro-mechanical generators driven by steam produced from combusting fossil fuel. The power plant in Hong Kong use coal and natural gas as the major fuels to generate electricity. Hot steam is generated by burning the fuels and used to drive the turbines. The process converts part of the internal energy of the steam into useful kinetic energy. The electric generators then transform kinetic energy into electricity. Although fossil fuels combustion is a relatively cheap way to generate electricity, the pollution impact and sustainability of burning fossil fuels had become a major concern in power generation industry. Burning of fossil fuels emits air pollutant and greenhouse gases which is the major cause of climate change and global warming. Owing to these adverse effects, engineers had been developing renewable energy sources that are sustainable or capable to be naturally replenished such as solar energy, hydro power, wind power, biomass energy and geothermal energy. Due to the intermittent nature of renewable energy, it is not as reliable as using fossil fuels. Therefore the adoption of renewable energy generation is always hindered by natural constraints and geographical limitations.

Transmission and distribution of electricity requires a well-established power network. Power plants are usually located at remote area to reduce the impact to the surrounding population. In Hong Kong, the electricity generated in the power plant is stepped up to high voltage at 275kV to 400kV before transmission. The reason of using high voltage in transmission is to reduce transmission current and thus the power lost as heat due to the resistant along the cables can be minimized. A transmission network formed by underground cables, submarine cables and overhead lines carries the electricity over long distance to the zone substation at the major consumption areas. For safety and practical concerns, the voltage is stepped down to 11kV, 22kV or 33kV in the zone substation and distributed throughout the distribution network to consumer's distribution substations. Voltage is further stepped down to 380V (3-phase) or 220V (single-phase) and supplied via the low voltage distribution network to the customers. The low voltage distribution network usually starts with the distribution transformer. The distribution transformer converts the voltage from the medium voltage from the power company to low voltage level that is suitable for direct consumption by the end users.

Safety is always the first priority in electrical system. In order to avoid severe damages from electrical system faults, overloading and overcurrent, electrical protective devices are installed in the electrical circuit. Electrical protection is done by isolating the faulted equipment, machinery, components or devices from the rest of the electrical network while keeping the power system stable and under normal operation. A protective device is a protection relay controlling the tripping of the circuit breakers of a component of the network. It is an automatic tripping device to break the connection of a part of the network in case of abnormal electrical conditions. A typical protective device consists of three basic components, instrument transformer, relay and circuit breaker. Apart from protective devices, earthing system is essential in electrical installation to minimize the danger of electric shock due to leakage of current through undesired path. Electrical earthing is done by connecting the conductive parts of an electrical appliance or equipment to the ground and provides an alternative path for leakage current.

The building sector is responsible for significant energy consumption globally. Buildings demand energy in their life cycle from its construction to demolition. Research shows that operating energy contributes to 80-90% of total energy life cycle. Electrical engineers, as major building operators, had been putting huge efforts to reduce building energy use in the past decades.

Understanding and monitoring energy use helps to benchmark the energy performance and identify possible energy saving opportunities in buildings. Smart metering has become a global trend for building sectors. A smart meter is a device installed at the consumer's premises that measure real-time electricity consumption and allows two-way communication with the electricity provider and the electricity end-user. Smart metering facilitates real-time communication between customer and utility companies that helps to enhances consumption feedback for electricity customers. By incorporating with a display system, consumers can read their electricity usage in real-time and track their energy and cost movements with different appliances. This information allows users to understand what appliances or activities consume the most and amend the consumption patterns. Different researches indicated that user related aspects and behavioral effects cause disparity of energy use in similar buildings. Smart metering also brings benefits for the utility companies. By collecting the energy consumption data from the customers, they are able to implement more effective and reliable grid management. It also allows power companies to spread the electricity demand during "peak" periods by coupling with "time-based rates". Customers can opt to reduce electricity consumption during "peak" hours and potentially save money on their electricity bills. An evenly distributed electricity demand can reduce the use of "peak" power plants which typically have higher greenhouse gas emissions.

Lighting contributes to major power consumption in residential buildings. Besides adopting energy efficient lightings such as LEDs, optimizing lighting controls is another energy saving opportunity in buildings. Housing Authority, as the biggest residential buildings owner, had adopted a two level lighting control system in public area of domestic block since 2008 in response to the requirements laid down in the Design Manual: Barrier Free Access 2008 by the Building Department. The system consists of two lighting modes, the normal mode and triggered mode. Under normal condition, the illumination level of the public areas is kept at low level to attain minimum energy consumption. On the other hand, people with special needs such as those having impaired vision, the system enables users to raise the lighting level by pressing the lighting switch along the area. Upon activation, the lightings in the area are fully turned on to achieve the optimal illumination level for a period of time.

With the rising concern over the environment, green energy and energy efficiency had been the major focus in electrical engineering industry. Renewable and alternative energy sources are becoming increasingly important to cope with the energy crisis. Photovoltaic system, also known as PV system, had a huge progress in recent years. As the ultimate source of energy, solar power is unlimited and readily available everywhere. PV system is a power system designed to supply usable solar power by means of photovoltaic. The PV system typically comprises solar panels which convert sunlight into electricity and solar inverters to convert electric current from DC to AC. There are four major types of PV modules commonly found in the market, mono-crystalline silicon, multi-crystalline silicon, amorphous silicon cells and Copper Indium Gallium Selenium (CIGS) cells. Among all, mono-crystalline panels are the most efficient PV modules currently available in the market in terms of output wattage. However, selection of suitable PV cells depends on the need of the application. New technologies are emerging the market with better price, higher durability, flexibility and versatility which allows PV system to be incorporated into a wider choice of applications. Although solar energy has become one of the most common renewable energy sources, there are still barriers for replacing the conventional energy sources. The willingness of adopting solar power system is hindered by the high initial cost as well as the on-going maintenance cost. The uncertainty of payback period is also an obstacle for the wider use of solar power. In the future, the major challenge of electrical engineering is to implement a more efficient, flexible, reliable and economical solar modules that is effective under different operation conditions and high resistant to damages.

Electrical engineering is an essential part of our daily lives. We can hardly live without the aid of electronic devices and electrical infrastructures. The electricity demand is increasing day by day. The traditional power generation and transmission methods incurred certain amount of energy losses. Electrical engineers take a leading role to cope with the energy crisis and climate change. With the help of innovations and technologies, electrical engineers will continue to contribute with their knowledge and experiences to move the world forward.

Calligraphy Competition

中國毛筆書法大賽

為慶祝香港工程師學會電機分部成立40周年，我們分別舉辦了一系列以「程心E重薪火相傳」為主題的活動。2018年4月28日，我們舉辦了中國毛筆書法大賽的決賽，希望藉着中國書法藝術書寫有關工程的語句，提高人們對工程的興趣，同時體會筆墨情趣。比賽設有初中組、高中組及公開組。

本會很榮幸邀請了五位評判（排名按筆劃序）為當天的比賽評審：任貫中先生、吳漢榆教授工程師、馬潤憲先生、陳樂怡工程師和梁梁淑貞女士。此外，充滿深意及對電機工程的卓越成果和展望的比賽詩句，是由吳漢榆教授工程師（中學組詩句）和陳寅添工程師（公開組詩句）所創作。本會非常感謝他們的熱烈支持。


任貫中


吳漢榆


馬潤憲


陳樂怡


梁梁淑貞

吳漢榆教授工程師的創作詩句為：

紅寶石禧 四十韶華
電機分部 享譽有嘉
籌謀獻策 電網堪誇
亞洲最穩 颶風不垮
城際高鐵 電動飛車
一帶一路 連通歐亞
程心 E重 薪火傳家
（全首押麻韻）

陳寅添工程師的創作詩句為：

光暖萬家四十載
耀榮百業盛香江
電啟飛龍通寰宇
能揚代代獻興邦

註：在吳漢榆詩句中，由於英文E字在中國書法上未有標準寫法，所以刪去最後一句。

通過比賽詩句，本會希望帶出以下訊息：

1. 電力可帶給全港市民在生活中源源不絕的光照和溫暖，當中突顯電機分部在過去四十年的貢獻和成就；
2. 有可靠和穩定的電力供電網，是提供香港長期安定繁榮的基石，作為專業工程人員引以為傲；
3. 2018年香港電動高鐵快將開啟，標誌著與中國神州大地劃時代的高速聯繫，更可擴展至一帶一路的歐亞商機，彰顯電能光耀遍及寰宇；
4. 人才輩出，代代相傳，實為工程界不可或缺的重要使命和承諾，對社會作出札根性的重要貢獻。

書法大賽初賽約有七十名參賽者，經初選後有四十一名進入決賽。決賽在下午2時30分開始，決賽參賽者聽取大會的決賽規則及注意事項。他們須自備毛筆、墨、盛器、枱墊及印章；毛筆作品須書寫在大會提供的宣紙上。他們須書寫主辦機構提供之指定文稿，可自由題款及蓋印。

書法大賽比賽時間有90分鐘，參賽者即席揮毫，氣氛熱烈緊湊。參賽者的作品水平甚高，評判團經評選後即場公佈賽果及頒獎。

比賽得獎名單如下：

最踴躍學校參與獎：

保良局百周年李兆忠紀念中學

初中組

冠軍	池凱琳	保良局百周年李兆忠紀念中學
亞軍	黃浚源	保良局百周年李兆忠紀念中學
季軍	廖凱羚	香港神託會培敦中學
優異	石詠瑜	香港純藝中心

高中組

冠軍	翁以哲	高主教書院
亞軍	翁以廷	聖保羅書院
季軍	何卓承	保良局百周年李兆忠紀念中學
優異	鍾善緻	保良局百周年李兆忠紀念中學

公開組

冠軍	游豪文	
亞軍	何文娟	
季軍	馮貴納	
優異	（共8位）	
	余光雄	屈俊榮　黃少豪
	胡婉儀	唐雪芳(伊蔚)　吳哲宜
	翁仰暉	王維偉

評判團討論

籌委會和評判合照

比賽現場全境

比賽現場參賽者作賽中

評判認真評審中(馬潤憲先生)

