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76th Issue

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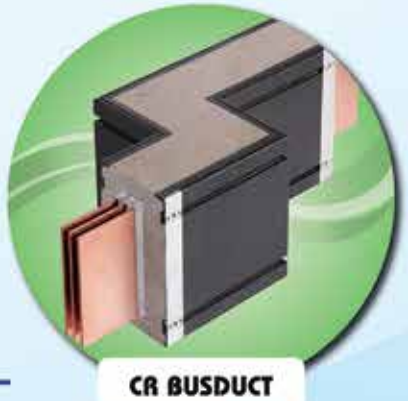
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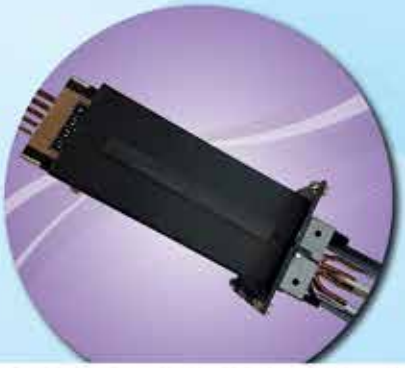
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From The Editor's Desk



TEEAM's bi-annual Dinner was successfully held on 29th September 2018 at the One World Hotel. We thanked the new Minister of MESTECC, The Honourable (YB) Yeo Bee Yin, for gracing our TEEAM's 66th Anniversary Dinner. YB's presence had certainly enhanced our event and YB's speech was well received by all who attended the Dinner.

The construction industry is impacted by local and external factors again and we do hope all our members will continue to negotiate the challenges safely.

The Government's initiative in Renewable Energy (RE) and Energy Efficiency (EE) are always welcomed by the industry. We look forward to the Energy Efficiency and Conservation Act (EECA) which is expected to be gazetted by the end of 2019.

Effective 1st January 2019, the new Net Energy Metering (NEM) scheme will be improved from the net billing concept to the pure net energy metering scheme. This will help improve the return of investment of Solar PV under the NEM scheme.

We look forward to new opportunities in our sector and hope everyone can benefit from the initiatives provided by the new Government.

Regards,

Ir Chew Shee Fuee KMN
Editor
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TEEAM 66th Anniversary Dinner 2018

Record-breaking TEEAM's 66th Anniversary Grand Dinner comprising 118 tables, was held on 29th September 2018, at the One World Hotel in Petaling Jaya. It was a grand celebration Dinner with very good turnouts from the Government sector, NGOs, Embassies, Trade Bodies, Bankers, Press, Overseas Guests from KECA Korea, local business enterprises and supportive TEEAM members.

The Honourable (YB), Yeo Bee Yin, Minister of Energy, Science, Technology, Environment and Climate Change (MESTECC), Malaysia, was the Guest of Honour. The Dinner theme was "Let's Evolve". The Opening Gambit was an impressive 4-piece musical instruments performed by the World Harmonica Champion, Fresco Harmonica Quartet. Guests and members were entertained by singer Dewi Liana with powerful songs that touched the heart. The highlight was the amazing portrait drawing of the MESTEC Minister by Pinky. There was also very entertaining quick costume changes and a magic show by Vivas Magic.

The Dinner also witnessed the presentation of TEEAM's Best Contractor Awards 2018. Cable Line Electrical & Engineering won the Infrastructure Category; Dexon Electrical Engineering won the Residential Category; Sunway Engineering won the Commercial Category; and Bond M&E won the Industrial Category and was the Overall Winner, while Hasilwan, SJEE Engineering and Zofar Mechanical & Electrical, received Merit Awards.

The Grand Dinner was a huge success due to the generous sponsorship and support from TEEAM members and non-members as well. A special session was held to thank the generous sponsors with Tokens of Appreciation.

YB Yeo Bee Yin, in her Keynote Address, highlighted that the Government has plans to reform the electricity supply industry to create more opportunities for small and medium players so that the industry is competitive and efficient. The Minister further announced that the Government planned to increase the Renewable Energy generation mix from 2% to 25% by 2025, if the technology allows. The Energy Efficiency Action Plan is also being reviewed to include new initiatives to spur the E&E industry. The Energy Efficiency & Conservation Act (EECA) is currently being drafted and it is expected to be gazetted by the end of 2019. Plans are also at hand to retrofit Government buildings to reduce energy usage and save money.

The Minister stressed that Malaysia is facing a lot of competition from neighbouring countries, and hence the Malaysian Electrical & Electronics (E&E) industry needs to evolve, as the Dinner theme had highlighted, to be more innovative and value-added to always stay competitive. The Government is consolidating and mapping the Research & Development Funds to benefit the industry. YB Yeo also called on the private sector to trust the new Government and start to invest in the domestic front to help rebuild the economy.

TEEAM President, Ir Yong Ah Huat, in his Speech, highlighted that E&E is an important sector that contributes significantly to the Malaysian Gross Domestic Product (GDP) and creates hundreds of thousands of jobs for Malaysians. TEEAM hoped to participate actively in Government Think-Tank groups and the drafting of national policies under MESTECC. TEEAM will be able to assist the Government in providing information related to the E&E industry, right from the grass-roots level. With a better understanding of the E&E industry from Stakeholders, the Government can introduce business-friendly policies that will help the E&E industry. It will be a win-win situation for the businesses, local workforce and also the Government.

TEEAM is also running a "Buy Made in Malaysia" Campaign for members. TEEAM will be promoting this Campaign to the various



Guest of Honour *– MESTECC Minister, YB Yeo Bee Yin graced the dinner.*



TEEAM President *– Ir Yong Ah Huat delivered his speech during the dinner.*



Dinner Organising Chairman *– Mr Siew Choon Thye thanked all sponsors, members and guests for the continued support extended to TEEAM.*



All smiles *– TEEAM Council Members posing with the MESTECC Minister, YB Yeo Bee Yin.*

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..... Continue TEEAM 66th Anniversary Dinner 2018

Government agencies and the private sector too, in the hope that this will assist the local manufacturers to sustain in trying times, and also to secure local workforce jobs in the manufacturing sector. Another reason for running this Campaign is to reduce dependency on imported goods, increase local R&D efforts and to help reduce capital outflow. This pro-active initiative from TEEAM will be a positive contributor to driving the national economy forward.

On the energy and environmental fronts, TEEAM hoped that MESTECC can work closely with the Transport Ministry to implement the use of electric bikes and electric vehicles on the road. A Roadmap must be put in place so that consumers can use electric bikes and electric cars. It is hoped that the new Government will bring in more incentives to drive the E&E industry to the next level of growth.

He concluded his Speech with heartfelt congratulations to the Dinner Organising Committee and the Secretariat Staffs for their excellent effort in preparing for the grand celebration Dinner, which saw such a record turnout. Special thanks were also extended to all the Dinner Sponsors for their many years of continuous support to TEEAM.

The Dinner Organising Chairman, Mr Siew Choon Thye, who is also the TEEAM Deputy President, thanked his Organising Committee for their great effort in organising the Grand Dinner. He was delighted to see a great turnout and a record-breaking attendance of 1,180 invited guests and members. All these would not have been possible without the generosity of all our highly esteemed Sponsors. He expressed his heartfelt thanks to the exclusive Diamond Sponsor, Philips Lighting Commercial Malaysia; the Platinum Sponsors, ADSALE Exhibition and EITA Resources Berhad, and all other generous Sponsors, for their tremendous support. Special thanks were also recorded to Standard Chartered Bank for their Roadshow presence.

The much-awaited excitement for the Night was the lucky draws with twenty Khind Table Fans given away to the lucky winners. The Grand lucky draws capped off the evening with the presenting of attractive prizes, namely, the Sharp 60" Full HD LED TV, Samsung Galaxy Note 8, Samsung Galaxy J7 Pro, Viva V9 and Huawei Tab 7.0. TEEAM once again records its heartfelt appreciation and thanks to all loyal Sponsors, Guests, Members and the Press for their strong support and highly encouraging presence at TEEAM's 66th Anniversary Dinner 2018.



Amazing *– A lovely portrait was presented to YB Yeo Bee Yin as a Token of Appreciation.*



A good photo for remembrance *– (from left) Datuk Ir Ahmad Fauzi Hasan (Chairman of Energy Commission), Ir Yong Ah Huat (TEEAM President), YB Yeo Bee Yin (MESTECC Minister), Dato' Mohsen Hasbollah (PERKEM President), Dato' Andy Kwan (MACRA President) and Mr Jeffrey Lim (BASAM President).*



The lucky ones *– Congratulations to all the lucky draw winners.*



Happy occasion *– A grand dinner celebration with full house of 1,180 members and guests.*

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Nominal Size	Dimensions (mm)					Weights (g/m)			
	A		B	C		Class 1, 2, and 3		Class 4	
	Min.	Max.		Min.	Max.	Min.	Max.	Min.	Max.
16	15.7	16.0	1.4 ± 0.10	11.5	13.5	452	531	483	594
20	19.7	20.0	1.6 ± 0.15	13.0	15.0	643	783	682	862
25	24.6	25.0	1.6 ± 0.15	16.0	18.0	811	995	860	1095
32	31.6	32.0	1.6 ± 0.15	18.0	20.0	1069	1301	1133	1432

Preferred length of conduit 4.0 m. Minimum 3.0 m. Maximum 4.0 m.

BS31: 1940 Screwed Conduit - Heavy gauge (Class 3 Galvanized Iron)

			Thickness				Calculated Weight Black and without coupling		
Trade Size	Outside Diameter		Nominal		Minimum		Per 100ft		Per 100m
inch	inch	mm	inch	mm	inch	mm	lbs	kg	kg
¾	¾	19.0	0.064	1.6	0.060	1.52	47	21.3	69.9
1	1	25.4	0.064	1.6	0.060	1.52	64	29.0	95.1
1¼	1¼	31.8	0.064	1.6	0.060	1.52	81	36.7	120.4
1½	1½	38.1	0.072	1.8	0.068	1.73	110	49.9	163.7
2	2	50.8	0.080	2.0	0.076	1.93	164	74.4	244.1

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..... Continue TEEAM 66th Anniversary Dinner 2018



Remarkable achievement *– The TEEAM Best Contractor Awards 2018 presented to the winners for their outstanding electrical construction project performances.*



High appreciation *– Presentation of appreciation plaques to the generous sponsors for making the dinner a success.*

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CEPSI Malaysia 2018

The 2018 Conference of Electric Power Supply Industry (CEPSI) was successfully organised from 17th to 22nd September 2018. It was the most prominent event established under the fraternity of the Association of the Electricity Supply of East Asia and the Western Pacific (AESIEAP) since 1976. It was back again in Kuala Lumpur after 22 years and the 2018 edition was hosted by Tenaga Nasional Berhad (TNB), with the theme of "Reimagining Utility of the Future". Topics that addressed the theme included Megatrends, Sustainability, Energy Trilemma, Digitalisation and a Smarter Future.

The Conference provided an excellent platform for power companies, utility leaders, professionals and experts from all over the world to exchange technology and expertise and fostering co-operation to further develop the energy industry. More than 500 Technical Papers were presented by high-profile speakers and international experts who covered eight major streams, namely, Sustainability & Green Energy, Generation & Future Alternatives, Transmission & Future Grid, Distribution & Advanced Network, Smart Grid & New Technology, ICT & Innovation, Retail & Customer Service, and Business Transformation. There was also opportunity for the industry players to showcase and exhibit the latest technology, relevant products and services in conjunction with CEPSI 2018. TEEAM also took part as an exhibitor to promote the Association's activities. The Conference and Exhibition received more than 2,000 Delegates and 250 Exhibitors from 30 countries over the three days event.



Official Launch *– Ribbon-cutting by the Honourable Minister, Yeo Bee Yin, of the Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC).*



Fellowship *– TEEAM and UBM Officials sharing a light moment.*



Guest of Honour *– A special session with The Right Honourable (YAB) Prime Minister, Tun Dr Mahathir Mohamad at the 22nd edition of CEPSI 2018.*

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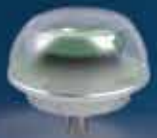
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ASEAN Electro-Technical Symposium & Exhibition 2018

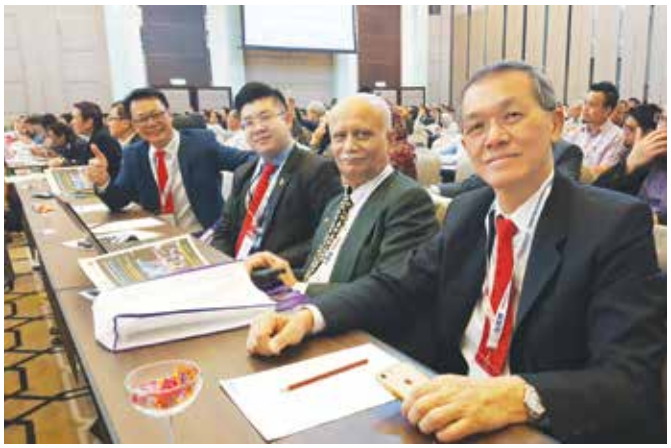
The Institution of Engineers, Malaysia (IEM), in collaboration with the Department of Standards Malaysia (Standards Malaysia) and the Energy Commission (Suruhanjaya Tenaga, ST), successfully organised a two-day Symposium & Exhibition on 4th and 5th December 2018 at the Nexus Connexion Conference & Event Centre, in Kuala Lumpur. It was the second edition since 2016 and TEEAM together with other partnering organisations supported the grand event. An Exhibition was held alongside the Symposium, with 39 booths from local and overseas exhibitors, who showcased their related products and services.

This significant Symposium and Exhibition drew strong participation from domestic and ASEAN countries. They comprised Engineering-Competent Professionals, Consultants, Government Officials, Policy Makers, Standards Organisations, Contractors, Manufacturers, Suppliers and Engineering Students from learning institutions. The Opening of the overwhelmingly-attended Symposium was officiated by Datuk Fadilah Baharin, Director General of Standards Malaysia.

The theme of the Symposium was "Standards Drive Global Value Chains" and was aimed to establish the importance of compliance to relevant electro-technical standards among the ASEAN countries. Informative papers were presented in the Symposium by local and ASEAN experts.