電機分部籌委會和嘉賓合照

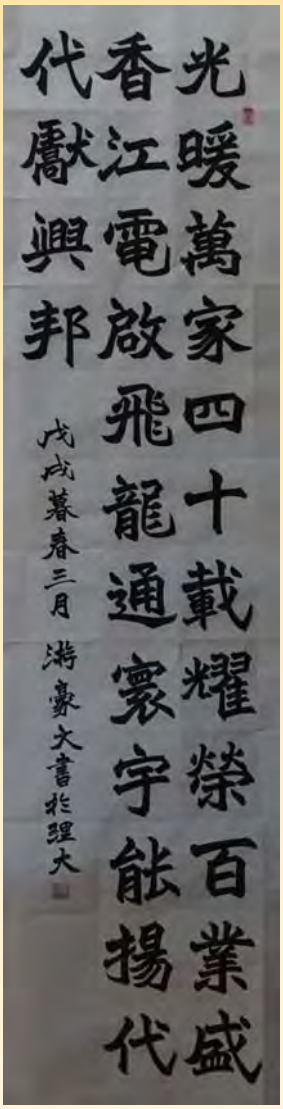
評判認真評審中(吳漢榆教授工程師)

所有得獎者、評判和籌委會大合照

公開組冠軍　游豪文

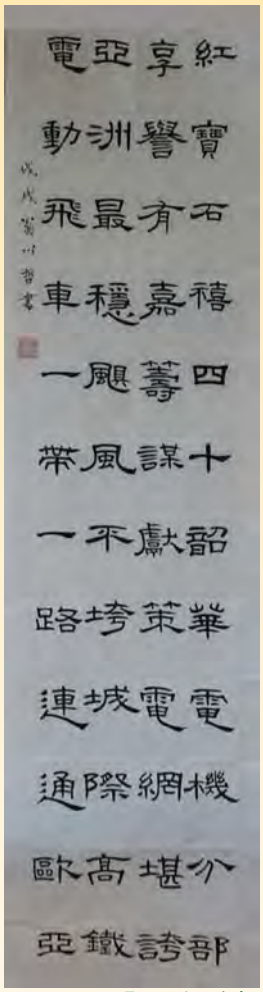
公開組亞軍　何文娟

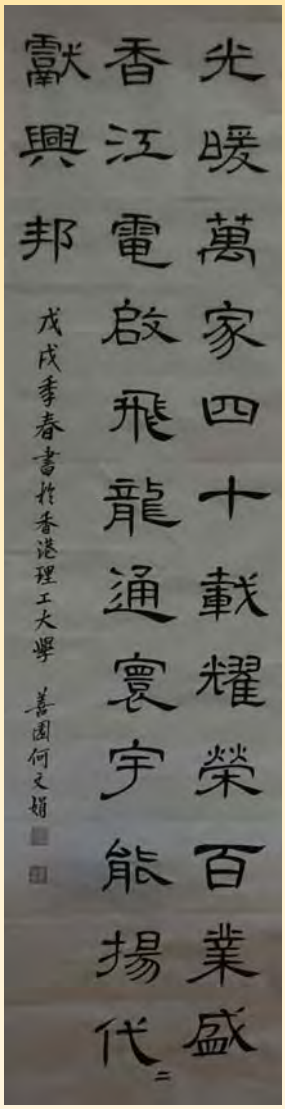
公開組季軍　馮貴納



公開組冠軍作品

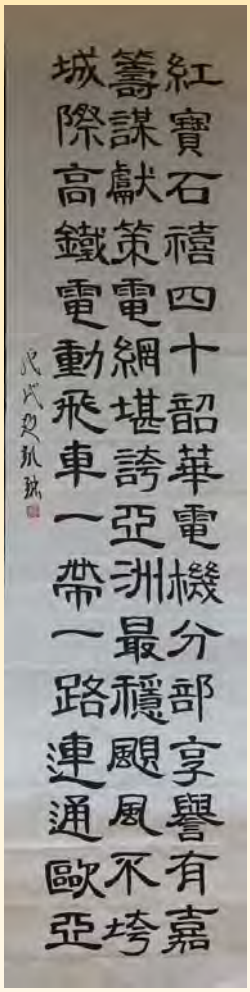
高中組冠軍作品

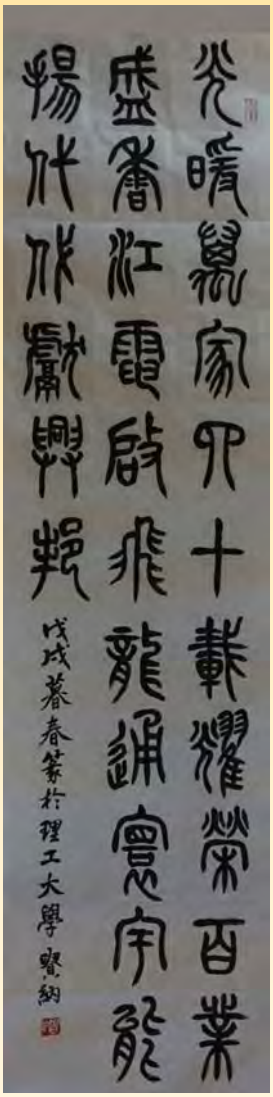




公開組亞軍作品

初中組冠軍作品





公開組季軍作品

高中組冠軍　翁以哲（高主教書院）

初中組冠軍　池凱琳（保良局百周年李兆忠紀念中學）

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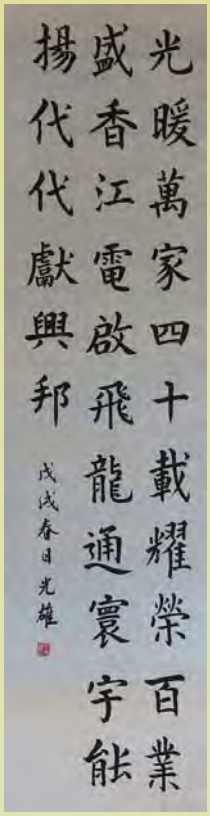
余光雄作品



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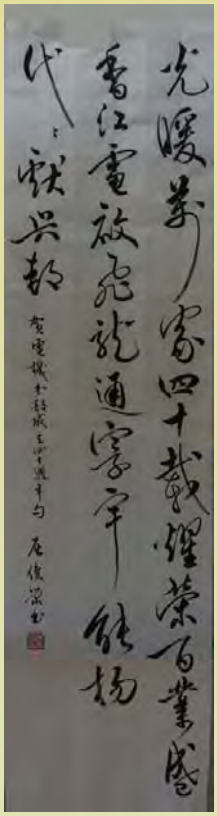
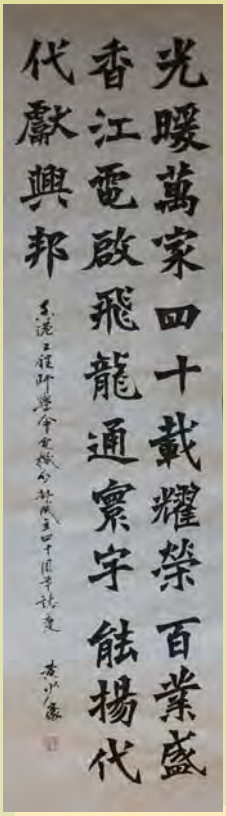


黃少豪作品



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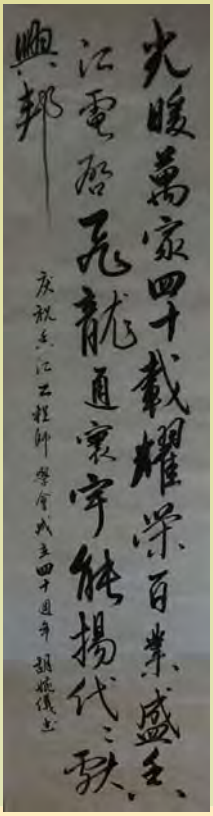
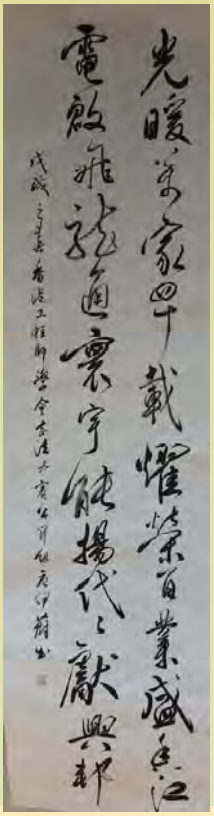


唐雪芳(伊蔚)作品



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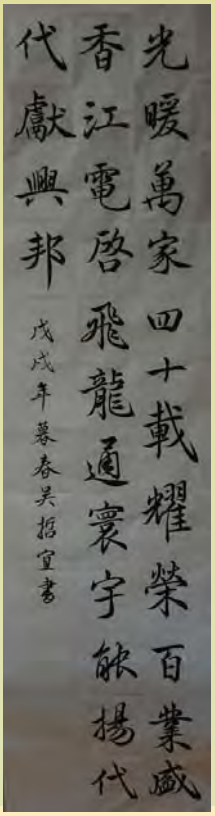
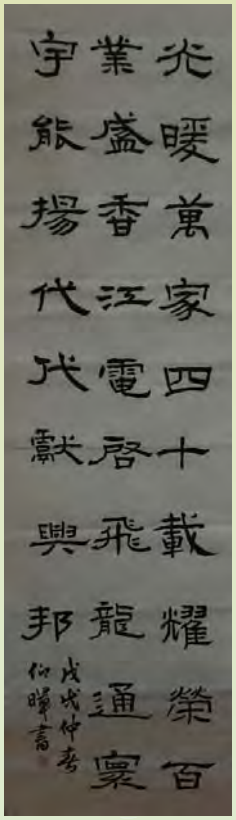


翁仰暉作品



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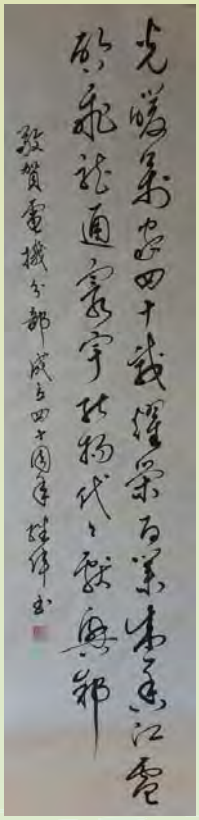

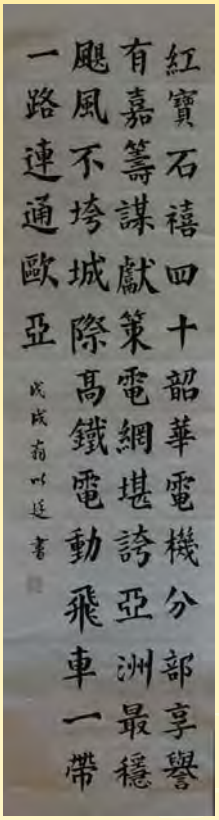

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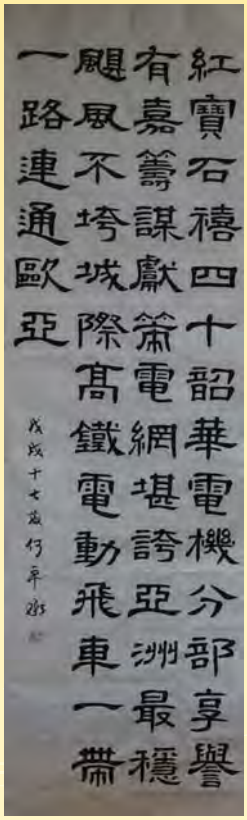

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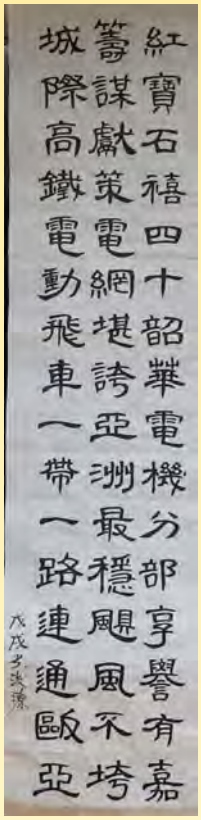
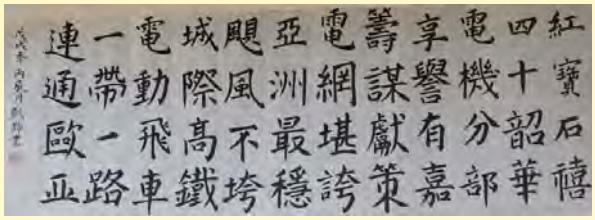
何卓承作品



初中組亞軍
黃浚源作品



初中組季軍　廖凱羚作品

40 Electrical Division
Anniversary 程心E重薪火相傳
Nurturing Our Young for Electrical Engineering

Articles for Sharing Experience

To celebrate its forty years of establishment, the HKIE Electrical Division has organised a series of activities with a theme "Nurturing Our Young for Electrical Engineering" (程心E重薪火相傳). The Division has invited submission of articles from members for experience sharing. We trust the articles have exhibiteda wealth of valuable experience to our young engineers. The invitation of article submission covers a wide variety of electrical knowledge and experience to be shared including technical, practical, operational, reliability, safety and professional development. The articles describe problems encountered and how they are being solved and conclude with lesson learned. There are 7 articles for the 40th Anniversary Special Publication to share experience and skills in the electrical engineering profession. They comprise of Power System Protection, Electrical Fault Finding in LV Systems,Investigation on Digital Protection Relays Failure, Designing Buildings of Low Carbon Footprint, Health Check of Transmission Cables, and Challenges faced by Electrical Engineer from Young to be Professional and Beyond. These articles were contributed by Ir Dr FC CHAN, Dr Shihe CHEN, Ir WI HO, Ir KW LEUNG, Mr KP LUI, Ir WS TAM and Ir SS TANG.

Protection Mal-operation in Electrical Power System

by Ir Dr FC CHAN

Protection system is a key component for the required reliability and security in a high voltage power transmission and distribution supply network. It is called upon to operate to protect the equipment from further damages rapidly and accurately when there is a system fault within its designed operating criterion. It should remain stable when there is no system fault or during a through fault condition with fault outside its protecting zone. These challenges faced by protection engineers are essential in the design, installation and maintenance of a protection system.

Protection relays have been evolved from bulky mechanical, electronic solid state to microprocessor types over the past 80 years. Each type of protection relays has its own characteristics as well as its inherent reliability and security.

There was a busbar zone protection operation in Hok Un 33kV system in the afternoon on 1 July 1983 resulting in loss of electricity supply to Hunghom area. That busbar zone system was of a mechanical type, called mono-bias protection and was manufactured by A. Reyrolle in mid 1950. By the time I arrived at the protection relay room about an hour later, the 33kV supply system had been restored. Based on the fact that there was no voltage dip being sensed and that the busbars could be reenergized, busbar protection system mal-operation was inferred. All busbar zone relays were thus taken out from the case to prevent its possible repeated mal-operation.

My immediate plan was to formulate an investigation process. Every relay was inspected to see if there was any flag dropped or loosing part internally in the relay. The wirings inside every panel were also inspected to see if there was any externally distributed wiring. After this checking, the K11 and K13 trip wires were isolated and these relays were put back for on-load test. This action prevented any tripping due to repeated mal-operation during the test for fault identification process. Spill currents were measured to ensure the relay system was stable. After putting on soak for a few days and no further abnormality was detected on the system, the final decision was whether or not to put the busbar protection with tripping (i.e. to reconnect the K11 and K13 trip wires) back to service?

In protection system, whenever there is a mal-operation, it is the responsibility of Protection Engineer to find out the cause and develop a solution to prevent its recurrence. If no root cause is identified, there is always a possibility to have another mal-operation if putting it back to the service. Such risk of mal-operation or unstable operation can be made alert to the system operation staff who operates and maintains the power supply network so that contingency measures can be formulated and adverse consequence can be minimized. However, such risk has to be removed over a period of time, as short as possible.

When a problem is to be tackled by an engineer with logical thinking, one could ask himself or herself: if an engineer with similar knowledge and skill sets, would the similar decision be made. If the answer is yes, such decision can be made as all decisions are made based on available but limited information. It rules out personal subjective preference in the decision.

With the above reasoning, the busbar zone protection was restored to service. It functioned healthily before the retirement of the 33kV network in mid 1990.

As engineers, we need to be confident on what we have decided based on our logical reasoning and technical knowledge on the subject matters. It is essential to address the risk and its mitigation measures. With the introduction of modern relays to fade out the old types of relays, it is essential to carry out new relay acceptance from laboratory testing to know the detail characteristics, trial installation to know its adaption to site environment. Training of operation staff to ensure its full understanding of the new relay information and operation. Such precaution approach is now the practice for new relay introduction to ensure the protection system is reliable and secure.

Analysis of Ferro-resonance Overvoltage during Black-start of Power Systems

by Dr Shihe CHEN

In a power system, large disturbances may lead to cascaded equipment outages or even black-out. A major function of power system operators is to restore the system to normal conditions as fast as possible. The process to restore the system from a black-out state to normal operating conditions is called black-start. As the network configurations during black-start are much different from the normal system running arrangements, a detailed study is required to assess the risks associated with each step of the black-start procedures.

The most direct way to assess the risk of the black-start procedures is by conducting field tests. However, apart from the high degree of operational risks anticipated, field tests require resources and network outages which may affect the supply reliability. Simulation study of the black-start procedures has the flexibility to analyze different network configurations and system conditions without much cost and risk. However, the accuracy of the models and hence the results are sometimes questionable. To solve this problem, a hybrid approach to assess the feasibility and risk of the black-start procedures by combining simulation study with field test was adopted.

A major risk in the black-start process is the occurrence of ferro-resonance overvoltage upon the energization of a no-load transformer. The root cause of the resonance overvoltage is the unfavorable combination of the source impedance, the shunt capacitance of the energized circuits, the non-linear magnetizing characteristics of the energized transformer, inadequate damping of the system and the source voltage phase angle at the moment the transformer is energized.

Resonance overvoltage is not commonly known as it usually does not exist in normal operating condition. It is also not possible to identify its existence by common system analysis tools using linear models for system elements. Figure 1 shows a typical waveform of resonance over-voltage recorded by site measurement. The resonance over-voltage may damage the system equipment and delay the black-start process. Therefore, detailed study of the resonance-overvoltage with special tools for the black-start procedure is required to prevent its occurrence.

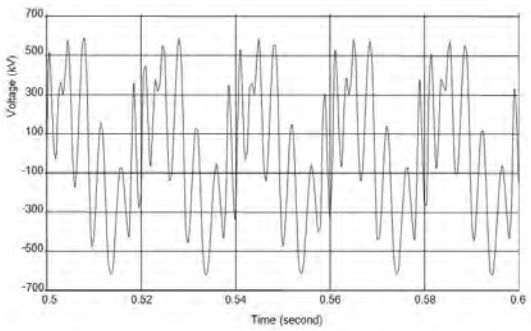


Fig. 1: Recorded waveform of Resonance Over-voltage

As computer programs using linearized system models are not capable to simulate the behaviour of the system with resonance over-voltages. The tools required for this task are mainly simulation software specialized for analysis of electromagnetic transient phenomena, e.g. EMTP. The effectiveness of the simulation analysis depends on appropriate modelling and use of parameters in the computer software. The reliability and accuracy of the simulation results have to be verified by field tests.

The first step of resonance overvoltage study includes a simulation study of a relative simple network configuration which can be tested in field. The simulation model and the study results are then verified by the field test results. With the verified models and parameters, various network configurations and system conditions are studied by further simulations to identify the causes of the resonance overvoltage and to formulate remedial measures. As field test may impose some risks to the supply reliability and equipment safety, appropriate risk mitigation measures are designed to ensure the equipment safety during the site tests.

Using the above approach, resonance overvoltage mitigation measures are identified. It is also observed that by adopting one or more of the following measures during black-start, the resonance overvoltage can be effectively reduced to an acceptable level:

1. Large transformers are energized with larger or multiple generators.
2. Carrying as much load as possible at the source side before energizing a transformer.
3. Selecting a short and hence low impedance path for energization of a transformer.
4. Reducing the system voltage before energizing a transformer, e.g. adopting the zero-voltage-start approach to energize a transformer.

In conclusion, due to the non-linear and complex characteristics of the power system elements, different tools and methods should be used to assess the potential risks in the operation of power systems. The risks of ferro-resonance overvoltage during black-start process can be assessed by electromagnetic transient analysis software to simulate the non-linear magnetizing characteristics of the transformers. The simulation models and parameters are to be calibrated against measured field test results to ensure their reliability and accuracy. Then the calibrated models and parameters can be used in further simulation studies to find out the root causes of the resonance and identify mitigation measures. The calibrated models can also be used to study other system configurations that are too difficult or too risky to test in real systems.

Carbon Emission Estimation – A Tool to Design Buildings with Low Carbon Footprint

by Ir WI HO

Carbon Dioxide is one of the gases leading to climate change, and electricity generation is one of the major sources of carbon emission. In the design of building services installations including the electrical system and lighting system, optimizing the scale could minimize the energy consumption.

The major elements of buildings, namely the concrete, steel and timber, also emit carbon during their production, the larger the quantity, the more the emission, therefore the optimum design of buildings will also minimize the carbon.

With the growth in population, new buildings are designed and constructed continuously, but the related professionals including the BS Engineer, Structural Engineer and Architect did not have a tool to inform them of the quantity of carbon emission of their design due to all aspects of the life time of buildings.