The President of the International Electro-Technical Commission (IEC), Mr James M Shannon, was among the VVIP guests. He had a Dialogue Session with members of the Malaysia Electro-Technical National Committee and the Stakeholders during the symposium. He shared the standardisation development works of IEC and discussed the importance of standards in enhancing the quality of life and the safety of human beings.

TEEAM wishes to congratulate IEM, Standards Malaysia and the Energy Commission for this tremendously successful event which drew a fantastic crowd of some 600 participants. Congratulations and well done!



Strong presence from TEEAM *– (from right) Ir Yong Ah Huat (President), Mr Suresh Kumar Gorasia (International Affairs Chairman & Past President), Mr Lim Sai Seong (Assistant Honorary Secretary) and Mr Siew Choon Thye (Deputy President).*



TEEAM Officials *– (from left) Dato' Ir Lee Peng Joo (Past President), Ir Rocky Wong (Honorary Fellow & Technical Advisor), Ir Yong Ah Huat (President), Dato' Ir Donald Lim (Honorary Fellow & Past President) and Mr Chong Yoon Koon (Council Member).*



For the album *– Group posing after the IEC President Dialogue Session with the National Committees and Stakeholders.*

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..... Continue ASEAN Electro-Technical Symposium & Exhibition 2018



Catching-up *– A pose for the album.*



Great support *– Delegation from PKPPE, Perak.*



Networking Luncheon *– Officials of TEEAM, MyCIE, IEM-EETD and Standards Malaysia, posing for the album.*



Thank you *– TEEAM President, Ir Yong Ah Huat (left), receiving a Certificate from IEM-EETD Committee Member and Symposium Organising Chairman, Mr Alex Looi, in appreciation of TEEAM being one of the supporting partners of the Symposium.*



Keynote Address *– IEC President, Mr James M Shannon addressing the participants on "The Role of Standards in the Global Value Chain".*



Full house *– A cross-section of participants.*



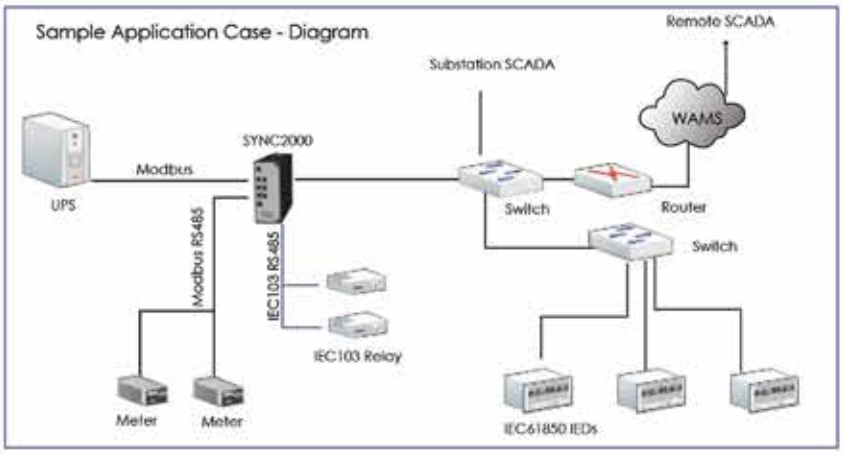
VVIP tour *- (from left) Mr Alex Looi (IEM-EETD Committee Member & Symposium Organising Chairman), Mr Lim Sai Seong (TEEAM Assistant Honorary Secretary), Mr Siew Choon Thye (TEEAM Deputy President), Mr Suresh Kumar Gorasia (TEEAM International Affairs Chairman & Past President), Datuk Fadilah Baharin (Director General of Standards Malaysia), Ir Yong Ah Huat (TEEAM President), Mr James M Shannon (IEC President), Ir David Lai (IEM President), Ir Rocky Wong (TEEAM Honorary Fellow & Technical Advisor) and Mr Dennis Chew (Regional Director of IEC Asia-Pacific Regional Centre).*

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TEEAM Members @ The Symposium & Exhibition



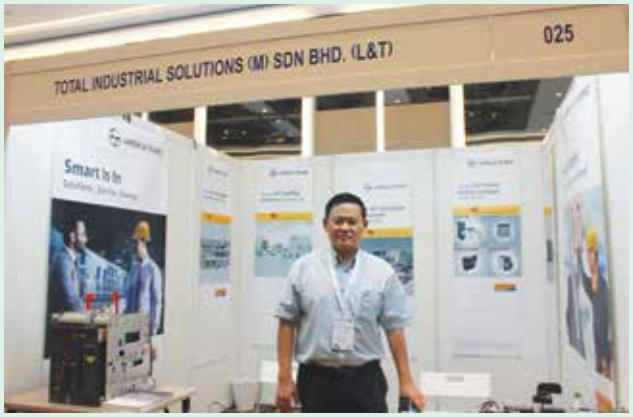














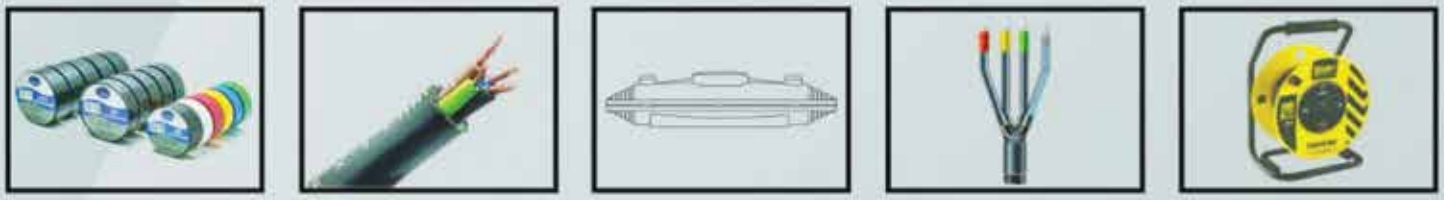
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AFEEC-FAPECA Conference & Meeting in Manila

The 2018 Conference and Meeting of the ASEAN Federation of Electrical Engineering Contractors (AFEEC) and the Federation of Asian Pacific Electrical Contractors Associations (FAPECA) was held from 19th to 22nd September 2018 at the SMX Convention Centre in Manila, Pasay City, Philippines. The Grand event was hosted by The Society of Philippine Electro-Technical Constructors and Suppliers (SPECS) Inc. It was held in conjunction with the inaugural Electrical, Energy & Power (EE & P) Philippines 2018 Exhibition.

There was overwhelming participation from members of AFEEC and FAPECA, namely, the National Associations including the Association of Indonesia Electrical and Mechanical Contractors (AKLI), Korea Electrical Contractors Association (KECA), Taiwan Electrical Contractors Association (TECA), Hong Kong Electrical Contractors Association (HKECA), Thai Electrical & Mechanical Contractors Association (TEMCA), Singapore Electrical Contractors & Licensed Electrical Workers Association (SECA), TEEAM and SPECS.

Conference on "Energy Storage Solutions"

The energy sector is crucial to all countries' sustainable development. Energy storage solution is important to ensure power supply security, reliability and efficiency. As such, a timely Conference on the all-important "Energy Storage Solutions" was held on 20th September 2018. The Opening Ceremony witnessed a grand entrance of colours and professional marches. Each member country marched in with its national flag and logo banner. It was indeed a very vibrant and highly colourful atmosphere.

The Conference discussed and shared energy storage technology and solution, and energy saving of the respective member countries of AFEEC and FAPECA. Very interesting and informative Papers were presented during the Conference. The topics were:

* Nano-Materials for Advanced Hybrid Super-Capacitor Electrical Storage Systems and Applications, by Ir Dr Ng Kok Chiang, TEEAM Malaysia
* Energy Solutions for Singapore 2018, by Mr Edward Kway, SECA Singapore
* Battery Energy Storage Opportunities in the Philippines, by Mr Francisco Gonzalez, Jr, SPECS Philippines
* Exploring Energy Solutions, by Ir Dr F C Chan, HKECA Hong Kong
* Design of DC Micro-Grid Using ESS for Small Industry Complex, by Professor Dr Moon Chae-Joo, Mokpo National University, Korea
* Energy Storage System in Korea, by Professor Dr Woo Tae-Hee, Yon Sei University, Korea
* Energy Saving Approach in Thai Small and Medium Enterprises, by Mr Chanapatt Pattaramaetakul, TEMCA Thailand
* The Digital Age of Taiwan Power Company, by Mr Tsai Mao-Chung, TECA Taiwan

SPECS 50th Anniversary Dinner 2018

A Welcome Dinner was hosted by SPECS for the foreign Delegates and it coincided with SPECS' 50th Anniversary Dinner. It was a Grand celebration and Delegates had the opportunity to network with and to build business contacts with members of SPECS. The Dinner also witnessed the presentation of the AFEEC Best Contractor Awards for



Meeting in progress *– The 56th AFEEC Council Meeting which was held on 21st September 2018.*



Ir Dr Ng Kok Chiang *– Presented TEEAM's Paper on "Nano-materials for Advance Hybrid Super-capacitor Electrical Storage Systems and Applications".*



For the album *– Delegates posing after the 32nd FAPECA Board Meeting.*

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..... Continue AFEEC-FAPECA Conference & Meeting in Manila



Arrival of TEEAM's Delegates *– Warm welcome from the Host, SPECS.*



Happy occasion *– TEEAM's Delegates posing after the Welcome Dinner.*



All smiles *– VIPs at the Opening Ceremony of AFEEC-FAPECA Conference 2018 and EE & P 2018 Exhibition.*



Entrance of Colours *– All delegates are ushered into the hall with each country's national flag and logo banner.*



TEEAM's Delegation *– (from left) Ms Winnie Khong (Executive Secretary, Mr Subramaniam Karuppan (Honorary Secretary), Ir Chang Yew Cheong (Vice President – Construction & Services), Mr Siew Choon Thye (Deputy President), Mr Stan Lim (Vice President – Trading), Mr Simon Leong (Vice President – Manufacturing) and Ir Chew Shee Fuee (Out-going AFEEC President).*



VIPS at the Conference *– (from left) Mr Francisco B Gonzalez Jr (SPECS President), Ir Chew Shee Fuee (Out-going AFEEC President), Mr Soewarto Wirjo Martono (AKLI President), Mr John Tan (SECA President), Mr Siew Choon Thye (TEEAM Deputy President) and Mr Somchai Jadsadanapawong (TEMCA President).*

2018 to members of TEEAM and AKLI. The other AFEEC member countries did not participate. The recipients were:

TEEAM-Malaysia Recipients -

- Bond M & E Sdn Bhd – Winner of the Industrial Category
- Cable Line Electrical & Engineering Sdn Bhd – Winner of the Infrastructure Category
- Dexon Electrical Engineering Sdn Bhd – Winner of the Residential Category
- Sunway Engineering Sdn Bhd – Winner of the Commercial Category

AKLI-Indonesia Recipient -

- PT Jaya Teknik – Winner of the Industrial, Commercial & Residential Category

AFEEC-FAPECA Board Meetings

The 56th AFEEC Council Meeting and 32nd FAPECA Executive Board Meeting were convened smoothly on the afternoon of 21st September 2018, at the SMX Convention Centre. It was also an excellent avenue for networking and exploring business opportunities. The Meeting witnessed the official hand-over of the AFEEC Presidency from TEEAM Malaysia to SPECS Philippines. Engr Arthur N Escalante, Former President of SPECS, now helms the AFEEC Presidency for the term 2018-2020. The FAPECA Presidency is helmed by Mr Ryu Jae-Sun of KECA Korea for the term 2017-2019.

This annual meeting is important to bind members in achieving the common objectives - one of which is to promote and recommend rules and standards that will govern the regional operations of the electrical engineering contracting industry, in order to ensure and foster fair and healthy competition among the members, in an atmosphere of win-win constructive co-operation and mutual understanding.

Friendly Golf Game

As for the golf enthusiasts, a friendly Golf game was arranged at the Manila Southwoods Golf & Country Club. The Golf session aimed to promote sporting spirit and further strengthening of business co-operation and friendship ties amongst AFEEC-FAPECA members.

Farewell Dinner

A casual Farewell Dinner was hosted by SPECS at the Vikings Luxury Buffet Restaurant to bid farewell to the foreign Delegates. It was a fun-filled night with entertaining Karaoke singing and dancing amongst the Delegates. There was a very elaborated buffet line and drinks for the Delegates to enjoy. It was indeed a joyful night for all.

Thank You

The Delegation from TEEAM truly enjoyed SPECS' warm hospitality. TEEAM thanked the great host, SPECS, for putting up such tremendous hard work and great effort in organising such a fantastic Grand event. Well done SPECS! Congratulations!

KECA is slated to host the 2019 AFEEC-FAPECA Conference and Meeting in Seoul, Korea in the month of October/November 2019.

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..... Continue AFEEC-FAPECA Conference & Meeting in Manila



Official Hand-Over *– (right) Ir Chew Shee Fuee (Out-going AFEEC President) handing over the AFEEC Presidency to Engr Arthur N Escalante of SPECS. Engr Arthur helms the AFEEC Presidency for the term 2018-2010.*



Welcome Dinner *– (from left) Mr Edward Kway (SECA Secretary General), Mr Emil Yu (HKECA President), Ir Chew Shee Fuee (Out-going AFEEC President), Mr Ryu Jae-Sun (KECA President), Mr Simon Cho (KECA Overseas Team Manager), Mr Siew Choon Thye (TEEAM Deputy President) and Mr Francisco B Gonzalez Jr (SPECS President)*



At the Farewell Dinner *– TEEAM's Delegates belting two patriotic songs, namely "Setia" and "Sejahtera Malaysia".*



Fruitful meeting *– Delegates posing after the 56th AFEEC Council Meeting.*



EE & P 2018 Exhibition *– Delegation posing at TEEAM's Booth.*



Warm Welcome *– Host's Working Staffs with TEEAM's Delegates.*



TEEAM's Delegates *– Strong contingent from TEEAM, Malaysia.*

TEEAM Members Receiving the AFEEC Best Contractor Awards 2018



Bond M&E *– Winner of Industrial Category*



Cable Line *– Winner of Infrastructure Category*



Dexon *– Winner of Residential Category*



Sunway *– Winner of Commercial Category*

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Seminar on ECO-Labelling and MyHIJAU Programme

The TEEAM Manufacturing Committee successfully organised a half day Seminar on ECO-Labelling and MyHIJAU Programme on 22nd November 2018 at TEEAM's Seminar Hall. The Session attracted some 39 participants. The Seminar aimed to educate and create awareness among the consumers, businesses and manufacturers on environmental preferable goods and services; and to increase the marketability of products to environment-conscious consumers.