I saw the need and worked out one for the construction industry, helping to reduce carbon.

To calculate the energy consumption of a BS installation, e.g. Lighting system, the prerequisite is the knowledge of the quantity and capacity of all types of light fitting in a building, but the energy to be used in a yearly cycle can hardly be ascertained due to the uncertainty of switch-on time which is subjected to timer setting in different seasons and operation of solar sensors and motion sensors triggered by people, in other words historic figures from similar buildings shall be obtained to calculate the total energy to be consumed.

Similarly for Lift System, beside lift type and capacity, historic figures of the lift usage pattern and population in different time of a day are critical in prediction of energy use, so historic figures from existing similar buildings are vital.

Beside BS installations, all other aspects (and materials) of a building that will emit, or absorb, carbon during its manufacturing or in its life time shall also be identified and the impact calculated, apparently it's outside the scope of an electrical engineer.

To have a meaningful comparison, the life span of new concrete buildings shall also be known, which is a prediction based on historic record and latest knowledge of concrete.

As each building professional accounts for only part of the carbon emission of buildings, nobody has a holistic view covering the whole issue and a consolidated calculation did not exist, therefore chance of changing of building design to minimize carbon emission has not been grasped.

In 2009, immediately before I was promoted as a Chief Building Services Engineer of the Housing Department, I was carrying out Carbon Audit to some existing domestic buildings and simultaneously leading a team of engineers to carry out design for some new public housing developments including the Kai Ching Estate, which comprised 6 high rise domestic blocks each with different design due to site condition.

In one day an idea came into my mind: With historic figures from Carbon Audits, why shouldn't we design buildings with minimum carbon footprint?

I started to list out and calculate in details all the six aspects in the life cycle of a buildings:

- Aspect I: Carbon emission due to steel and timber consumed during construction.
- Aspect II: Carbon due to steel and concrete forming the building structure.
- Aspect III: Carbon due to energy consumption (1 kWH to 0.7 kg carbon) by all building services installations calculated with the aid of historic figures. 100 years was taken as the service life of new buildings confirmed by structural engineer.
- Aspect IV: Carbon reduction due to renewable energy installations.
- Aspect V: Carbon reduction due to trees taller than 5m (23 kg carbon per year).
- Aspect VI: Carbon emission during building demolition.

The result is that the total figures of the six blocks ranged between 45,681,000 to 63,351,000 kg CO_2, they were compared on per flat and per GFA basis, and based on these footprint the building design have been optimized to minimize the total carbon emission.

Inter-disciplinary collaboration is required to tackle most of the problems nowadays, and we Electrical Engineer have the required capability, training and knowhow on many aspects of the modern world and should go beyond our own scope, to lead the other professionals to serve the general public by offering constructive opinions and expertise advices to make our world a better place to live.

Carbon Emission Estimation has set an example, and thankfully I (Right 3 in the attached photograph) was awarded an "Extra Mile Card" by the Director of Housing.

Experience Sharing on Root Cause Finding of Digital Protection Relay Failure

by Ir LEUNG Kwun Wah

Prior to fixed-type digital protection relays massively deployed in the local 11kV distribution network, the most common type protection relay was withdrawable-type mechanical operated relays and solid state electronic operated relays. Since large amount of wires are connected to an operating protection relay, it requires to remove those wires to take a fixed-type relay out-of-service for maintenance. This is time-consuming and can introduce error when re-connecting the wires. Therefore, one key advantage of withdrawable-type relays is its core mechanism which allows to remove and put back the relays to its housing without touching any of the wiring connections.

However, with the deployment of fixed-type digital protection relays, its non-withdrawable characteristic showed conflicts with the existing practice that was more favourable in handling withdrawable types. Both the end-user company and the manufacturer had contributed remarkable efforts that finally improved the product to suit better the local situation.

This paper is to describe my lesson learnt as the supplier of a fixed-type 11kV distribution level digital protection relay.

There was a digital overcurrent protection relay introduced in the 11kV distribution network in around 2002. The relay was a single-PCB design and the PCB together with the front panel could be withdrawn from its housing, but it was not designed functionally as a withdrawable type relay. However, this unintended “feature” made a great convenience during the installation preparation works. Therefore, instead of keeping the relay intact by connecting and disconnecting the wires from every relay’s wiring terminal during relay testing, few housing were used at the testing bay and PCBs of every relay was frequently withdrawn and inserted before being put into site operation.

Digital relays are micro-processor operated, and it has a self-diagnostic feature that can “block” the relays when it sees something happen internally that can avoid the relay to perform normally. The deployed digital relays had no issue in the beginning few months until hot and humid summer. Until then, there were numerous installed relays going to “blocked” status at site, the diagnostic circuit found abnormality and no protection function could be performed.

This failure type was unprecedented anywhere worldwide, even in the South East Asia forest. Both the senior management of the relay factory in Europe and the client company were paying great attention to this case, the product development team of the factory was under tremendous pressure to find the root cause and solution.

As the power system protection responsible person, I was taking the driver seat of the remedy action team with the support of the factory experts. The immediate action was to replace faulty relays at site with new ones to resume operation and coordinate the factory for root cause identification.

The frequent withdrawal and insertion created bending force onto the PCBs and caused a damage. However, this was initially overlooked as the root cause. Instead, majority of the effort were focused on examining the quality of components that were used for manufacturing the concerned relay batch. The next significant effort was spent on the returned faulty relays - this included stress tests via numerous kind of humidity and temperature combinations, targeting to repeat the failure under a controlled environment.

The investigation divulged that a processor chip on the PCB was getting moisture via very tiny cracks in the silicon structure. The cracks were so tiny, and it did not harm the relay operation under low temperature and humidity. However, this finding was then excluded as a quality issue of the concerned component, since same batch of the same component did not exhibit same issues elsewhere. It made the case even more confusing as no root cause could be concluded.

We failed to look outside-the-box for finding the root cause. Without any excuses of giving up, the team suggested to look inside-the-box again. It was discovered that the faulty processor chip was located at near-centre of the PCB. The chip was rectangle-shaped with its longer side parallel to the direction of the insertion and withdrawal action, taking much of the bending force. The factory soon developed a revised version with enhanced supporting frame to strengthen the PCB and re-oriented most of the chips away from the bending area during withdrawal and insertion. This enhanced version showed no similar failure again since its official launch.

This case gives a new dimension of thinking regarding fault finding for protection relay. In fact, it is indispensable to include both the technical and the human aspects when solving an engineering problem. Since in most cases, the product of an engineering project, no matter whether it is a protection relay in this case or a facility such as a civil structure, people will be the end-user. People would interact with product; therefore, it should be designed with, as thoughtful as possible all the human factors to make the product fit seamlessly into the operation cycle properly.

Similarly, for fault finding, human factor pays an important part, and this is often being overlooked as in this case. User would override the original intention of any given design if there is a benefit to do so. Engineers should not underestimate this effect and to develop supportive measures to keep chances of failure as low as practically possible.

Transmission Cable Health Check with High Voltage Alternating Current Frequency-tuned Resonant System

by Mr LIU Kwun Pak

Transmission cable system serves the backbone of power network in electricity supply company. Any failure in the cable system may incur system outage and even significant power interruption which would affect supply reliability and cause inconvenience to the community.

Oil-filled cable (OFC) was the earliest cable type used in the transmission cable system at 66kV and above cable system for many decades. After 1990's, Cross-linked Polyethylene (XLPE) insulated cable has been increasingly used by power companies for new circuit installations due to the proven technology, simpler installation and maintenance, environmental friendliness for cables and accessories as compared with OFC system.

After-installation testing is current practice for checking cable integrity before the cable is put to system for energization and service by the power company. Testing OFC by high voltage direct current (HVDC) is the well proven technology and there are international standards established for the cable testing by power companies for some decades.

Since XLPE cable was introduced by the power company, HVDC has been used for testing OFC, XLPE and OFC/XLPE mixed cable circuits. However, there were some failures occurred on newly installed XLPE cable circuits during the after-installation testing and after short time of service of the cable in system as well. It was found that the HVDC testing was less capable of revealing voids or cavities left inside the accessories after assembly, such as XLPE joints and terminations.

Hence, effective after-installation testing was required to check and ensure the cable integrity. According to the bathtub curve which is widely used in reliability engineering, early "infant mortality" failure could be happened due to the following factors: -

(a) Possible defects escape from routine test in factory
(b) Damage to cable during site installation
(c) Inadequate workmanship of accessory assembly

In view of the cable failures, remedial actions were required to ensure the cable integrity and maintain the circuit availability.

Having appraised the situation and problem size e.g. cable failure rate, root causes of fault and number of testing required to carry out in the upcoming months, some ways in exploring the remedial solution were identified. The ways included searching for the latest and sophisticated technology of cable testing, bench marking of testing method being adopted by other leading power companies in the world, testing XLPE cable with system voltage instead of HVDC testing.

All in all, the following remedial solution was concluded and implemented: -

(a) XLPE cable testing with HVAC - some power companies in Europe and North America performing HVAC testing on new 50-150kV cables with a voltage of 2.0 to 1.1 Uo for 10 to 60 minutes. It was considered as best practice for XLPE cable testing in early 2000s.
(b) HVAC testing set was available from the market. However, the testing set is big and needed to be accommodated in large lorry for mobilization and testing in electric substation. To minimize the power required to testing long cable circuit of several km, Frequency-tuned Resonant System was selected and the difficulty in mobilization and accommodation of testing set was reduced.
(c) For those XLPE cable circuits which is impracticable for HVAC testing due to long cable length and limited space at testing location, adopting system voltage for the testing would be considered.

Subsequent to the implementation of HVAC testing, XLPE cable defects and failures have been identified. It encouraged necessity of testing XLPE cable with HVAC. Also, Frequency-tuned Resonant System was practical for testing XLPE/mixed cable circuits in the transmission network.

Notwithstanding the implementation of HVAC testing in the power company, some lesson learning points could be summarized below for sharing.

(a) Management of Change (MOC) is important before new equipment/ work practice is introduced.
(b) Higher voltage and very long XLPE cable is expected to be installed in the power company in the future. Necessity of testing long XLPE cable at extra HV level would be soon a challenge.
(c) As a continuous improvement, after-installation test together with partial discharge measurement would be a crucial supplement to ensure cable integrity.

Door for Electrical Engineers

by Ir TAM Wing Shing

It is challenging to lead young people going to the door of electrical engineering.

"To be an engineer" may be the topic of "Your Wish" of essay during the time you were at school. However, you might not specify in which engineering discipline of engineer you want to be in your future career in your writing. Most students or graduates may not have any ideas or sufficient practical knowledge about the engineering work even after they completed the course from college or university. For instance, a student completed rigorous course of Electrical Engineering including complicated and tedious mathematics such as Laplace Transform and Second Derivative Calculus and the forced feeding science. However, most of the electrical knowledge learned from university may not be applied in his or her jobs except for Ohm's Law. It is always said that graduate is just like a piece of white paper. Another set of technical skills need to be learnt again at the beginning of the works to suit. There is no exception for me. I learnt computer aids design (CAD) to replace the techniques I acquired over 30 years ago (using refill technical pens and T-square for drawing preparation, typewriter for document preparation, etc). Building Information Modelling (BIM), which is next wave for drawing preparation to replace CAD, is the skill that I am still learning today.

What inspired me to be an electrical engineer was due to an electrical incident that happened at my home when I was a teenager. Electricity supply was interrupted due to that incident and the fuse was blown out. Replacement of the fuse in the past was not as easy as today by just resetting toggle of main MCB switch. Rewireable type fuse was used as circuit protection device at that time. I attempted to fix the damage by my very limited electrical knowledge and replaced the wire of blown out fuse. Unfortunately, result was even worse and the fuse was blown out again and both live and neutral wires were also burnt. It might be due to inadequate wire size or improper fixing method of the wire replacement that I applied to it. Eventually the damage was fixed by an electrical technician with reimbursement of cost. I recognized the failure and decided to learn something related to electrical technology.

I have been participating in Professional Drive with colleagues of HKIE Electrical Division to promote electrical engineering to the students of IVE, Polytechnics and universities. I introduced job opportunities, shared my working experience and briefed nature of work I am doing. Hong Kong students are usually hesitant to initiate and share their problems with others during the talks. It is difficult to know whether they are interested and understand the details we shared. Sometimes, the students surrounded you for questions after the talk was adjourned. I would have preferred that these questions were raised during the talks so that information can be shared with the whole audience, and I could provide them with appropriate guidance to the path of an electrical engineer accordingly.

Taking the role of Mainland Technical Visit Sub-committee member since 2011, it is still challenging for me to successfully enroll more young engineers to join the annual technical visits to China. I organized a number of technical visits to different places and cities in China from 2011 to now including visits to rarely seen places such as power substation at highest altitude of the world in Tibet, the largest solar power plant and various types of sustainable power plants in different cities of China. However, young engineers' participation is still highly expected. Perhaps the young generation still have a misunderstanding of China, believing she still has poor sanitary conditions in areas of drinking water quality, dirty half open toilets, food made of gutter oil, coarse rice in yellow, etc., As a matter of fact, the conditions are greatly improved in most cities of China today. I should have to work harder in this aspect.

Some parents may educate their children by saying "don't take this profession as your career like I do". It may be they have a mindset that their jobs are boring, or the workload and responsibilities are not equivalent to their pay. The situation actually differs now in the field of electrical engineering. When I began my works for the E&M consultant firm over 30 years ago, there were not many female engineers particularly in my engineering firm. Ratio between male and female engineers was about 10: 1 at that time, and now it has been increased to 10:3.

Even though soliciting young people to the field of electrical engineering is not an easy task which I am working along with colleagues of Electrical Division, it is encouraging that I see many young engineers joining the Electrical Division and doing great jobs to promote the field of electrical engineering today.

Disconnection of the Neutral in an Unbalanced Three-Phase Four-Wires Supply System

by Ir SS TANG

This paper shares a case study on how to use the electrical theory to enforce the others to work with you to rectify the defects in order to comply with the Electrical (Wiring) Regulations. This case happened in the late nineties but the experience is worth discussing because its methodology is still applicable to solve similar situation today.

It was reported that a big Chinese Restaurant located in a large shopping mall in Hong Kong had invited a Registered Electrical Contractor (REC) to carry out the mandatory periodic inspection and testing on fixed electrical installation under the Electricity Ordinance. It was the first time for the restaurant to do the detailed inspection for its electrical installation in order to comply with the safety regulations.

After the inspection and testing, it was found that there were numerous defects on the fixed electrical installation which demanded rectification in order to meet the requirements of the Electricity (Wiring) regulations. One of the most significant defects was that the Earth Fault Loop Impedance (Zs) exceeded the maximum permissible value for tripping the main switch in an acceptable time. In this connection, an Inverse Definite Minimum Time Lag (IDMTL) relay was recommended to be installed to ensure the main switch of the installation could be tripped in a safety time when earth fault occurred.

After the installation of IDMTL relay, it was activated and tripped the main switch of the restaurant frequently at around 10:30 to 11:00 and random time in the afternoon every day. Fortunately, there were two electricity supply sources for the restaurant; as such the impact was limited to only part of the areas in the restaurant.

After detailed checking and data recorded, it was identified that the leakage current measured at the point of the main switch was abnormally high at the time mentioned above. It showed that there was a relatively big difference between the current flowing along the live and the neutral conductors. In normal condition, the algebraic sum of the current flowing through the live and neutral conductors should be zero. Therefore in this case, it could be concluded that some shops in the shopping mall nearby the restaurant had shared the same neutral conductor with the restaurant, but with different supply sources. Therefore it would lead to the result of such unbalanced current flowing between the live and neutral conductors.

Originally the problems could be rectified by simply asking the property management of the shopping mall to rewire the neutral conductors of the associated shops, so that the restaurant could have an independent neutral conductor. However, the property management refused to do any work unless the REC could prove the incorrect connections of neutral conductors with detailed evidence. It was really an extremely difficult task and unreasonable to the REC as the electrical installations and wirings did not belong to the restaurant and they were managed by the property management. The REC did not have the authority to carry out any works (including measurements) on those installations. Furthermore, the REC had no information about the route of the wirings, especially those installed inside the walls or ceilings located in the shopping mall.

When the REC felt anxious and frustrated in solving this problem, the author wrote an official letter on behalf of the restaurant to the property management. The letter stated that the REC would turn off the main switch of the restaurant at a specified time in the afternoon on a specified date (two weeks after the date of the issued letter) and the neutral conductor would be totally disconnected from the supply inside the restaurant for an hour. The letter indicated clearly that it was an advanced notification to the property management and the REC would not bear any responsibilities if there were any danger happened in the shopping mall in relation to the electrical installation after the REC disconnected the neutral conductor inside the restaurant.

The REC had not received any reply from the property management since then. However, the leakage current monitoring meter installed in the restaurant showed that the leakage current (the difference between the live and neutral conductors) was decreased steadily day by day. Just after a week's time, the leakage current was reduced to an acceptable and healthy value which would not activate the IDMTL relay to trip the main switch. It was concluded that the problem was rectified.

Lesson Learned:

1. If the maximum earth fault loop impedance is found exceeding the maximum permissible value, measuring the leakage current is the immediate work at first priority before further action should be taken.
2. It was obvious that the property management had done some works to re-connect the neutral wires for the shops near the restaurant. The principle behind was that the neutral point of the supply system for the shops would be shifted if they shared the same neutral conductor with the restaurant which was disconnected. The shift of the neutral point would cause an unbalanced phase voltages to the shops which might burn or even cause fire due to the occurrence of the high single phase voltage.

Dragon Boat Race

香港工程師學會電機分部為慶祝成立40周年，特贊助由沙田體育會主辦之2018沙田龍舟競賽。並以具名及主場(第十六場賽事)身份，邀請業界友好競逐『香港工程師學會電機分部40周年紀念杯』。主場隊伍由香港工程師學會龍舟隊作代表。其餘獲邀請的隊伍分別為香港理工電機及電子工程校友會之理小龍龍舟隊、金城集團有限公司之金城康體會龍舟隊、香港鐵路有限公司之港鐵公司龍舟隊、機電工程署之機電工程署龍舟及划艇會龍舟隊、中華電力有限公司之中電龍舟隊、禮頓機電有限公司之禮頓龍舟戰隊和力佳工程有限公司之力佳工程龍舟隊。

地點:沙田城門河

日期:二零一八年六月十八日

時間:上午八時十分至下午一時正

第十六場賽事:『香港工程師學會電機分部40周年紀念杯』

香港工程師學會龍舟隊


理小龍龍舟隊


金城康體會龍舟隊


港鐵公司龍舟隊


機電工程署龍舟及
划艇會龍舟隊


中電龍舟隊

禮頓龍舟戰隊


力佳工程龍舟隊

40th Anniversary Celebration Dinner
with Choir and Special Performance

The Hong Kong Institution of Engineers Electrical Division organized a dinner function to celebrate its 40th Anniversary on 19 June 2018 (Tuesday). Usually, our Annual Dinner is served as a platform for our fellow engineers to meet each other, an opportunity for good networking. This 40th Anniversary dinner, in particular, highlighted the achievements of our Division over the past decades. A theme "程心**E**重之夜" was chosen for the Celebration Dinner with 2 specially designed programme: the Choir and the Talk Show.

Time (pm)	HKIE Electrical Division 40Y Celebration Dinner Programme
7:30	Opening Speech by Ir Dr Edward LO, Electrical Division Chairman
7:45	Special Talk Show 1 – "Achievement" (成就)
8:30	HKIE EL Division Toasting
8:35	Special Talk Show 2 – "Contribution" (豐功)
9:10	HKIE EL Division Choir (我的驕傲, 天工)
9:20	Special Talk Show 3 – "Greatness" (偉績)
9:35	Lucky Draw
9:50	Closing Speech by Ir TK CHIANG, Dinner OC Chairman

To chant our successes, the HKIE Electrical Division Choir Team was formed for celebrating the 40th anniversary of Electrical Division. Championed by Ir Dr Ken CHAN, the Choir Team consists of engineers and professionals from various sectors in the industry, including utilities and government bodies. The Team went through an intensive training offered by Ms Michelle LAM, who successfully equipped all the Choir Team members with the essential choral singing techniques in a short period. Ir SK LAU was invited to be the conductor, who would lead the Team to perform two songs to celebrate the 40th anniversary of Electrical Division in a sensational way.

To illustrate our successes, a Special Talk Show Performance would be given at the Celebration Dinner. Ir CS HO would take the role as "Golden MC" to direct the Talk Show "成就豐功偉績篇" consisting of six sessions:
"成篇" Guest MCs: Ir YK CHU & Ir Gary KO
"就篇" Guest MCs: Ir TH LO & Ir Edward YEUNG
"豐篇" Guest MCs: Ir Alex FU & Ms Candy LEUNG
"功篇" Guest MCs: Ir Dr Ken CHAN & Ir Mandy LEUNG
"偉篇" Guest MCs: Ir PK CHAN & Ir TH TAI
"績篇" Guest MCs: Ir Bryan PONG & Ir Albert TO
Each session would accompany with a short video to highlight our Electrical Division's "Achievement", "Contribution" and "Greatness"!