The first invited Speaker was Ir Syed Fadzil Syed Mohamed, a Senior Consultant from SIRIM QAS International Sdn Bhd. Ir Syed Fadzli covered the topic on SIRIM ECO-Labelling Certification Scheme. Participants were briefed on ECO-Labelling Certification requirements and products' specification and how to obtain and comply with testing/authorities' requirements.

After a short break, the Seminar continued with the second Speaker, Mr Abd Malik Atan, from Green Catalyst of Malaysian Green Technology Corporation (GreenTech Malaysia). Mr Abd Malik shared the MyHIJAU Programme, a direction of Government Green Procurement (GGP). MyHIJAU Mark is Malaysia's official green recognition endorsed by the Government, bringing together certified green products and services that meet local and international environmental standards, under one single mark.



Smiles *– TEEAM Council Members posing with the Speakers during the networking lunch.*

It was a very beneficial and fruitful Seminar for all present. At the end of the enlightening Session, participants were served with a sumptuous vegetarian lunch. An appreciation was recorded to Furutec Electrical Sdn Bhd for sponsoring the "Green" lunch!



Mr Abd Malik Atan *– Speaker from GreenTech Malaysia who highlighted the benefits of MyHIJAU Mark Registration.*



Ir Syed Fadzil Syed Mohamed *– Speaker from SIRIM QAS who elaborated on the ECO-Labelling Certification Process.*



Interactive *– Participants during tea break.*





Souvenir Presenting *– Mr Simon Leong (TEEAM Vice President & Manufacturing Group Chairman) presented a Token of Appreciation to the Speakers after the Talk.*



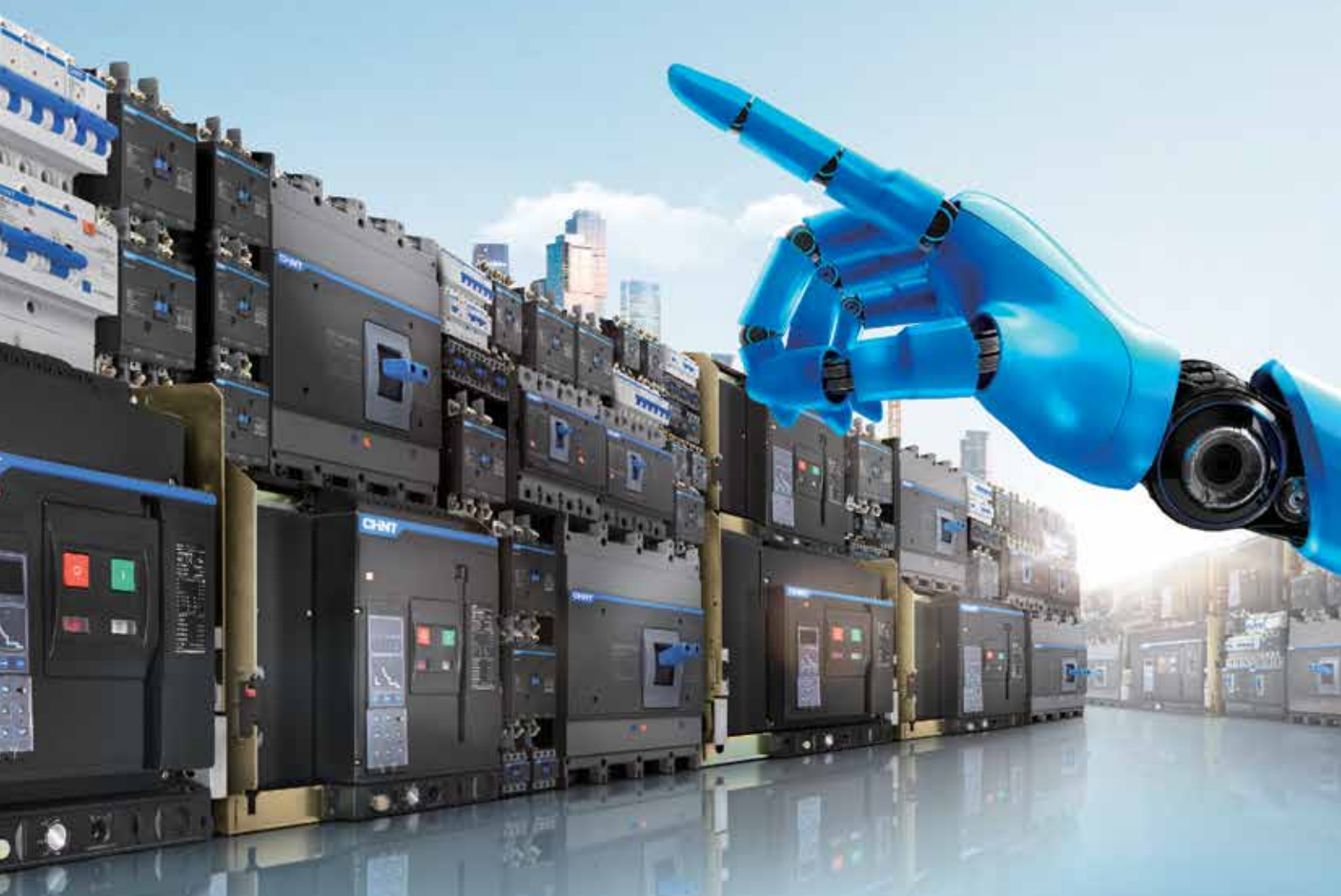
Good response *– A group photo for the album.*



For the album *– Good networking.*

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Self-Test RCCB Awareness Roadshow

On 10th November 2018, TEEAM and the Perak Electrical Chargemen & Wiremen Competence Association (Persatuan Kekompetenan Penjaga Jentera & Pendawai Elektrik Perak, PKPPE) made great effort in organising a Self-Test RCCB (Residual Current Circuit Breaker) Safety Roadshow at the Marina Island Jetty Complex in Lumut, Perak. The noble objective was to improve public awareness on the importance of regularly performing the Self-Test RCCB.

The event was conducted by having a Demo Panel Unit to let the public have some self-test hands-on experience. In this way, they will understand better the importance and function of the safety-breaker, RCCB. Mr Muhammad Hasanol Mustafa of the Energy Commission (Suruhanjaya Tenaga, ST) Perak State was present to support and witness the event. An appreciation was recorded to Benepark Sdn Bhd for providing the venue space and also to Rockbund Fishing Chalet Sdn Bhd for the Roadshow facilities and arrangement. It was indeed a meaningful activity for the local community in Lumut.



Great support from ST *– (2nd from right) Mr Choong Soon Yean (PKPPE President) presenting a Souvenir to the invited guest, Mr Muhammad Hasanol Mustafa (Assistant Director of ST Perak) for his presence.*



Demo *– Mr Ooi Eng Guan (TEEAM Test RCCB Roadshow Manager) explained and showed the correct RCCB testing procedure to the public.*



Tireless efforts *– PKPPE Official giving an explanation on safety to the public at the Jetty waiting point.*



Safety education *– A group of students and teachers being briefed on home electrical safety.*



Awesome *– A group photo with the collaborating partners.*

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Workshop on Safety Considerations for Live Measurements

Fluke Electronics (M) Sdn Bhd, in collaboration with TEEAM, jointly conducted a half-day Workshop on Safety Considerations for Live Measurements, on 6th December 2018 at TEEAM's Seminar Hall. The Keynote Speaker was Mr Liaw Wai Ping, a Channel Manager from Fluke Malaysia. Fluke specialises in the manufacturing of Electrical Testing and Calibration Tools.

During the Workshop, participants were briefed on the selections of electrical measurement tools to ensure safety in their working environment, which is classified by IEC Standards. The new Fluke FieldSense Electrical Tester enables simultaneous voltage and current measurements without metallic contacts. Troubleshooting electrical systems has traditionally required gaining access to metallic contact points so the test leads can make contact. This new technology with enhanced safety was introduced to the participants. Some twenty participants attended and benefited from the Workshop.



Speaker *– Mr Liaw Wei Ping shared on how to perform safer electrical works with the latest technology.*



Engrossed *– Workshop in progress.*



Networking *– Participants during tea break.*



Interesting *– Participants were attracted to the hands-on display of Fluke products.*

Lucky Draw Session during the Fluke Safety Workshop











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IGEM 2018

IGEM 2018, the 9th International Greentech & Eco Products Exhibition and Conference Malaysia, was held from 17th to 20th October 2018 at the Kuala Lumpur Convention Centre. The event was organised by the Ministry of Energy, Science, Technology, Environment & Climate Change (MESTECC) to create a platform for solution providers and green energy businesses to tap into the fast expanding ASEAN market, by showcasing the latest innovations to Government organisations, policy makers, investors and the mass market. Themed "Green Economy & Industry 4.0," it was aimed to achieve sustainable development goals for various global industries, explore the integration modes between green economy solutions and its application to the current automation trend which includes; the Internet of Things (IoT), Cyber Security, System Integration, Big Data, Autonomous Robots, etc.

This 4-day event showcased green technology solutions and was represented by 250 exhibitors from 30 countries. Additionally, there was a multi-track congress session sharing best practices with various topics from more than 40 experts.

TEEAM was present at IGEM 2018 and TEEAM's magazine, Suara TEEAM, was one of the Supporting Media. Overall, it was a good platform for green product buyers and sellers to interact, to transact and to forge new partnerships and cross border collaborations.



Official Opening *– The Honourable, Yeo Bee Yin (MESTECC Minister), shared the Government's green energy plan during her speech at the Opening Ceremony.*



All about Solar PV *– TEEAM Member, Gading Kencana, was one of the exhibitors in IGEM 2018.*



Interesting *– Visitors attracted to the Electric Vehicles and Charger.*



Supportive *– TEEAM was present at IGEM 2018.*



A cross-section of IGEM *– An Expo with a strong focus on Green Products and Technologies.*

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Seminar on Smart Energy

A half-day Seminar on Smart Energy was held on 23rd November 2018 at TEEAM's Seminar Hall. Organised by Prismatic Energy Solutions (M) Sdn Bhd in collaboration with TEEAM, this Seminar attracted some 38 participants. The Speakers were Certified Electrical Energy Managers, namely, Mr Saravana Jothi Arumugam, Mr VTR Dharamarajah and Mr Sreeraj Manogran. The distinguished Speakers were from the registered Malaysian Energy Services Company, MAESCO. They have vast experience and knowledge in the field of Energy Management.

During the Seminar, participants were exposed to Energy Efficiency through innovative and reliable methods; taught to reduce the facilities operating cost in its optimum state in order to maximise yield. The Seminar was approved with CIDB CCD points, BEM CPD hours and ST CDP hours. Overall, the topics were very informative and benefited all the participants.



Networking *– (from left) Ir Looi Hip Peu and Mr Ong Ah Cheong, (both are TEEAM Committee Members), Mr How Chee Seng (TEEAM Council Member) and Mr Au Wai Yeen from the Perak Electrical Association (PEA).*



Speaker from Prismatic *– Mr Sreeraj talked on Voltage Sag and Surge Solution.*



Speaker from Saturn Pyro *– Mr Saravana Jothi highlighted on the Energy Monitoring System Applications.*



Seminar in progress *– Information and ideas being shared.*



Speaker from E-Eye *– Mr Dharamarajah presented Case Studies on the Energy Saving Project for a Chiller.*



Fruitful *– A group photo of Speakers and Participants capped off the event.*









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BS 31 CLASS B (SCREWED) / MANUFACTURER'S STANDARD

NOMINAL SIZE	OUTSIDE DIAMETER				WALL THICKNESS				CALCULATED WEIGHT WITH COUPLER			NUMBERS OF THREADS	LENGTH OF THREADS			
	MINIMUM		MAXIMUM		MINIMUM		MAXIMUM						MINIMUM		MAXIMUM	
in	mm	in	mm	in	mm	in	mm	in	kg/m	kg/ft	lb/ft	PER INCH	mm	in	mm	in
¾	18.76	0.7387	19.05	0.7500	1.52	0.060	1.63	0.064	0.713	0.217	0.479	16	12.70	0.5000	14.29	0.5625
1	25.11	0.9887	25.40	1.0000	1.52	0.060	1.63	0.064	0.972	0.296	0.653	16	15.88	0.6250	17.46	0.6875
1¼	31.46	1.2387	31.75	1.2500	1.52	0.060	1.63	0.064	1.240	0.376	0.830	16	17.46	0.6875	19.05	0.7500
1½	37.80	1.4880	38.10	1.5000	1.73	0.068	1.83	0.072	1.680	0.511	1.130	14	19.05	0.7500	20.64	0.8125
2	50.50	1.9880	50.80	2.0000	1.93	0.076	2.03	0.080	2.510	0.765	1.690	14	22.23	0.8750	23.81	0.9375

MS 275 / BS 4568 CLASS 3 (SCREWED) / MANUFACTURER'S STANDARD

NOMINAL SIZE	OUTER DIAMETER		WALL THICKNESS	CALCULATED WEIGHT WITH COUPLER		PITCH	LENGTH OF THREADS	
	MINIMUM	MAXIMUM		MINIMUM	MAXIMUM		MINIMUM	MAXIMUM
mm	mm	mm	mm	kg/m	kg/m	mm	mm	mm
20	19.7	20.0	1.6 ± 0.15	0.643	0.783	1.5	13	15
25	24.6	25.0	1.6 ± 0.15	0.811	0.995	1.5	16	18
32	31.6	32.0	1.6 ± 0.15	1.069	1.301	1.5	18	20

MS IEC 61386-1 / MS 61386-21 Conduit Systems for Cable Management.

NOMINAL SIZE	OUTER DIAMETER		INSIDE DIAMETER	EXTERNAL THREAD LENGTHS
	MINIMUM	MAXIMUM	MINIMUM	MINIMUM
mm	mm	mm	mm	mm
20	19.7	20.0	16.2	14.0
25	24.6	25.0	21.1	17.0

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26th JSC EEE Meeting in Sandakan 2018

The 26th Meeting of the Joint Sectoral Committee for Electrical and Electronics Equipment (JSC EEE) was held from 14th to 16th November 2018 at Four Points By Sheraton Sandakan, Sabah. Malaysia was the host country and the Energy Commission of Malaysia (Suruhanjya Tenaga) made all the flawless arrangements. The 26th JSC EEE Meeting was attended by a total of 51 representatives from Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. There were two representatives from the ASEAN Secretariat and one representative from IEC Asia Pacific Regional Center (APRC). TEEAM was honoured to be invited to the meeting and was represented by Mr Siew Choon Thye (Deputy President).

The Opening of the 26th JSC EEE Meeting was officiated by Mr Feris Frederick, Principal Assistant Director, Standardisation Division, Department of Standards Malaysia (Standards Malaysia), on behalf of Datuk Fadilah Baharin, Director General of Standards Malaysia.

Since its establishment in 2005, JSC EEE has and continues to be a useful platform to promote co-operation on standards and conformity assessment of the sector within the ASEAN region. The Committee is an active Working Group, serving as an avenue for its members to communicate, interact and exchange ideas in achieving the noble goals of the ASEAN Economic Community (AEC). The Committee consists of ASEAN member states' regulatory authorities, who are responsible for accomplishing the ASEAN Mutual Recognition Arrangement for Electrical and Electronic Equipment (ASEAN EEE MRA), which was signed in 2002, and the ASEAN Harmonised Electrical and Electronics Equipment Regulatory Regime (AHEEERR), signed in 2005.

The Meeting was led by Mr Neil Catajay, Division Chief, Bureau of Standards of the Philippines, Department of Trade and Industry, Philippines, who is the Chair of JSC EEE. Mr Sim Choon Siong, Executive Director of Quality and Excellence, Consumer Protection, Weight & Measures, Enterprise Singapore, was the Co-Chair of JSC EEE.

The 26th JSC EEE Meeting was preceded by an Information Exchange Forum which is aimed to complete the development of a harmonised step-by-step and acceptance procedure for Certification schemes in order to support the implementation of the AHEEERR. The outcome was then discussed in greater depth during this 26th JSC EEE Meeting.

The Agenda of the 26th JSC EEE Meeting included updates on the latest developments in the ASEAN integration initiatives, follow-up actions from the previous meeting, and exchange of information on technical regulations to enhance transparency. The meeting also discussed the progress of the implementation of the ASEAN EEE MRA, progress of the implementation of the Agreement on AHEEERR, co-operation with international organisations and dialogue partners, as well as the JSC EEE Action Plan for 2016-2025.

The Delegates and Observers from Brunei Darussalam, Cambodia, Indonesia, Myanmar, Philippines, Singapore, Thailand, Vietnam, and the ASEAN Secretariat as well as the IEC-APRC, expressed their appreciation to the Energy Commission of Malaysia for the warm hospitality extended and the excellent arrangements made for the Meeting. They had a very fruitful meeting and an enjoyable stay in Sandakan, Malaysia. As always, the Meeting was held in the traditional spirit of ASEAN cordiality and solidarity.



VIPs at the Opening *– 26th JSC EEE Meeting was officiated by (centre) Mr Feris Frederick (Principal Assistant Director of Standards Malaysia), on behalf of Datuk Fadilah Baharin, Director General of Standards Malaysia.*



Overwhelming *- 26th JSC EEE Meeting in progress.*



All smiles *– Group photo of the Participants after the conclusion of the 26th JSC EEE Meeting.*

..... Continue on page 49.

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Medium Voltage Cable Accessories Technologies and Causes of Failure

This article is written by Mr Selvakumar, Technical Leader from 3M Asia Pacific (Singapore) Pte Ltd

Cable accessories form the weakest link in any power network and yet these are not widely understood. There are four technologies used in medium voltage cable accessories, namely, Taping, Push-on, Heat Shrink and Cold Shrink.

The key functions of medium voltage cable accessories are to provide stress control, insulation and environmental sealing. Terminations also need to provide tracking protection. Although the functions of the four technologies serve the same purpose, they are actually very different. Each technology has its advantages and disadvantages.

Cold Shrink and Push-on products are typically made from either the Ethylene Propylene Diene Monomer (EPDM) or silicone rubber, while most Heat Shrink products are made from Ethylene Vinyl Acetate (EVA). All three of these materials are cross-linkable, which is what allows them to be stretched and then shrunk onto the cable.

Heat Shrink products have a multi-piece design. The insulation, stress control and conductive layers are produced as separate tubes and therefore factory test is not possible. Each tube needs to be installed in the field using torch, by the installers, in the right sequence and dimensions. The right amount of heat must be applied to achieve the required thickness and length, without leaving any air-voids or else it will increase the risk of failure. The installer must be experienced and skillful to complete a proper and consistent installation. Also, there is no interfacial pressure and therefore requiring adhesives for sealing. Heat Shrink products do not expand and contract with the cable during large load swings. Since the tubes are expanded, they will accommodate a wide range of cable sizes.

Cold Shrink products and Push-on products have some similarities. Both have one-piece design where the insulation, stress control layers and conductive layers are moulded or loaded together. This reduces the number of steps required to complete a joint or termination and therefore there is lesser chance of installers' error. Factory testing is possible for both technologies.

Push-on products will require a larger inventory to cover a range of cable sizes as they can only cover a small range of cable sizes now. Push-on products require specialised tools for larger cable sizes and voltages in order to push the splice or termination onto the cable. Push-on products also provide less initial interface pressure than Cold Shrink products and tend to lose much of their interface pressure as they go through load cycles. Since the initial interface pressure of push on splices is lower, they must have a much longer interface to provide the same electrical performance as a Cold Shrink splice.

Cold Shrink products incorporate the advantages of Push-on and Heat Shrink technologies, and more. It can accommodate a wide range of cable sizes as it is loaded onto a plastic core. Installation is very simple as it only requires the installer's hands. No specialised tools or torches are required. Cold Shrink products are typically expanded 30% to 150% on the cable. Therefore, Cold Shrink products seal tightly, retain their resiliency and pressure, even after prolonged years of ageing and exposure. They also provide a continuous pressure seal without the need for adhesives. These allow for expansion and contraction after installation. They also install consistently with respect to length and insulation thickness. Studies have shown that the electrical performance of the joint or termination is enhanced with higher interfacial pressure.

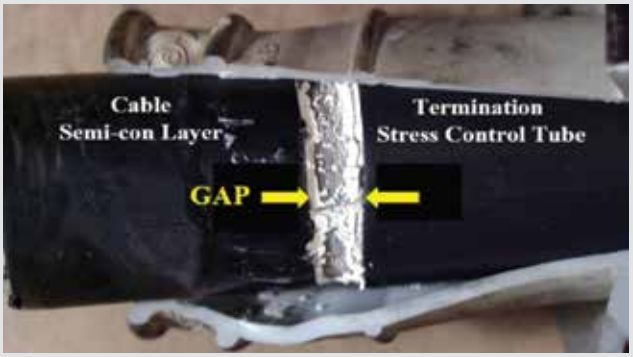
There are many issues to consider when selecting terminations and splices. All accessories, when installed correctly, will perform in the field. The material properties and how they function are critical, as well as the actual application, which must all be considered to make the proper selection. Because of the Cold Shrink materials' unique properties, Cold Shrink accessories move with the cable, as they goes through their load cycles, while continuing to provide excellent electrical performance and environmental sealing, thus providing long life and reliability.

Cable accessories form a crucial part in a power network. Cable preparation is very critical and heavily depends on the jointer's skill. Use of professional tools will reduce errors in the field. Cold Shrink cable accessories will reduce the number of steps, thus reducing the chances of making errors. Heat Shrink or Taping Technologies are highly dependent on the jointer's skill. Correct size crimping lug or connectors with the right size die, must be used to prevent overheating. Screw lugs or connectors will reduce such failures. Proper training including selection of correct materials and technology will eliminate failures in the network.

The following are some examples of jointers errors.

Mr Selvakumar can be reached at e-mail: selvakumar@mmm.com

Cable Accessories Failures due to Workmanship Errors



The stress control tube was not in contact with the insulation screen.



Deep cut caused by incorrect setting of scoring tool blade.

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Rated Ampere, Power	25 A, 5.5kW	
Water Ingress Protection	IP25.	
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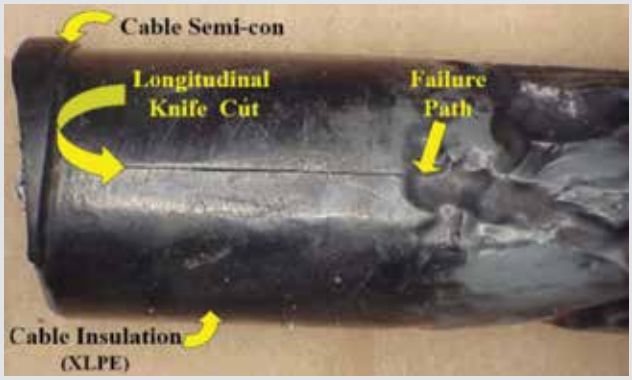
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..... Continue Medium Voltage Cable Accessories Technologies and Causes of Failure

Cable Accessories Failures due to Workmanship Errors



Splice body semi-conductive jacket was not in contact with insulation screen.



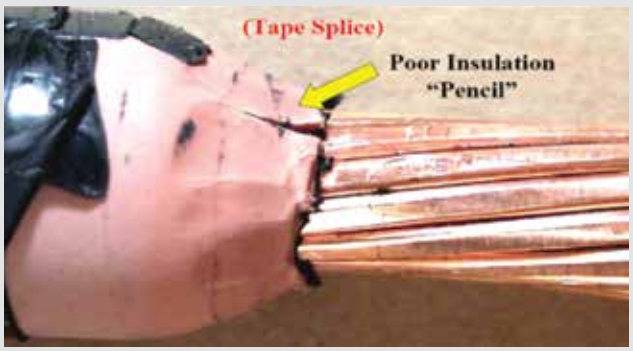
Deep longitudinal cut due to the use of knife.



Cable insulation screen extended into splice body.



Jagged uneven ring cut due to the use of a knife.



Proper penciling tools were not used to prepare the insulation.



Overheating of connector due to insufficient crimping.

..... Continue 26th JSC EEE Meeting in Sandakan 2018



Networking *– (third from left) Mr Siew Choon Thye (TEEAM Deputy President) posing with some delegates.*



Proud of you *– The Malaysian Delegation at the 26th JSC EEE Meeting.*

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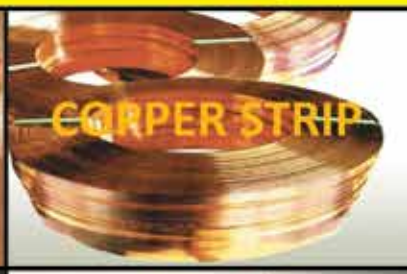
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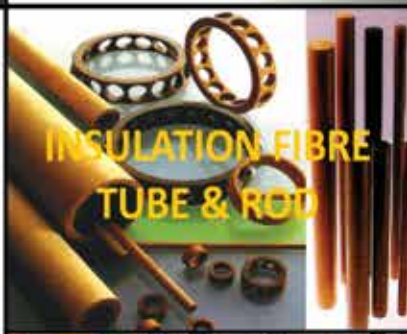
















IEC Young Professionals 2018 Programme

Shaping the Future of Global Standardisation and Conformity Assessment

This Report was prepared by Mr Alex Looi Tink Huey of IEM and Mr Lim Sai Seong of TEEAM.

The 9th International Electro-Technical Commission (IEC) Young Professionals (YPs) Programme was held from 22nd to 24th October 2018, in conjunction with the 82nd IEC General Meeting (GM) in Busan, Korea. The YPs are hand-picked by their National Committee (NC) to represent their country. This year, there were 80 YPs from 39 countries bringing together expert engineers, technicians, and managers from around the world to shape the future of international standardisation and conformity assessment in the field of electro-technology. The programme provided YPs the opportunity to amplify their voices in the international arena, enhance networking and engagement among YPs, develop awareness of the IEC's work, and ensuring the future of technology transfer. During the programme, YPs also got to meet peers, IEC Officers and technical experts from all over the world. Malaysia is an IEC Full Member, led by Standards Malaysia (National Standards Body) and the Malaysian National Electro-Technical Committee (MyENC). This year's Malaysian IEC YPs were represented by Mr Lim Sai Seong from The Electrical and Electronics Association of Malaysia (TEEAM) and Mr Alex Looi Tink Huey from the Institution of Engineers, Malaysia (IEM), who is also a member of TEEAM.

The IEC YP 2018 programme was hosted at the Busan Exhibition and Convention Centre (BEXCO) and the YPs were greeted with a warm welcome by the Korean Host Committee. The YP programme officially started with the IEC Presidential Address by Mr James M Shannon, where he highlighted that the IEC recognises young people who have a different understanding of technology and approach issues differently. He also highlighted the importance of having an open, forward-looking, transparent, nimble mindset and involvement in IEC, to serve the needs of the global market and improving the quality of life of the people. Mr Frans Vreeswijk, IEC General Secretary and CEO later gave the Welcoming Address, noting that many national standards are IEC standards, and that standards and conformity assessments were the two pillars of IEC. He further elaborated that Standardisation Evaluation Groups (SEGs) are established to identify new technical areas and anticipate emerging markets or technologies such as smart manufacturing, communication technologies, smart home/office building systems, and ethics in autonomous and artificial intelligence applications. Ms Katharine Fraga, IEC Head of Governance and Global Strategy, later introduced the IEC Masterplan comprising vision, mission, values, strategic objectives to enhance international trade, facilitate electricity access, and enable a more sustainable world. Ms Li Juan, one of the three IEC YP 2017 leaders, shared her involvement in the IEC YP programme where YPs got to experience the process of IEC standards' development and encouraging exchange of ideas.