An exhibition, for Electrical Division's 40 Anniversary Photo Competition winning photos and Ir TH LO's selected 42 photos taken during HKIE Electrical Division overseas visits, is at dinner reception area.

HKIE Electrical Division Choir Team

Soprano: Jasmine CHAN, Jenny LIN, Candy LEUNG, Winnie YEUNG
Bass (Female): Melody YANG, Venus TAM, Yani KO, May LUI, Fanny YEUNG, Sally LEUNG, Karen Man, Suki WONG
Tenor: Ken CHAN, Antonio TAM, David LI, Edward YIP, Thomas CHU
Bass (Male): Stan MOU, Steven YANG, Chester LEE, Herman NG, Kit CHAN, Paul CHAN, Joe LO, Smith TSAI

40th Anniversary Dinner Organizing Committee

Ir TK CHIANG (OC Chairman)
Ir Dr Edward LO (Division Chairman)
Ir Tony YEUNG (Division Honorary Secretary)
Ir YK CHU (Division Honorary Treasurer)
Ir Dr FC CHAN (Deputy Chairman)
Other OC Members:
Ir Hugo CHAN, Ir Dr Ken CHAN, Ir Kit CHAN, Ir Alex FU, Ir Ian LEE, Ir Joseph CW LEUNG, Ms. Candy LEUNG, Ir Vincent LEUNG, Ir Raymond SZE, Ir SS TANG, Mr. Smith TSAI, Ir CL WONG and Ir Andrew YAN

The ICEE International Conference

The International Conference on Electrical Engineering (The Conference) is an annual event aiming to provide a platform for sharing knowledge, experience and creative ideas among international electrical engineers with a focus on Asia, to contribute to technical development in electrical engineering.

The first Conference was held in Korea in 1995. After that, the four co-organisers, i.e., the Chinese Society for Electrical Engineering (CSEE), the Hong Kong Institution of Engineers (HKIE), the Institute of Electrical Engineers of Japan (IEEJ) and the Korean Institute of Electrical Engineers (KIEE) take turn to host the Conference. The Institution hosted the Conference in 1999, 2003, 2007, 2011 and 2015 in Hong Kong. Over the years, the Conferences were well supported by our key sponsors: CLP, HK Electric and MTR.

Korea	1995	1998	2002	2006	2010	2014	2018
Hong Kong		1999	2003	2007	2011	2015	2019
Japan	1997	2000	2004	2008	2012	2016	
China	1996	2001	2005	2009	2013	2017	

The Journal of International Council on Electrical Engineering (JICEE) is the signature publication of International Council on Electrical Engineering (The ICEE) which is published on a quarterly basis starting from January 2011. Each co-organiser will select about 20% of the accepted papers of each Conference from its own region for publication in the JICEE.

The ICEE 2019 Conference will be hosted by the HKIE in Hong Kong during 3 - 6 July 2019. The theme of the Conference is "Towards Intelligent Electrical Engineering". Please support by contributing quality papers. The key date for Abstract submission will be on 30 November 2018 and full paper submission will be on 31 Mar 2019.

The ICEE 2019 Conference

Hong Kong 3-6 July 2019

2019 Hong Kong

http://www.hkie.org.hk/icee2019

Call for Papers

Organised by HKIE

Co-organised by CSEE IEEJ KIEE

The International Council on Electrical Engineering (The ICEE) 2019 Conference aims to be a premium forum for sharing information, creative ideas, expert knowledge and experience among electrical engineers of the world. Since 1995, ICEE has been successfully held once a year. The Hong Kong Institution of Engineers (HKIE) is pleased to announce The ICEE 2019 Conference will be held from 3 to 6 July 2019 in Hong Kong. The theme of 2019 Conference is "Towards Intelligent Electrical Engineering", reshaping a better electrical engineering. It is a great pleasure for the HKIE, together with co-organisers, The Chinese Society of Electrical Engineering (CSEE), The Institute of Electrical Engineers of Japan (IEEJ) and The Korean Institute of Electrical Engineers (KIEE), to invite potential authors to submit quality papers in the following areas:

Topic 1: Intelligent Power Grid and Operations
- Emerging transmission and distribution technologies
- Monitoring, control and analysis of smart grid and micro-grid
- Intelligent power system protection, stability analysis and management
- Power generation technology
- Power system economics, energy market and strategy
- Modelling and simulation

Topic 2: High voltage engineering, HVDC and FACTS
- HVDC systems design, control, protection and operation
- FACTS and power quality
- High voltage equipment and insulation technologies

Topic 3: Energy Internet and Energy Systems Integration (EI2)
- Modelling, simulation and design of EI2
- Planning, operation, control and management of EI2
- Emerging key facilities of EI2 (energy router, energy Hub, energy storage, electrical vehicles, wireless energy transfer, DC networks, etc)
- Enable techniques on information and communication for EI2(cloud computing, big data, Internet of things, artificial intelligence, blockchain, etc)
- Cyber-physical system and cyber security for EI2
- Global energy interconnection
- Urban energy transition, energy internet for smart cities
- Business model, market and related energy policies for EI2

Topic 4: Intelligent Technologies for Electrical Engineering in a Smart City
- Big data techniques
- Internet of things technologies
- Deep learning trends
- Communication systems applications
- Information technology and cloud computing applications
- Modern building management
- Intelligent buildings

Topic 5: Renewable Energy Resources and Environment
- Renewable energy technology and equipment
- Energy storage and efficiency enhancement
- Energy management and sustainable environment
- Solar, wind, fuel cell and nuclear energy sources

Topic 6: Electrical Transportation
- High speed and city railway
- Electric vehicle technology
- Charging technology

Topic 7: Power Electronics and Electrical Machines
- Converter and inverter technology
- Industrial control and automation
- Micro machines, modern machines and drives

Topic 8: Electrical Appliances
- Lighting technology and equipment
- Escalators, UPS and air conditioning technology
- Smart appliances for intelligent buildings
- Energy saving and regulations

Topic 9: Materials, Electrophysics and Sensors
- Battery technology
- Materials for electrical and electronic applications
- Breakdown and discharge
- Semiconductor, MEMS and sensor technology

Topic 10: Other Related Areas
- Electrical engineering education
- Government policy for electrical engineering development
- Electrical engineering project management

3 Special Tutorials for Young Engineers
- Ace your presentation skills
- Enhance your paper writing skills
- Key elements for career success

Please visit the website for more updates: http://www.hkie.org.hk/icee2019

Submission of Abstracts: Interested authors are invited to submit abstracts of not more than 500 words for review via the online system at the ICEE 2019 website by **30 Nov 2018** .

Notification of Acceptance of Abstracts: All submitted abstracts will be reviewed by the ICEE 2019 Programme Committee. The result will be sent to the corresponding authors via email by **22 Feb 2019** . At the same time, the author's kit and detailed instructions for preparation and submission will be announced on the ICEE 2019 website.

Submission of Full Papers: For accepted abstracts, authors are required to submit full papers for final approval via the ICEE website by **31 Mar 2019** .

Notification of Acceptance of Full Papers: All submitted full paper will be reviewed by the ICEE 2019 Programme Committee. The result will be sent to the corresponding authors via email by **15 Apr 2019** together with detailed instruction for presentation preparation and a preliminary programme will be announced on the ICEE 2019 website. At least one author of each paper should complete the registration with payment by **15 May 2019** for the paper to be published in the Conference Proceedings. Each registered author can publish up to TWO papers in the Proceedings. Conference registration will be accepted online at the ICEE 2019 website.

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Energy Innovation for Smart City Project Competition

智能都會創新能源設計比賽

「智能都會創新能源」設計比賽自2009年起舉辦，今年已到了第九屆。2009年開始時原名為「創新能源項目」設計比賽，目的是提升社會對節約能源的意識和提高能源效益的認知，以及讓年青一代有機會學習和應用智能科技相關的知識、發揮創意。2016年易名為「智能都會創新能源」設計比賽，以配合近年發展智慧城市的世界趨勢，為比賽加添新的元素，令比賽更具活力。

比賽由香港工程師學會電機分部與中華電力有限公司合辦，教育局和香港理工大學協辦，並得到機電工程署及香港津貼中學議會的支持。比賽以高中學生為對象，參賽隊伍由四位學生組成。每隊需提交項目計劃書，經過第一輪的選拔，入選的隊伍均獲得中華電力有限公司資助上限為港幣20,000元的製作費用，實踐他們的創作意念，在約四個月內將構思製成作品，進入第二階段比賽。每年約有三、四十隊入選。籌委會亦會為入選隊伍安排專業工程師擔任指導顧問，為項目提供意見。並安排技術講座及參觀，以加強同學對節能和能源效益的認識。


參觀機電工程署總部


參觀中電「綠適天地」


頒獎後大合照

為鼓勵學生發揮創意，參賽作品形式可為模型、推廣教材、電腦遊戲及影片等；籌委會並建議隊伍採納或融入多方面的技術及知識，例如工程、環保、資訊科技、多媒體、材料科學等。歷年的學生作品都非常多元化，包括有電動車、智慧能源管理、太陽能電池新材料、低碳燃料製造、轉廢為能、機械人、AR和VR遊戲等等，足見學生們科技創新的潛能。

每年的參賽作品中，有10組可以進入總決賽。他們需再參加面試，向不同界別專家代表組成的評審委員會，演示及介紹他們的作品。由評審委員會選出冠、亞、季軍及其他各項大獎。2016/17年度的得獎名單如下：

獎項	學校	參賽項目名稱
冠軍	五育中學	餸頭餸尾能源球
亞軍	裘錦秋中學（元朗）	載人電動直升機
季軍	聖公會聖馬利亞堂莫慶堯中學	Go步Warming
最有創意獎	聖公會李炳中學	未來汽車擾流器
最佳演繹獎	香港道教聯合會圓玄學院第二中學	不需用電的保鮮箱
最具教育意義獎	梁式芝書院	能源瘦身計劃
最佳工藝獎	廠商會中學	可再生能源感測盒
最具潛質獎	英皇書院	人工光合作用
「High Like」作品	香港管理專業協會李國寶中學	智環保道路系統