Grand Celebration *– The Opening Ceremony of the 82nd IEC General Meeting 2018 in Busan, Korea.*

The morning session ended with a Q&A Session on IEC Operations. The Panelists were: Mr Robert McLaren (IEC Young Professionals Programme Co-ordinator), Mr Mark Amos (IECEx Business Manager), Mr Jonathan Colby (Director of Technology Performance, Verdant Power), Ms Katharine Fraga, Mr Adam Murdoch (Head of Electrical Equipment Safety & Efficiency, Energy Safe Victoria), Mr Philip Wennblom (Senior Director, Standards Policy, Intel Corporation), and Mr Mike Wood (General Manager, EME Strategy, Governance and Risk Management, Telstra Operations). The key items discussed during the Session included: the establishment of the IEC Market Strategy Board (MSB) to identify the needs of a new standard, and to improve the response to fast track standards for emerging technologies.



The IEC YPs 2018 Community *– The 80 IEC Young Professionals from 39 countries around the world.*

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..... Continue IEC Young Professionals 2018 Programme

This was then followed by a breakout session, where the YPs were separated into four groups to answer questions which revolved around the tasks and objectives of the MSB, such as how an organisation should anticipate future trends; what role YPs can play in identifying future technologies; and the proposal for a second event after this YP workshop. Nine YPs were selected to present their results and creative ideas to the IEC Officers. The IEC Officers present were: Dr Junji Nomura (IEC Immediate Past President), Mr Jo Cops (IEC Treasurer), Dr Shu Yinbiao (IEC Vice President), and Mr Frans Vreeswijk. We had the opportunity to present on organising and hosting the Electro-Technical Symposium & Exhibition as a second event after the YP workshop, by working with IEC YPs across the globe to focus on the objectives of promoting the importance of standards and global trade, and connecting people within the standards eco-system on the national and global level via teamwork and global collaborations.

Then, the YPs had the opportunity to attend and observe the Standardisation Management Board (SMB) and Conformity Assessment Board (CAB) meetings, which enabled the YPs to gain insight into how IEC management meetings operated. The IEC Council delegates to the SMB the management and supervision of the IEC's standards work: responsible for the setting-up and disbanding of Technical Committees (TCs) and Sub-Committees (SCs); approval of their scopes; appointment of TC/SC Chairs and allocation of secretariats; allocation of standards work; and timeliness of standards production. The CAB manages and supervises the IEC's conformity assessment activities, including oversight of the IEC conformity assessment systems: responsible for setting the IEC's conformity assessment policy; promoting and maintaining relations with international organisations on conformity assessment matters; and creating, modifying and disbanding conformity assessment systems. IEC brings together 170 countries, 20,000 standardisation experts, and over 100 TCs from every corner of the globe to share their expertise and collaborate on evolving needs and technological advances.

The YPs were then invited to attend the IEC GM 2018 Opening Ceremony, which was being attended by more than 3,300 IEC Delegates with the theme of the 82nd GM being – Smart Cities and Sustainable Societies. South Korea's President Moon Jae-in also welcomed the IEC Delegates to Busan. "The world today is experiencing a wave of innovation ushered in by the Fourth Industrial Revolution. Such innovation is a result of new technologies emerging in the electrical and electronics fields, with Artificial Intelligence, IoT and Big Data at the forefront. At this General Meeting, I hope to gather insights into the role and contribution of standardisation in responding to the Fourth Industrial Revolution," he said. This was followed by an exciting laser light show and the rich history of culture and story-telling of the Korean traditional dances.

On the second day, the YP programme began with the IEC Conformity Assessment by Mr David Hanlon (IEC CAB Secretary) and Mr Pierre Selva (Conformity Assessment & Market Surveillance Director, Global Industry & Government Affairs Strategy, Schneider Electric). They shared how Certification allowed leveraging between known brands and unknown brands, and further introduced the four IEC Conformity Assessment (CA) Systems: IECEE, IECEx, IECQ, and IECRE – each covering a dedicated segment of electro-technology whereby their ultimate objective is to facilitate global product acceptance by means of One Test, One Certification, and when appropriate, One Mark, valid in all markets. This was followed by a presentation from Mr Dennis Chew (IEC Regional Director, Asia-Pacific Regional Centre) on what to expect at a Technical Meeting, where he introduced the IEC standards development stages and the roles and responsibilities of TCs and SCs. Later on, the YPs were introduced to a simulation of an IEC Technical Meeting exercise on Electronic Baby Robots (EBRs) – Specifications for Design and Construction. The YPs were separated into groups to simulate the roles of the National Committees, that is, the National Research Council, National Association of Robotics Manufacturers, National Safety Council, National Robotics Users Group, and others. The rules and objectives of this Session was to gather all the YPs to participate and collaborate to reach consensus outcomes, and of course most importantly, to have wholesome fun.

The third day started with the interactive sessions on: Artificial Intelligence – Challenges, Opportunities and Standards; Getting



Standards Drive Global Value Chains *– Mr Alex Looi Tink Huey (IEC YP 2018, Malaysian Representative) presenting on the importance of standards and global trade, and connecting people within the standards eco-system on the national and global levels.*



Engrossed in Technical Discussions *– (extreme left) Mr Lim Sai Seong (IEC YP 2018, Malaysian Representative), followed by Mr Alex Looi Tink Huey (IEC YP 2018, Malaysian Representative) and the rest of the YPs during the interactive Session*



The Malaysian IEC Delegates *– (extreme left) Mr Lim Sai Seong (IEC YP 2018, Malaysian Representative), followed by Ir Abdul Rahim Ibrahim (Senior Director of Industry Planning and Development of the Energy Commission of Malaysia), Ir Mohamad Faudzi Mohd Yasir (Custodian (Distribution) and Group Technical Authority (Electrical) of Petronas) and Mr Alex Looi Tink Huey (IEC YP 2018, Malaysian Representative).*

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your Products on the Global Market – Fast; IEC Standards Development Processes; and Systems Approach – an Advanced Management of Standards Development. We had the opportunity to participate in the IEC standards development processes by Mr Pierre Sebellin (IEC Technical Department Manager). He shared the six governing principles of the development of International Standard: transparency, openness, impartiality and consensus, efficiency and relevance, coherence, and address the concerns of developing countries. Mr Sebellin further explained from the first step to initiate an International Standard project to the final draft and publication of the International Standard. This was followed by an open breakout session on Digital Transformation. Digital Transformation is the profound transformation of business and organisational activities, processes, competencies and models to fully leverage the changes and opportunities of a mix of Digital Technologies and their accelerating impact across Society, in a strategic and prioritised way, with present and future shifts in mind. The YPs were tasked to assist the Strategic Groups (SGs) 12, which is currently looking at Digital Transformation by identifying emerging trends, technologies and practices needed for IEC work, and to provide a platform for relevant discussion and collaboration. The YPs were then divided into groups to work on out-of-the-box ideas as per the following areas: Digital Transformation and developing countries; consensus in standards development using tools emerging from Digital Transformation; online authoring; and machine-readable format of standards. The YP programme on the third day ended with an Industry visit to the LG Electronics Changwon factory. This was organised by the Korean Host Committee. The factory attracted worldwide attention for its ability to produce one washing machine every 8.5 seconds.

The YPs also had the opportunity to explore Busan, which has many attractions, with amazing sceneries of mountains, beaches and a gorgeous port, acting as an attraction to the big City life. Beautiful and exciting places to check out in Busan includes the following Haeundae Beach (one of the most famous and beautiful beaches in Korea); Jagalchi Market (Busan's famous street stalls offering various fish dishes fresh from the sea; and Gamcheon Culture Village (also known as the Korea's Santorini, with brightly painted houses built in staircase-fashion on the foothills of a coastal mountain).

The IEC YP 2018 programme was a very successful event to bring the whole IEC YP community together, to share their thoughts with IEC and further involvement in IEC work. The programme also provides an exceptional platform for networking opportunities with more than 3,300 IEC Delegates from all over the world, to build knowledge, exchange creative ideas, and expand professional contacts. The programme also fostered a culture of innovation and teamwork among YPs, for them to be ahead of the technology curve in the electro-technical field. Mr Alex Looi Tink Huey (IEM), Mr Lim Sai Seong (TEEAM), together with Standards Malaysia, will continue to initiate the development of the IEC YP programme in Malaysia with a noble view to encourage the involvement of future generations in IEC work and also to develop consensus building skills which is essential for IEC work, as well as reaching out to Organisations, Conferences, Academia and Trade Associations.



IEC YPs Welcome Gathering *– (left) Mr James M Shannon (IEC President), and (right) Mr Alex Looi Tink Huey (IEC YP 2018, Malaysian Representative).*



All Smiles *– (extreme left) Mr Yue Xiaolong (IEC YP 2018, Sweden) followed by Ms Gong Xun (IEC YP 2018, China), Mr Lim Sai Seong (IEC YP 2018, Malaysia), Mr Alex Looi Tink Huey (IEC YP 2018, Malaysia), and Mr Liu Zheng (IEC YP 2018, China).*



IEM-TEEAM Collaboration *– (left) Mr Lim Sai Seong (IEC YP 2018, Malaysian Representative) from TEEAM, and (right) Mr Alex Looi Tink Huey (IEC YP 2018, Malaysian Representative) from IEM.*

Malaysian Young Professionals' Representatives at IEC YPs 2018 in Busan



Mr Alex Looi Tink Huey

Mr Alex Looi Tink Huey has two Bachelors' Degree in Electrical & Electronics Engineering and Software Engineering. He is the Head of Projects for Malim Consulting Engineers providing M&E consultancy services and turnkey project management for renewable energy power plants, commercial, and industrial developments; and Head of Projects for LAJ Engineering providing electrical service contracting services: electrical installation inspection, T&C of electrical equipment, power system studies, and power quality analysis. He is currently the elected Committee Member of the IEM Electrical Engineering Technical Division (EETD) and Chairman of the Activities Organising Committee. He is also a member of TEEAM.



Mr Lim Sai Seong

Mr Lim Sai Seong holds a Bachelor's Degree in Electrical and Electronics Engineering (Hons.), NU, Newcastle UK. He sits in several standards working committees under Standards Malaysia, Lembaga Lebuhraya Malaysia (LLM), Suruhanjaya Tenaga (ST), Public Works Department (JKR) and also MyCIE.

He is the Director of QAV Technologies, Malaysia's second National Testing Laboratory. Mr Lim is a member of IET and also the current Assistant Honorary Secretary of TEEAM for the year 2017 - 2019. He sits in the National Committee of CIE (NCCIE) and is the Treasurer of the Malaysia CIE Committee (MyCIE).

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State Associations News

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Badminton Tournament 2018

The Johor Bahru Electrical & Electronics Association (JBEEA) Badminton Tournament 2018 was held on Sunday, 7th October 2018, at the Daiman Johor Jaya Sports Complex, Johor Bahru. The Tournament was a Doubles Event and managed to attract 21 teams. The players consisted of JBEEA members' families, their staff and also their badminton buddies. The Tournament was a one-day event which started at about 8:30 am, with a short break at 1:00 pm and it finally ended at 4:00 pm. Even though the Players were exhausted, they certainly enjoyed the excitement of the Game and also bonded more closely together with one another in the spirit of true sportsmanship. Well done!



Strong participation *– Group photo taken before the start of the Tournament.*



Bravo! *– Congratulations to all the Winners!*

Factory Visit to Luvata Malaysia

Luvata Malaysia Sdn Bhd is a world-leading copper manufacturer with production plants spread across three Continents. They are part of the Mitsubishi Group, with extensive production bases located in Europe. Upon JBEEA's request to visit their factory, they cordially extended the invitation on 13th November 2018. A group of 33 people from JBEEA visited the Luvata Malaysia Sdn Bhd's plant in Pasir Gudang, Johor, which was chosen due to its strategic position in the heart of South-East Asia. The Visitors toured the factory and managed to witness the production process and were also given a briefing session. Luvata Malaysia's plant produces high quality and pure Copper Products, i.e., Copper Anodes, Copper Profiles, Copper Sections, Copper Strips, etc. The Company markets its products to manufacturers and fabricators throughout the Asia-Pacific region. The visit ended with a sumptuous meal provided by the host. JBEEA expressed their heartfelt thanks for Luvata's generosity.



Fruitful visit *– Snapshot at Luvata to keep in memory.*

TEEAM 66th Anniversary Dinner 2018

JBEEA Chairman, Mr Lee Chee Boon, attended the TEEAM 66th Anniversary Dinner at the One World Hotel in Bandar Utama, Selangor, on 29th September 2018. There was a Live Band performance, dances, magic show and lucky draw to entertain the excited guests. It was a truly memorable event and a highlight of the year for many.



Enjoyable nite *– A truly joyous occasion for remembrance.*

Charity Activity

JBEEA Members have always a thought for the underprivileged society members. During the 1st week of October 2018, a number of JBEEA Members volunteered to look into the necessities and needs of an Old Folks' Home in Skudai, Johor, called Persatuan Kebajikan Orang Tua Sam Poh. They attended to the electrical related works that needed repairs and replacements. With the intense hot weather these days, members also sponsored a few units of industrial fans, ceiling fan and some other electrical fittings. The inmates were truly grateful and appreciated the aid that was given to them.



Good job JBEEA! *– Kind contributions to the Home.*

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Courtesy Visit to Suruhanjaya Tenaga

On 29th August 2018, a 6-member Delegation led by the President of the Penang Electrical Merchants' Association (PEMA), Mr Khaw Tatt Siew, paid a visit to Mr Ismail Zaili Yusop (Suruhanjaya Tenaga – ST, Northern Director) to foster closer relationships between PEMA and ST (Energy Commission). Issues of mutual interest were discussed and ST helped to resolve some of the prevalent problems faced by PEMA Contractor members.

The meeting concluded with a presentation of Souvenirs. PEMA looks forward to working closely with ST for the betterment of the electrical supply industry.



Souvenir presentation *– A Token of Appreciation was presented to (right) Mr Ismail Zaili Yusop (Suruhanjaya Tenaga, Northern Director) by Mr Khaw Tatt Siew (PEMA President).*



Fruitful meeting *– A group photo taken at the end of the cordial and fruitful visit.*

Seminar on "The ECU Technology for Power Generation"

PEMA, together with Hong Seng Power Sdn Bhd, co-organised a one-day Seminar on "The ECU Technology for Power Generation" on 26th September 2018 at the Eastin Hotel in Penang. The joint Seminar was organised to introduce the benefits of Baudouin's R&D & Powerkit Engines, Development of Diesel Injection Technology, and Alternators. The Speakers were Mr Liu Cheng Long and Mr Harold Del Pila.

Hong Seng Power Sdn Bhd (hereinafter referred to as HSP), established in 1988, is a holding subsidiary of the Hong Seng Group. The company has over 100 staffs in Malaysia and concentrates on Marine Engines, Marine Gearboxes, Generator Sets, Rental of Generators plus Spare Parts and Accessories. Under the PTPOWER brand, HSP supplies end product of marine engines and power generator sets after the process of importing various components, re-assembling and re-engineering. The end products are distributed to some of the largest customers in Southeast Asia. Their market segments include Marine, Mining, Plantation, Construction and Industrial.

The Seminar was approved with BEM CPD hours and CIDB CCD points for all participants. It tremendously benefited electrical contractors, consultants, engineers, competent personnel and facility managers, who were in attendance.



For the album *– A group photo taken at the end of the Technical Seminar.*



Good response *– A group photo for the album.*

TEEAM 66th Anniversary Dinner 2018

PEMA Officials attended TEEAM's 66th Anniversary Dinner which was held on 29th September 2018 at the One World Hotel in Petaling Jaya. It was a meaningful Dinner for all PEMA members, to network and foster closer business bondings plus it was also to exchange the latest market information.



Catching-up *– (from left) Mr Khaw Tatt Siew (PEMA President), Ir Yong Ah Huat (TEEAM President) and Ir Darren Lee (PEMA Honorary Secretary).*

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EASS at TEEAM 66th Anniversary Dinner 2018

EASS extended strong support to TEEAM's 66th Anniversary Dinner. An 11-member Delegation flew in from Sibu to attend the Grand Celebration Dinner which was held on 29th September 2018 at the One World Hotel in Petaling Jaya. It was a fun-filled Dinner with great networking opportunities in the packed Ballroom.



Mr Hii Hua Chuon – *(right) State representative from the Electrical Association of Sarawak & Sabah (EASS). On the stage with him is Ir Yong Ah Huat (TEEAM President).*



Good networking – *(left) Mr Hii Hua Chuon (EASS Chairman) and Mr Choong Soon Yean (PKPPE President). Standing is Mr Fu Wing Hoong (TEEAM Past President). On the right is Mr Liang Kok Boon (TEEAM Council & Sports Chairman).*

Sarawak Energy's CTP Awards 2017/2018

The Sarawak Energy Berhad (Sarawak Energy) had embarked on the Contractor Transformation Programme (CTP) in 2017 to develop partnerships in promoting self-regulation and continuous improvement as well as enhancing discipline amongst its contractors. Sarawak Energy places top priority on safety at its project sites. "Contractor safety is essential in order to ensure safety excellence in our organisation as this is where most of the critical activities and exposure are involved," said Sarawak Energy Group Chief Executive Officer (CEO), Datuk Sharbini Suhaili, during the CTP Awards 2017/2018 Dinner which was held on 24th November 2018. The Dinner was held to recognise Sarawak Energy's contractors who are pro-active on the Health, Safety and Environment (HSE) aspects and had made significant contributions towards HSE excellence.

HSE excellence is one of the five key focus areas listed in the Sarawak Energy Excellence 2020 that aims to bring Sarawak Energy on par with the best utility company in the region. There is still much to be done in terms of inculcating the safety culture within the organisation and the contractors' community. Sarawak Energy will continue to record the occurrence of injuries in its operation and projects.

Datuk Sharbini further elaborated that a strong safety culture sets a corporate organisation apart, and only the right safety culture will guarantee the safety of all parties concerned. "Looking at the statistic that we have gathered for the past ten years, most accidents contributed to our lost time injury frequency rate, and fatalities were basically coming from the contractor side. Up to September 2018, we have lost a time injury frequency rate of 0.529, outside of the set limit of 0.5. We also had one fatality early this year at one of our sub-stations, and one fatality is one too many as far as I am concerned," stressed Datuk Sharbini.

He urged all parties to be vigilant as a single lapse of concentration or non-compliance would have very far reaching and long term consequences to the people, families and the company as well. At the Dinner, Datuk Sharbini presented nineteen Gold, Silver and Bronze CTP Awards to Sarawak Energy's contractors. Four members of EASS were amongst the proud recipients.



At the Awards Dinner – *(third from left) Mr Hii Hua Chuon (EASS Chairman) receiving the Gold CTP Award presented to his company, Hii Hua Chuon Electrical Works by Datuk Sharbini Suhaili (Group CEO of Sarawak Energy).*

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PW2 Wiremen Training Collaboration with KTYS

The Sabah Electrical Association (PES) is collaborating with Kolej Teknikal Yayasan Sabah (KTYS), to introduce the Single-Phase Wiring with Certification Endorsement (PW2) from the Energy Commission (Suruhanjaya Tenaga, ST) on part-time basis for working adults. A Press Conference on this meaningful Training collaboration was held in conjunction with KTYS Info Day 2018 on 1st December 2018 in Kota Kinabalu.

KTYS Deputy Chief Operating Officer, Mr Waky Taim said the Certification was the first formal collaboration with PES for working adults studying on a part-time basis at the Technical Campus in Sembulan in early 2019. The PW2 qualification from ST is a Competency Certification recognised by the Government and is the next step for students with the Sijil Kemahiran Malaysia (SKM) – Malaysia Skills Certification. It is also a step forward for a Contractor's Licence in wiring work projects. Entry requirements into the programme requires an applicant to be a Malaysian, aged eighteen years and above, having completed Form Five and with two years of working experience in the related field. An application would be submitted to ST for acceptance into the programme. The Training programme runs for a six-month period over the weekends.

PES President, Mr Leslie Jong Vui Kee, said that PES would strive to play an active part in informing its members and the public of such programmes which are available, in early 2019. It is hoped that through the initiative of this programme, the community would be able to advance and grow in tandem with the rapid expansion of the Science and Technology Era today, to remain highly competitive, especially in the field of electricity in the global marketplace.



After the Press Conference – *PES Officials posing with KTYS Staff Members. Fifth from left is Mr Leslie Jong Vui Kee (PES President) and on his left is Mr Waky Taim (Deputy CEO of KTYS).*

Persatuan Kekompetenan Penjaga Jentera & Pendawai Elektrik Perak (PKPPE)
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PKPPE at PEA 55th Anniversary Dinner 2018

The Persatuan Kekompetenanan Penjaga Jentera & Pendawai Elektrik Perak (Perak Electrical Chargemen & Wiremen Competence Association, PKPPE) Committee Members were present at the 55th Anniversary Dinner of the Perak Electrical Association (PEA). It took place on Sunday,12th August 2018 at Sun Lee How Fook Restaurant. The PKPPE Delegation was led by the President, Mr Chong Soon Yean.

The evening started at 7:00 pm with the arrival of VIP guests, which was then followed by a Welcome Speech by PEA President, Mr Chan Kaim Sam. The PEA President highlighted that the Government should be called upon to attract more foreign investments into the country to ensure the sustainable development of the national economy, and thus create more employment opportunities for young people in the industry. He hoped that electrical appliances Manufacturers-Distributors should seize business opportunities and promote energy saving and high-tech products to meet consumer needs, in order to further improve the quality of life.

Meanwhile, the TEEAM President, Ir Yong Ah Huat highlighted in his Speech that the newly elected Government would focus on renewable energy and pledged to increase the renewable energy from the current 2 percent to 25 percent by the year 2025. This would provide an opportunity for PEA members to venture into this area and contribute to increase the total RE achievement.

In terms of safety concerns, Ir Yong highlighted that sub-standard cables are found to be rampantly sold and used by the construction industry. He urged everyone to be vigilant and not to trade or use any sub-standard products which would compromise safety. Members in the E&E fraternity should play a good role model and start by purchasing or using genuine and safe electrical products. Members must support the Government's efforts in fighting against sub-standard products and be always vigilant - thus only promoting genuine and safe products.

The night continued with a Cake-Cutting Ceremony and entertainment event. The sumptuous Dinner ended at 10:30 pm.



Happy occasion *– A group pose with PEA President, Mr Chan Kaim Sam (5th from left).*



Cake-Cutting Ceremony *– VIPs and PEA Committee Members on stage.*

Courtesy Visit by IEM Perak Branch and TAM

The Institution of Engineers, Malaysia (IEM) Perak, and the Technological Association of Malaysia (TAM) Perak, visited PKPPE on 18th August 2018. Ir Simon Yeong, Vice Chairman of IEM Perak, invited PKPPE members to participate in the IEM Engineer Run 2018 and also to support their Gala Dinner 2018, to be held on 21st October 2018 at the Kinta Riverfront Hotel & Suites.

On the other hand, Ts Steven Shum, Vice President of TAM & Chairman of TAM Perak, elaborated on TAM's history, aim, mission and vision, member benefits and their past activities, to PKPPE and he hoped to create collaboration opportunities with a noble view to co-organise events in the future.



Group Photo *– Promoting the upcoming IEM Engineer Run and the Gala Dinner (seated from left) Ir Simon Yeong (Vice Chairman of IEM Perak), Mr Choong Soon Yean (PKPPE President) and Ts Steven Shum (Chairman of TAM Perak).*

Training Programme by Mikro Sdn Bhd

A half-day Training Programme by Mikro Sdn Bhd was held at the PKPPE premises on 27th August 2018. Consultants, dealers, contractors and users participated in this highly beneficial training.

The Training started with an ice-breaking introduction of each of the participants. The Training went on with the new series of Protection Relays and Digital Power Meter, followed by the Basic Protection and Relay Features as well as the Function Explanations. The Training ended with a Q&A Session and a sumptious Dinner.



Thank you *– (second from right) PKPPE Honorary President, Mr Khaw Yee Kuan, presented a Souvenir to a representative from Mikro Sdn Bhd. Accompanying them were (from left) Mr Leong Kok Wah (PKPPE Technical Advisor), Ir Fong Chin On (PKPPE Electrical Advisor), and Mr Choong Soon Yean (PKPPE President) on the far right.*



Understanding *– Participants concentrating on the Technical explanation.*



Group photo *– Participants and representatives from Mikro Sdn Bhd.*

PERDA 4th Charity Shield Dinner 2018

The PERDA 4th Charity Shield Dinner took place on Saturday 8th September 2018 at the Unique Seafood Restaurant and Banquet. A total of RM76,000.00 was donated at the 4th Charity Shield Dinner as educational funds, by generous Suppliers and enthusiasts who attended the event. A total of RM20,000.00 was donated to Charitable Foundations and the Save Malaysia Funds. This Charity event was in support of Welfare Associations, School Welfare Associations, Orphanages and "Save Malaysia Funds".

The event was inaugurated with a thunderous welcome by a thrilling Lion Dance performance. PERDA Chairman, Mr Wong Tet Woon AMP, in his Opening Speech, highlighted that the main purpose of this Charity Fund was to create a social atmosphere that was feasible for everyone to expand the influence through the appeal of charity. He also expressed his appreciation to all Sponsors who had generously contributed towards this noble event.

It was a dazzling night as the Host dressed in Malaysian traditional costumes created a delightful atmosphere with vibrant colours. The Dinner was delectable and was accompanied by amusing performances arranged by the professional Host.

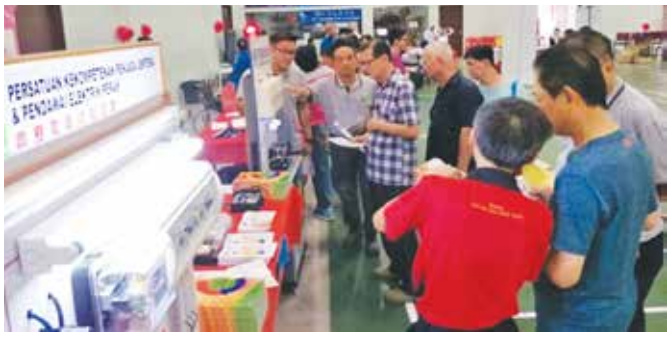


PERDA's Charity Dinner *– PKPPE members enjoying the night.*

RCCB Self-Test Awareness Programme

A half-day RCCB Self-Test Awareness CSR Programme was organised by the Kinta District Chinese Methodist Church. It took place at SJK(C) Sam Chai on 17th September 2018. The purpose of the event was to create awareness on the importance of RCCBs.

This CSR programme was an excellent opportunity for companies to demonstrate their good corporate citizenship initiatives by helping the Society. Throughout the event, seven volunteers from PKPPE, took turns to demonstrate how to test an RCCB. As the RCCB may be subject to failure after a period of time, it was suggested that it be tested once a month.



Public awareness *– The Working Committee explaining the importance of the self-testing of RCCBs*



Safety Roadshow *– PKPPE Working Committee on duty.*

The PKPPE Working Committee encouraged the public to use RCCBs and not ELCBs. They explained the benefits of using RCCBs and the disadvantages of using ELCBs. This widened the public's knowledge on how RCCBs could prevent any unnecessary accident and unfortunate death by preventing the leakage current from causing any damage or harm.

TEEAM 66th Anniversary Dinner 2018

On 29th September 2018, the Electrical and Electronics Association of Malaysia (TEEAM) celebrated its 66th Anniversary. A Grand Dinner was organised at the One World Hotel Banquet Room. PKPPE was invited to attend this auspicous event.

The Dinner started with a remarkable Opening Performance followed by a Welcome Speech by the Dinner Organising Chairman, Mr Siew Choon Thye, who later presented Tokens of Appreciation to the generous Sponsors.

The Guest of Honour was The Honourable (YB) Yeo Bee Yin, Minister of Energy, Science, Technology, Environment and Climate Change (MESTECC). YB then relayed a Speech with the concept of "3Is", that is, "Investment", Innovative" and "Integrity" with the electronics and electrical industry, saying that as long as the industry can implement this 3Is concept, she believed that Malaysia's future would reach the fourth concept of achievements, that is, "Incredible". The Minister also highlighted on the Government's future vision in order to preserve nature and to reduce pollution.