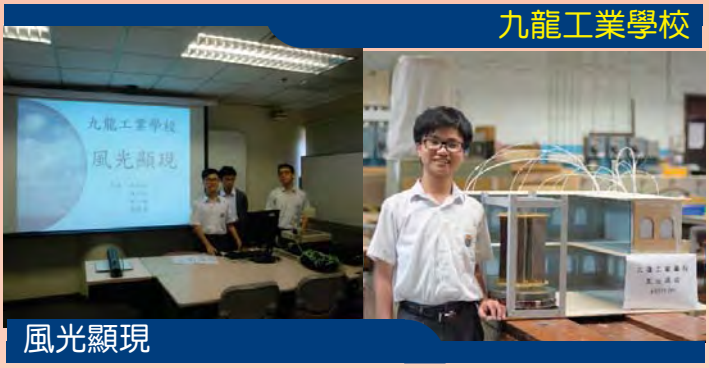

2016/17年度冠軍五育中學 日本沖繩遊學之旅

歷界比賽的報名及入選隊伍一覽表

年度	報名隊伍	入選隊伍
2009/2010	58	28
2010/2011	108	38
2011/2012	85	47
2012/2013	97	31
2013/2014	80	30
2014/2015	78	34
2015/2016	71	28
2016/2017	72	30
2017/2018	101	39

2017/18年的入圍隊伍如下：九龍工業學校(風光顯現)，九龍真光中學(神奇冰屋)，五育中學(綠源仙藻)，伊利沙伯中學(冰源不絕)，裘錦秋中學（元朗）(智能電動車)，伯裘書院(Try my Home VR)，宣道會陳朱素華紀念中學(水上可持續發展農場)，英皇書院(光能發電 金銀同催)，香港道教聯合會圓玄學院第二中學(中央藍牙節能管制系統)，嗇色園主辦可譽中學暨可譽小學(手機充電節省寶)。 比賽結果將於7月4日的頒獎典禮上公布。10組入選總決賽隊伍需準備一段簡介他們作品的短片，上載到中電綠適天地的Facebook，讓其他人在網上投票選出最喜愛的作品。

九龍工業學校



風光顯現

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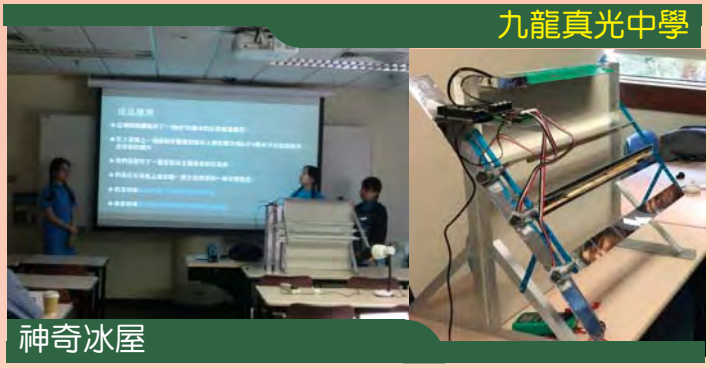

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Try my Home VR

宣道會陳朱素華紀念中學

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英皇書院

光能發電 金銀同催

香港道教聯合會圓玄學院第二中學

中央藍牙節能管制系統

嗇色園主辦可譽中學暨可譽小學

手機充電節省寶

Electrical Model Design Contest

The Electrical Division has long been active in promoting electrical engineering to the public and students of all levels. In its quest to accomplish this mission, many initiatives have been implemented in the past years, from ambassador visits, career talks to competitions. Among these initiatives, most of them were targeted to or designed for higher secondary schools or degree course students who have chosen science or engineering as their careers. For lower-form students, very few engineering-related activities, not to mention electrical engineering, are designed for them. Since lower-form students are usually at their stage to develop their own interest for future development, the Division considers that it is important to let them understand the interesting fact of engineering and the role of engineers in our society such that students could consider engineering as their lifelong career when they pursue further of their education. In view of this, the Division began a promotion project with lower-form (i.e. F.1 to F.3) secondary school students as their target. After much research and deliberation among fellow engineers and teachers, a competition in form of designing an electrical machine was considered interesting and educational.

The first competition was held on 12 Feb 2012 at Southorn Playground with wind energy as the main theme in which students were required to build a wind turbine to harvest the most energy from an oscillating artificial wind source. To ensure fair competition among participating teams, the team has to build their model with an expenditure limit of HK$1,000. This cost will also be fully reimbursed to each team as a token of our support to their participation. The competition received a huge success with 58 schools joining the competition. With the generous sponsorship from E&M industrial leaders, we were even able to arrange the winning teams to visit a wind farm in Yunnan, China.

This overwhelming result had reinforced our belief that many Hong Kong students love engineering. With suitable stimulation and encouragement, they will find engineering interesting and will consider engineering as their lifelong career. In fact, we have received feedback from some students that they have chosen engineering when they pursue their higher education.

In view of the very feedback and support from secondary schools, the Division has decided to continue this competition which has become one of the annual flagship programs of the Electrical Division. In fact, many schools are also very keen on this competition and they participate in the competition every year. We also promoted the competition to Education Bureau to improve its popularity among secondary schools. Since this contest is in line with the STEM education promoted by the HKSAR Government, Education Bureau has accepted our invitation as one of our supporters to this event. To heighten the professional status of this contest, we have also invited the Electrical Engineering Department of the Hong Kong Polytechnic University to be our supporter to provide technical advice and venue support to this event. In addition, engineers from different government departments and industrial sectors are invited as the members of the adjudicating panel.

2013 Competition at Low Carbon Building

To maintain the interest of students and to keep this competition challenging, themes are also changed regularly. In addition to wind power, hydropower was also used as one of the themes in which students were required to design a water turbine to harvest the most energy from a fixed volume of water at fixed head. In the recent competitions, we used solar energy as our theme in which students were required to design a solar charging system and electric car. The car with the most work done under a specific charging condition will be the winner. In addition to overall winners, we also present awards to those teams with outstanding presentation, workmanship, creativity and even micro-movie creation such that different talents of the student would be recognised.

Water Turbine in 2014

Group Photo of 2014 Winners

Competition in 2016 using solar power

Since 2012, the Division has organised this event annually. 2018 is the 7th year that we have organised this competition. Over the past 7 years, more than 200 schools with over 600 students have participated in this competition. Among these schools and students, we are so delighted that apart from traditional grammar school or technical schools, some special schools also joined this competition recently and their results are amazing. We are all impressed by the hard work and talents of these students although they were born less fortunate than the others. Their participations and smiling faces are truly our encouragement to continue this competition for our lower-form students.

2018 Electrical Model Design Contest

For the competition held on 6 May 2018, there were 30 schools with around 100 students participated. The winner of the Electrical Model Design Competition 2018 were:

Champion: Hong Kong Christian Service Pui Oi School
First Runner-Up: Kowloon Technical School
Second Runner-Up: Fukien Secondary School
Merit Awards (3 Schools):
Pui Shing Catholic Secondary School,
NLSI Peace Evangelical Secondary School and
Buddhist Sin Tak College.

It is to note that this year Champion was won by a Special School - Pui Oi School!

Champion: Hong Kong Christian Service Pui Oi School

Group photos of winners

First Runner-Up: Kowloon Technical School

Second Runner-Up: Fukien Secondary School

2018 Electrical Model Design Contest Group Photo

Electrical Division Professional Short Course

The Professional Short Course in Electrical Engineering is a series of classes designed to cover different aspects of electrical systems in Hong Kong which are under active development and discussion. They are targeted at engineers, both experienced and young, from different sectors of the electrical industry who seek to refresh or acquire emerging knowledge of the focus topics in electrical engineering. Facilitated by subject experts in practice, the professional short course will benefit the participants by learning through practical design experience sharing and case studies.

This Professional Short Course was first introduced to our members in session 2010/2011. As of today, the course has been conducted for its 8 consecutive years and attracted over 2000 participants. At the end of each class, an assessment is also carried out and the participants with the highest score in each class will be invited to the HKIE Electrical Division Annual Dinner to receive a certificate and cash coupons. A list of courses organised from 2012/13 is as shown below:

2012/2013:
Class 1 – Green Lighting - LED fundamentals, standards and applications
Class 2 – Railway Traction and Overhead Line Systems
Class 3 – Innovative Protocol for Building Energy Audit
Class 4 – New Engineering Contract

2013/2014:
Class 1 – Electric Drive for Railway System in Hong Kong
Class 2 – Data Center Design
Class 3 – PV System and Connection to Grid of Small Renewables
Class 4 – Protection Systems of Power Distribution in Hong Kong

2014/2015:
Class 1 – Overview of Modern Electric Vehicle Technologies
Class 2 – The Building Energy Efficiency Ordinance and Its Codes
Class 3 – Fault Analysis and Its Application Using Computer Simulation
Class 4 – Requirements of Distribution Substation for the Hongkong Electric Co. Ltd

2015/2016:
Class 1 – LED Lighting - LED fundamentals, standards and applications
Class 2 – Smart Grid - A Revolutionary Undertaking In Power Grid
Class 3 – Green Building Design – From Design, Construction to Facility Management of a High Quality Sustainable Building
Class 4 – EV Charging Technology and Charging Facilities Development in Hong Kong

2016/2017:
Class 1 – Electrical Traction and Overhead Line System
Class 2 – Wireless Power Transfer Technology
Class 3 – Mission Critical Facility Design
Class 4 – Experiences Sharing in Erecting EV Charging Infrastructure in Hong Kong

2017/2018:
Class 1 – Pioneering BIM Application in Hong Kong for Enhancing Buildings Operation and Maintenance
Class 2 – High Tier Data Centre Design
Class 3 – Technical Solutions to Deal with Climate Change - Key Consideration of Grid connection of Renewable Energy System
Class 4 – New Development of Vertical Transportation Systems in Buildings

Messages from The HKIE Electrical Division Past Chairmen

My warmest congratulations to the Electrical Division on its 40th Anniversary! Over the years, the Division has organised ample activities with unfailing efforts to promote electrical engineering to both professional sectors as well as the public at large. It is no doubt that the Division will continue to serve its members with excellence in the years ahead.

HO Sai King

Electrical engineering, in every corners of the world, has been the foundation stone to knowledge and innovation. The Electrical Division of HKIE has demonstrated remarkable success in connecting professionals and stakeholders, and upholding the image of professional engineers in Hong Kong. I warmly congratulate the Electrical Division for his success and a fruitful 40th Anniversary Dinner.

KM LEUNG

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大續
精發
深展
利創
民繁
生榮

TH TAI

The excellent work done by the division committee under the visionary leadership of each chairman clearly warrants this testimonial 40th anniversary dinner. Facing challenges with strength and confidence, earning recognition of success in organised events through each committee members' altruistic spirit, you all have made our profession proud and inspirational !