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Mr Choong Soon Yean *– President of PKPPE being introduced on stage as a State Representative.*

TEEAM President, Ir Yong Ah Huat, said during his Speech that TEEAM was ready to co-operate with the Government and provide assistance to achieve a win-win situation between our government and our country's electronics industry, by providing industry information to the Government and the electronics industry. This was to help the Government better understand this field and promote a friendlier policy. This would create a win-win situation for the commercial, local labour market and Government house. He also called on MESTECC and the Ministry of Transport to co-operate in order to make electric motorcycles and electric vehicles and bring them onto the roads as soon as possible so as to contribute to environmental protection.

The Night was enlivened with a number of astonishing Performances and Lucky Draws along with TEEAM's Best Contractor Awards Presentation. It was a very enjoyable and successful evening.



Smiles *– PKPPE Officials posing with The Honourable Yeo Bee Yin, MESTECC Minister.*

Technical Visit to ILP Kepala Batas, Penang

The Industrial Training Institute, Kepala Batas (ILP), had extended an invitation to PKPPE via a Technical Visit at ILP, Kepala Batas in Penang on 9th October 2018.

ILP is a part of the Manpower Department Training Institute (ILJTM), which provides technical manpower training programmes to the fast-emerging industrial section of the developing and developed economies. A 10-member Delegation joined the visit to ILP, Kepala Batas in the morning and they were greeted by Mr Zahari Md Zin, Department Head of ILP.

The enlightening Tour started with an Ice-Breaking Session where ILP and PKPPE exchanged highly beneficial information about both the organisations. This was followed by a Tour to the technical workshops. Then, there was a discussion on future collaboration between the Government and the private sector. ILP hoped that PPPKE could help to promote the ILP as a Government Training Institute which would provide Part-Time Chargeman and Wireman Courses to those working employees, with affordable fees.

At noon, the Delegation was welcomed by the Penang Deputy Chief Minister, Datuk Ahmad Zakiyuddin Abdul Rahman. Before dispersing, they were treated to a sumptuous meal by the Host.



Thank you *– Souvenir exchange between PKPPE and ILP*



Group photo *– The PKPPE Delegation posing with (8th from right) The Honourable Dato' Ir Ahmad Zakiyuddin Abdul Rahman (Penang Deputy Chief Minister) and (6th from right) Mr Zahari Md Zin (ILP Electrical Head of Department).*

IEM Perak Gala Dinner 2018

The IEM Perak Gala Dinner was held on Sunday, 21st October 2018, at the Kinta River Front Hotel's Rafflesia Ballroom. The Dinner was well attended by over hundreds of members. Eleven of PKPPE Officials were honoured to join the Dinner, including the President, Mr Choong Soon Yean. The Guest of Honour of the night was Committee Chairman for Investment and Corridor Development, Perak, Dato' Seri Ir Haji Mohammad Nizar Jamaluddin.

The night began with the Welcome Speech by the Chairman of IEM Perak, Ir Abdul Razak Ali. In his Speech, he introduced the IEM Perak branch which was established in 1983. He mentioned that the membership is currently about 3,100 members with a growth rate of about 4% per annum, making it one of the largest IEM branches in the country. To support the needs of members, IEM Perak created a Young Engineers' Section to support the different activities of the Committee.



Supportive *– Group photo of PKPPE Officials who attended the IEM Perak Gala Dinner.*

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After the Welcome Speech and Live Performance, the President of the Institution of Engineers, Malaysia, Ir David Lai Kong Phooi, delivered his Speech. IEM's next goal was to provide value-added services to its members through their profession, increase knowledge and connections by organising various Courses, Lectures and Conferences with local and foreign experts. He also informed that IEM was established in 1959 with 46 members and it has since increased to 49,709 members with twelve Branches, sixteen Technical Divisions and five Special Interest Groups.



On Stage *– Souvenir exchange between IEM Perak and PKPPE.*

Guest of Honour, Committee Chairman for Investment, Industry & Corridor Development, The Honourable Dato' Seri Ir Haji Mohammad Nizar Jamaluddin, in his Speech, proposed that IEM Perak make a request to the Perak State Government for the allocation of a piece of land to the Association for their new building, as a reward for their contribution to the local economy. He mentioned that engineers are playing an important role in assisting the country to move towards Industry 4.0. If everyone works hard and co-operates to bring the State into a base to attract local investors, it is believed that this would help to improve the income of Perak State. He also called on students who graduated from the Institute to join IEM to gain more learning opportunities.

The Dinner continued with a Cake-Cutting Ceremony and a Token of Appreciation presentation. The last Speech was delivered by the Perak State Economic Advisory Councillor, Mr Koon Yew Yin. He congratulated IEM Perak on their Anniversary Celebrations and donated RM100,000.00 to IEM Perak towards their Activity Fund.

The Night was overwhelmed with soft music and an exquisite Dinner.

Self-Test RCCB Safety Roadshow

Another Self-Test RCCB Safety Campaign Roadshow 2018 was held at the Marina Island Jetty Complex, Marina Island Pangkor, Lumut, on 10th November 2018. This event was a collaboration amongst the Energy Commission (Suruhanjaya Tenaga, ST) Perak, TEEAM, Benepark Sdn Bhd, Rockbund Fishing Chalet Sdn Bhd and PKPPE, to create awareness on how RCCBs could prevent unnecessary accidents and unfortunate deaths by way of preventing the leakage current from causing any damage or harm.

During the Opening Speech, the PKPPE President, Mr Choong Soon Yean, thanked the following for their support and attendance: Mr Muhammad Hasanol Mustafa (Assistant Director of ST, Perak), Mr Yong from Benepark Sdn Bhd, Ms Jennie Yew from Rockbund Fishing Chalet Sdn Bhd, including Ir Chang Yew Cheong, Mr Ooi Eng Guan and Ms Vince Lee from TEEAM. Their presence had helped to make the event a great success. He emphasised that this event was designed in such a way to enable information and hands-on experience of RCCB Self-Tests and that it could be delivered effectively to the public. In this way, the public can now examine the RCCB and even test it safely at home.

The PKPPE President highlighted that TEEAM and PKPPE had run the RCCB Campaign together for three times in Ipoh, Perak - in April 2015, June 2016 and August 2017. The Campaign had received encouraging response among the residents in Ipoh.

TEEAM Vice President, Ir Chang Yew Cheong, highlighted that this was the 22nd nationwide Roadshow since 2014. He also explained that the RCCB is an electro-mechanical device that detects and measures leakage current and is installed in the electrical distribution box inside the house. It may be subject to failure after a period of time. Therefore, regular tests to ensure that it is still functioning, needs to be carried out. An RCCB Demo Panel was used to guide the public on how to self-test the RCCB.

Mr Muhamad Hasanol Mustafa of ST also recorded his highest appreciation and thanks for the invitation by PKPPE and TEEAM for this RCCB Safety Campaign. He highlighted that ST had always supported the PKPPE and TEEAM for organising such safety programmes that could further spread awareness and provide consumers with electrical safety precautions. He also extended his gratitude to PKPPE and TEEAM for such a useful Campaign and the co-operation that had been given to ST all along. He hoped that this good working relationship would continue into the future.

The RCCB Self-Test Roadshow started with a short Demo to the general public by TEEAM's Assistant Honorary Treasurer & Publication Chairman, Mr Ooi Eng Guan. A Token of Appreciation was presented by the PKPPE President to Mr Muhammad Hasanol Mustafa (Energy Commission of Perak), Mr Yong (Benepack Sdn Bhd), Ms Jannie Yew (Rockbund Chalet Fishing Sdn Bhd) and Ir Chang Yew Cheong (TEEAM).

The public was encouraged to have hands-on demos to test the RCCB device. Overall, it was a successful event.



Roadshow Opening *– Speech by the PKPPE President, Mr Choong Soon Yean.*



Collaboration *– A group photo for the album.*

..... Continue State Associations News

Technical Visit to the Chenderoh Hydro-Electric Power Plant

PKPPE organised a Technical Visit to the Chenderoh Hydro-Electric Power (HEP) Plant at Tasik Chenderoh, near Kuala Kangsar in Perak, Malaysia, on 13th November 2018. Upon arrival, the Delegation was welcomed by Mr Khairul Azhar of the Power Plant.

The Chenderoh Hydro-Electric Power Plant is the oldest power plant in Malaysia. It was built in 1926. It was one of the hydro plants along Sungai Perak which consisted of other stations such as Temenggor, Sultan Azlan Shah Bersia, Sultan Azlan Shah Kenering, Sg Piah (Hilir), Sg Piah (Hulu) and Sultan Ismail Petra Pergau.

The Delegation was briefed on the safety measures and awareness inside the power plant. They were then introduced to the power plant, the history and the operation philosophy, single line diagram explanation, scheme layout, type of hydro turbines, operation mode, etc. At the end of the briefing, the PKPPE President, Mr Choong Soon Yean, presented a Token of Appreciation to Mr Khairul Azhar.

During the Technical Tour, Mr Khairul Azhar led the Delegation to visit the Control Room at the Power House and also guided them to walk through the Dam's Tunnel. He explained about the operation of the hydro-electric power plant.

The purpose of having this Chenderoh Hydro-Electric Power Plant was to be a back-up whenever there was a breakdown of the coal power plant. The participants were mesmerised with how the dam worked so fine, although it is the oldest hydro-electric dam in Malaysia.

The PKPPE Delegation gained a lot of useful knowledge, experience and excitement in this very meaningful Technical Visit.



Interesting *– The PKPPE Delegation having a group photo with Mr Khairul Azhar (3rd from left) with a nice and commanding view from above the Dam.*

Fruitful visit *– Group photo after the Technical Visit.*

The Perak Electrical Association

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Hensel Enclosure/Junction Box and Solar Energy Seminar

With the objective to enhance members' knowledge, The Perak Electrical Association (PEA), organised a 1-day Seminar of Hensel Enclosure/Junction Box (IP65) and Solar Energy, on 10th October 2018, at PEA's Seminar Room. It was conducted in collaboration with BAE Industrial Engineering Sdn Bhd and Solar Sunyield Sdn Bhd to enrich and promote solar system applications. The Seminar received a good turnout comprising PEA Members who had registered.



Full attention *– Seminar in progress.*



Fruitful *– A group photo for the album.*

TEEAM 66th Anniversary Dinner

PEA President, Mr Chan Kaim Sam, together with his pro-active members, were present at the celebration of the 66th Anniversary Dinner of TEEAM which was held on 29th September 2018 at the One World Hotel in Petaling Jaya. It was a memorable night for all and created a good opportunity to strengthen relationships among the State Associations.



On the stage *– PEA President, Mr Chan Kaim Sam (right), being introduced as the State Representative of PEA in the TEEAM Council.*

..... Continue State Associations News

Sarawak Electrical Association

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SIBEC 2018

The inaugural Sarawak International Business Exhibition and Conference (SIBEC) 2018 was organised by the Sarawak Business Federation (SBF) and was supported and endorsed by the Sarawak State Government, with the objectives to promote business and investment, to support the transformation of Sarawak's Digital Economy and to showcase the promotion of Digital Technology in Sarawak.

Sarawak Electrical Association (SEA) is one of the founding members of SBF, and plays an important role in the Engineering sector in Sarawak. The Federation members' business industries cover Energy, Agriculture, Tourism, Technology, Trade and Investments, Commerce, Manufacturing and many more. Sarawak is well positioned to introduce and offer several business-industry initiatives in line with the Government's focus to leapfrog Sarawak into the Industrial Revolution 4.0.

Themed 'Digital Technology Drives Business', SIBEC objectives included promoting business and investments to support the transformation of Sarawak's Digital Economy and to showcase the promotion of Digital Technology in Sarawak.

The two-day SIBEC 2018 event was launched by The Honourable Chief Minister of Sarawak, Datuk Amar Abang Johari Tun Openg. Also present during the launch were SBF President, Datuk Abang Abdul Karim Tun Openg; Deputy State Secretary, Datuk Dr Sabariah Putit and the SEA Chairman, Dato' Sri Ir Peter Lu.



For the album *– SBF Founding Members posing with The Honourable Chief Minister of Sarawak, Datuk Amar Abang Johari Tun Openg and other VIPs.*



VIP Tour *– The Honourable Chief Minister of Sarawak, Datuk Amar Abang Johari Tun Openg being guided by SBF Founding Members, to SIBEC 2018.*

SEA at TEEAM 66th Anniversary Dinner 2018

SEA joined the Celebration Dinner of TEEAM's 66th Anniversary which was held on 29th September 2018 at One World Hotel, Petaling Jaya. The Dinner was a Grand occasion with many VIPs and a whopping 118 tables! The Guest-of-Honour was The Honourable Yeo Bee Yin, Minister of Energy, Science, Technology, Environment and Climate Change (MESTECC). The night was entertaining with live musical instruments, singing performances, delicious Chinese course dishes, beer and good networking to top it up. It was a good Dinner to cherish indeed.