Joseph CM LEUNG

I wish to heartily congratulate Electrical Division on its 40th anniversary. With great team work and its broad range of learned society activities, Electrical Division has made important contributions to electrical engineering profession and its members. I wish Electrical Division continued growth and every success in the future.

PN IP

Acknowledgements

The HKIE Electrical Division would like to express our heartfelt appreciation to the companies and organizations advertising in this 40th Anniversary Special Publication.

Company Name	Page
ABB (Hong Kong) Limited	60
Arup	61
C & K Instrument (HK) Limited	59
CLP Power Hong Kong Limited	72
GDEPRI Power Control Systems & Equipment (HK) Limited	59
J. Roger Preston Limited	62
Keystone Electric Wire & Cable Company Limited	63
Lik Kai Engineering Company Limited	64
Mitsubishi Electric (Hong Kong) Limited	65
Schneider Electric (Hong Kong) Limited	2 & 3
S.G.H. Electric Wire & Cable Company Limited	66
Siemens Limited	67
Schweitzer Engineering Laboratories (Shanghai) Company Limited	70 & 71
The Hongkong Electric Company Limited	68
WSP (Asia) Limited	69

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Image

1. Tin Shui Wai Hospital
2. Kai Tak District Cooling System, Hong Kong
3. Commercial and Hotel Development at Tung Chung Town Lot 11
4. Icone Tower, Manila
5. Changsha International Finance Square
6. Mixed Development at Wangfujing, Beijing
7. The Emerald Resort, Philippines

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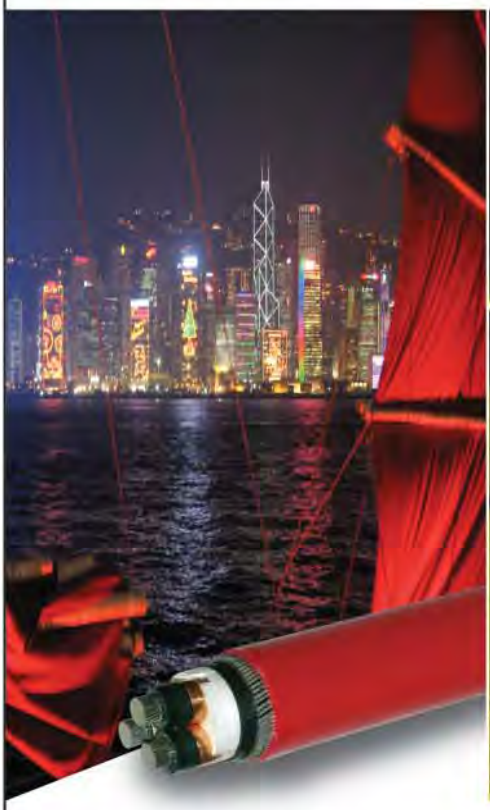

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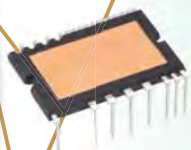

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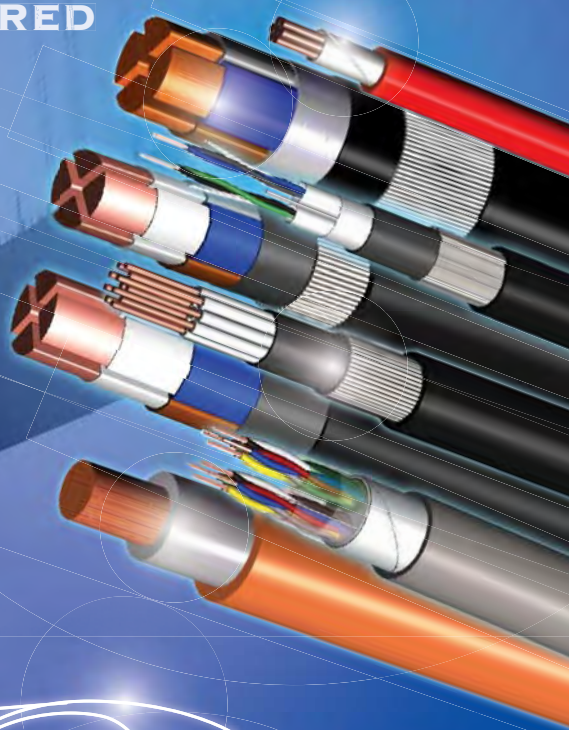

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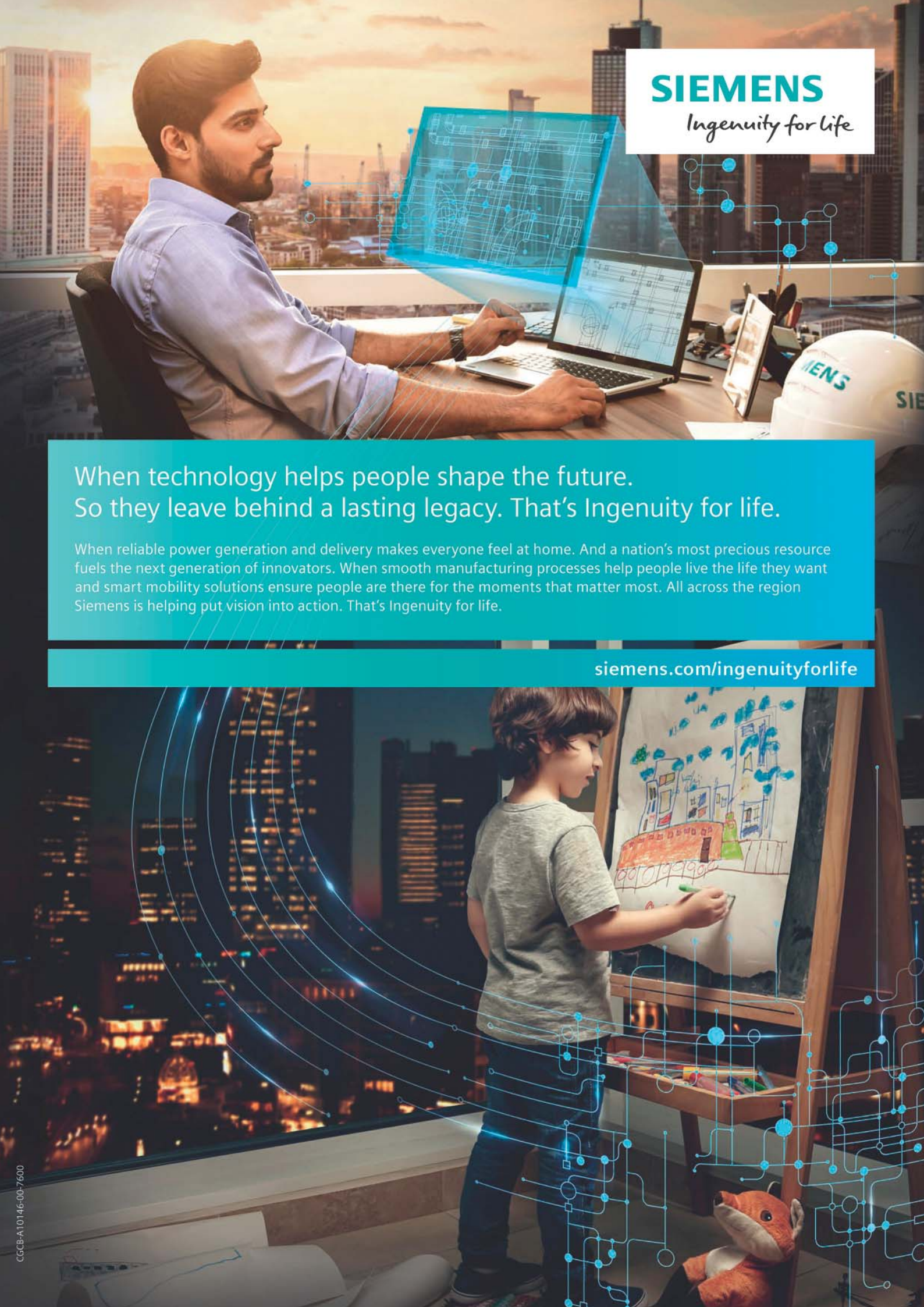
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Eliminate Cybersecurity Threats With SDN

Today's power system engineers need the convenience of Ethernet combined with low latency and fast healing to support mission-critical substation applications. The SEL-2740S Software-Defined Network Switch and SEL-5056 Software-Defined Network Flow Controller provide an innovative solution that employs software-defined networking (SDN) to enhance the dependability, performance, configuration, and management of proactive OT and dynamic IT networks.

- With failover times of less than 100 microseconds, ensure the performance of mission-critical applications under all conditions.
- Simplify the design, testing, and implementation of critical power utility and industrial OT networks.
- Strengthen cybersecurity through deny-by-default network access control.
- Seamlessly integrate with existing network infrastructure through OpenFlow® 1.3 standard support.

To learn more, visit **selinc.com/products/2740S**.

Designing the Future of Substation Cybersecurity

True cybersecurity requires a combination of people, processes, and technology. At SEL, our defense-in-depth philosophy and commitment to building security-aware cultures lead to the most secure and compliant solutions. Backed with years of experience, our Engineering Services team will:

- Assess power system infrastructure to document and resolve risks and gaps in regulatory compliance.
- Identify and analyze cyber threats to minimize their impact on substation operations.
- Review substation cybersecurity operations to provide sensible security solutions.
- Design and implement solutions to enhance and protect mission-critical power systems.

Take the first step to substation security and compliance—visit **selinc.com/solutions/security-for-critical-infrastructure**.

Traveling-Wave Protection and Fault Location

As the first traveling-wave microprocessor-based relay, the SEL-T400L Time-Domain Line Protection trips four times faster than present-day relays and with unmatched selectivity and security. Through the combination of traveling-wave and incremental quantity protection technologies, faults are cleared faster and you get improved safety, better power system stability, and preserved equipment life. And with just a handful of settings, the SEL-T400L is easy to learn, easy to set, easy to apply.

This is transmission line protection, redefined.

To learn more, visit **selinc.com/products/T400L**.

SEL-5601-2 SYNCHROWAVE® Event Software

SYNCHROWAVE Event helps engineers diagnose a protective relay's behavior during a power system fault. It is a powerful yet easy-to-use solution for displaying and analyzing SEL relay event reports and COMTRADE files.

- Diagnose relay behavior during a power system fault.
- Time-align event reports from multiple relays for comparison and analysis.
- Create custom calculations, and plot the results for immediate analysis feedback.
- Gain insight into relay protection performance with advanced mho, Alpha Plane, and Bewley diagrams.

To learn more, visit **selinc.com/products/5601-2**.

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