For the album *– SEA Officials and their family members.*



All smiles *– Dato' Sri Ir Peter Lu (SEA Chairman), The Honourable Yeo Bee Yin (MESTECC Minister) and Dr Jye Lu (SEA Member).*

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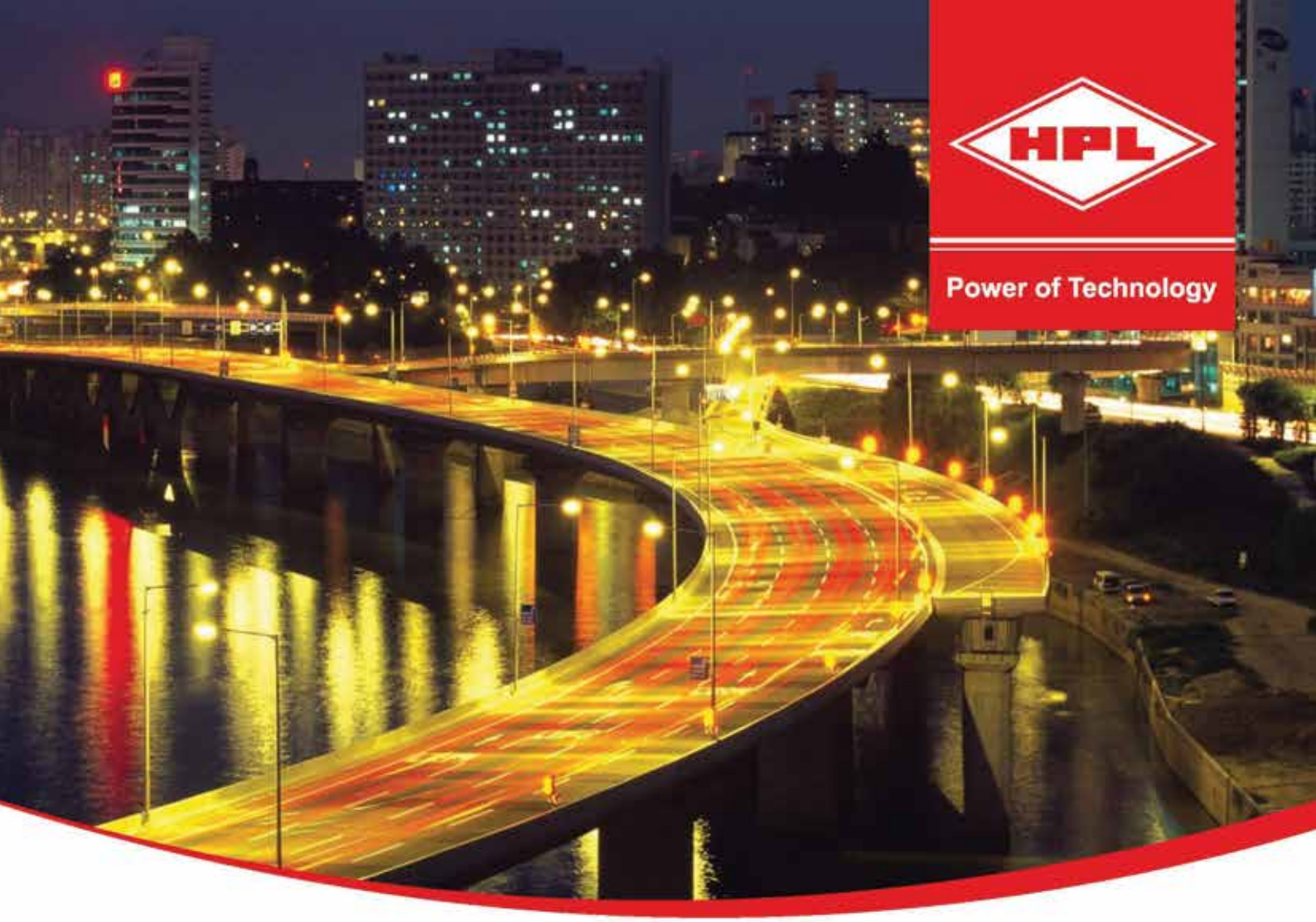
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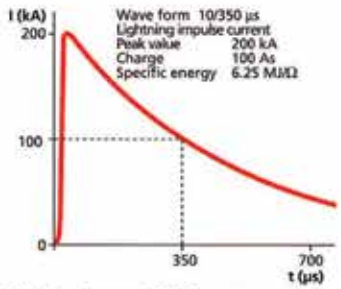


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Bowling Tournament 2018

TEEAM's Annual Bowling Tournament 2018 was successfully held in the afternoon of Sunday, 21st October 2018 at the Sunway Pyramid Mega Lanes in Petaling Jaya. Participants comprised members and their employees with a total of 46 Men and 35 Lady Bowlers vying for the Championship. The mode of play for the Men's Singles event was six games pinfalls whereas for the Ladies' Singles event, it was four games pinfalls. The events were Men's Single, Ladies' Single and the Team Event which consisted of three Male bowlers and one Female bowler. It was a smooth running Tournament as players were very enthusiastic and showed strong fighting spirit for every event in which they had participated. A big thank you to Chi-Tak Electrical (Selangor) Sdn Bhd for sponsoring the bowling t-shirts. The Tournament Winners are as announced on page 77.



Good networking *– An event to gather together and to forge closer ties.*



Get-Set-Go! *– Contingent from Omron.*



Cheerio *– Support from Gruppe bowlers.*



For the album *– Participants from Success Electronics.*



Exciting moment *– Eagerly awaiting the official results.*



Happy rolling *– A group photo of all golfers before the start of the Game.*

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..... Continue Bowling Tournament 2018



Official roll-off *– TEEAM's Sports Chairman, Mr Liang Kok Boon, doing the honours.*



Thank you message *– (2nd from left) Mr Liang Kok Boon (TEEAM Sports Chairman) delivered his Speech before the Prize Presentation Ceremony.*



Lucky position winner *– Ms Charmine Foong (Lotus Power) received a souvenir from Mr Liang Kok Boon (TEEAM Sports Chairman).*



Ladies' Champion *– Ms Mandy Yong (Omron) receiving the Chi-Tak Challenge Trophy, a Replica and AEON Cash Vouchers of RM250 from Mr Simon Leong (TEEAM Vice President). She scored 622 pins.*



Men's Champion *– (right) Mr Ajah Maidien (Sunway Engineering) receiving the Chi-Tak Challenge Trophy, Replica and AEON Cash Vouchers of RM300 from Mr Simon Leong (TEEAM Vice President). He scored 1,032 pins.*



Team Event Champion *– The winning team of Sunway Engineering receiving Trophy and AEON Cash Vouchers from (centre) Mr Ooi Eng Guan (TEEAM Assistant Honorary Treasurer & Publication Chairman). Their total team score was 3,553 pins. (From left) Mr Derrick Tang, Mr Naquiddin, Mr Ajah Maidien and Ms Jessie Chow.*



Awesome *– Congratulations to all the Winners!*

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Congratulations to Our Bowlers

Men's Singles Event

Champion
Ajah Maidien
Sunway Engineering Sdn Bhd
Chi-Tak Challenge Trophy + Replica + AEON Cash Voucher of RM300

1st Runner-Up
Shaharin Tuah
Indkom Engineering Sdn Bhd
AEON Cash Voucher of RM250

2nd Runner-Up
Naquiddin
Sunway Engineering Sdn Bhd
AEON Cash Voucher of RM200

4th Prize
Alias Ahmat
Indkom Engineering Sdn Bhd
AEON Cash Voucher of RM150

5th Prize
Goh Tzer Nam
Cupex Electrical Sdn Bhd
AEON Cash Voucher RM120

6th Prize
Gallen Loh Yee Hin
Omron Electronics Sdn Bhd
AEON Cash Voucher RM100

7th Prize
Shukri Omar
Omron Electronics Sdn Bhd
AEON Cash Voucher RM80

8th Prize
Derrick Tang Beng Khuan
Sunway Engineering Sdn Bhd
AEON Cash Voucher RM80

High Games
Mohd Fahmi Aizam Ibrahim
Success Electronics & Transformer Manufacturer Sdn Bhd
Bath Towel

High Series (Game 1, 2, 3)
Muhammad Hazim Alias
Success Electronics & Transformer Manufacturer Sdn Bhd
Bath Towel

High Series (Game 4, 5, 6)
Koh Jui Seng
Active Hi-Tech Engineering Sdn Bhd
Bath Towel

10th Position
Muhammad Hazim Alias
Success Electronics & Transformer Manufacturer Sdn Bhd
Bath Towel

20th Position
Lee Kok Wei
Success Electronics & Transformer Manufacturer Sdn Bhd
Bath Towel

30th Position
Jason Chow
Lotus Power Corporation Sdn Bhd
Bath Towel

Ladies' Singles Event

Champion
Mandy Yong Sim Min
Omron Electronics Sdn Bhd
Chi-Tak Challenge Trophy + Replica + AEON Cash Voucher of RM250

1st Runner-Up
Tai Kui Har
Active Hi-Tech Engineering Sdn Bhd
AEON Cash Voucher of RM200

2nd Runner-Up
Jessie Chow Yoke Lan
Sunway Engineering Sdn Bhd
AEON Cash Voucher of RM150

4th Prize
Nurul Huda Ishak
Success Electronics & Transformer Manufacturer Sdn Bhd
AEON Cash Voucher of RM100

5th Prize
Khairul Bariyah Mohyi
Success Electronics & Transformer Manufacturer Sdn Bhd
AEON Cash Voucher of RM80

6th Prize
Norliza Azman
Indkom Engineering Sdn Bhd
AEON Cash Voucher of RM50

7th Prize
Anisah Sharrif
Gruppe Lighting Solution Sdn Bhd
AEON Cash Voucher of RM50

8th Prize
Faridah
Success Electronics & Transformer Manufacturer Sdn Bhd
AEON Cash Voucher of RM50

High Games
Mandy Yong Sim Min
Omron Electronics Sdn Bhd
Bath Towel

High Series (1, 2)
Ramziah Deraman
Success Electronics & Transformer Manufacturer Sdn Bhd
Bath Towel

High Series (3, 4)
Heryana Harun
Success Electronics & Transformer Manufacturer Sdn Bhd
Bath Towel

10th Position
Nurul Shafiqah Kamarudin
Success Electronics & Transformer Manufacturer Sdn Bhd
Bath Towel

20th Position
Charmine Foong Kit Weng
Lotus Power Corporation Sdn Bhd
Bath Towel

TEAM Event

Champion
Ajah Maidien, Derrick Tang Beng Khuan, Naquiddin & Jessie Chow Yoke Lan
Sunway Engineering Sdn Bhd
Trophy + AEON Cash Voucher of RM200

1st Runner-Up
Alias Ahmat, Shaharin Tuah, Suhaizuki Abdullah & Norliza Azman
Indkom Engineering Sdn Bhd
Trophy + Bath Towel + Caps

2nd Runner-Up
Gallen Loh Yee Hin, Shukri Omar, Alvin Choi Kwok Wah & Mandy Yong Sim Min
Omron Electronics Sdn Bhd
Trophy + Bath Towels

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Brewery Tour to Heineken Malaysia

On the afternoon of 4th October 2018, a Delegation of 21 Council and Committee Members from TEEAM visited Heineken Malaysia Berhad. On hand to receive the TEEAM Delegation was Ms Ariamalar, Customer Service Assistant of Heineken. After getting a brief introduction on Heineken and its products, the Council and Committee Members went on a guided tour around the manufacturing plant. They had the opportunity to understand and know about their favourite beers' brewery process.

Heineken Malaysia Berhad is a major producer of beer and stout in Malaysia. Among the brands they produce and market are Tiger Beer, Guinness, Heineken, Anchor Smooth, Anchor Strong, Kilkenny, Anglia Shandy, Malta, Paulaner, Strongbow and Sol. The most important raw materials used in the brewing of Heineken beer are malted barley, hops and water. Together with yeast, these ingredients are used in a centuries'- old brewing process. Fermentation takes seven days, and it takes 28 days to process the fermented beer. The Heineken factory is fully automated and operates with minimal staff in their daily production routine.

The Delegation later enjoyed the "happy hours", and of course with Heineken beer after the walking tour. TEEAM wishes to record its highest appreciation and sincere thanks to Heineken Malaysia for an interesting tour and their warm hospitality.



Introduction *– An overview briefing on Heineken Malaysia and its brand by Ms Ariamalar, Customer Service Assistant.*



Cozy environment *– TEEAM Delegation gathered at Tarven, Heineken Malaysia.*



Cheers! *– Beer tasting after the plant tour.*



Appreciation to Heineken Malaysia *– Group photo taken for the album.*

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MBAM OneBuild 2018

MBAM OneBuild 2018, the Construction Industry Exhibition and Conference, is a yearly event that is aimed to bring the construction industry players under one roof for all of their construction needs. The 2018 edition was held from 13th to 15th November 2018 at the Kuala Lumpur Convention Centre. Organised by MBAM OneBuild Sdn Bhd and in co-operation with Master Builders Association Malaysia (MBAM), the event was endorsed by Construction Industry Development Board Malaysia (CIDB) and Malaysia External Trade Development Corporation (MATRADE); and was also supported by numerous local and overseas Trade Associations including TEEAM.

This premier building construction event provided an excellent welcoming platform for industry players in generating new relationships, exchanging of ideas, learning the latest innovations and making good business even better. MBAM OneBuild remained at the forefront of the construction industry by way of showcasing innovative technology and cutting edge solutions, as well as connecting the industry pioneers, thought leaders and thousands of industry professionals with one another.

MBAM OneBuild 2018 was held concurrently with the 44th Convention of IFAWPCA, the International Federation of Asian and Western Pacific Contractors' Associations, which was hosted by MBAM in Kuala Lumpur.

Next year's edition of MBAM OneBuild will be held from 29th to 31st October 2019.



Establishing Win-Win Ties *– Delegates posing for the album during the Opening Ceremony of MBAM OneBuild 2018.*



At the MACRA booth *– (far right) Ir Chang Yew Cheong (TEEAM Vice President) visited the MACRA (Malaysian Air-Conditioning & Refrigeration Association) booth. 2nd from right is Dato' Andy Kwan (MACRA President).*



At the TEEAM booth *– (left) Ir Chang Yew Cheong (TEEAM Vice President) posing with some visitors.*



Interesting *– Visitors were attracted to the display at the Show.*

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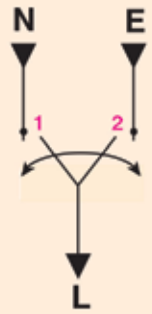
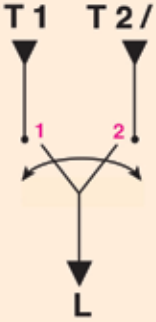
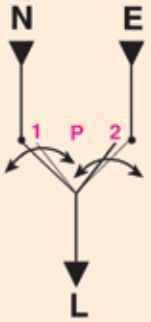
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Nanomaterials for Advanced Hybrid Supercapacitor Electrical Storage Systems and Applications

Ir Dr Ng Kok Chiang
Syarikat Pembaiki Letrik Leong Hing

This paper was presented by Ir Dr Ng Kok Chiang at the AFEEC-FAPECA Conference 2018 on Energy Storage Solutions which was held on 20th September 2018 at SMX Convention Centre, Pasay City, Manila.

Abstract

The development of next generation high-energy and high-power aqueous supercapacitors is vital in an era when power demand has peaked. In terms of engineering related issues at the micro level, the major area urgently requiring attention is the development of new nanocomposite materials. This article reports on nanocomposites which demonstrate superiority in terms of three-dimensional structure and which possess electrical conductivity equivalent to metallic conductors as a result of CNTs which complement the high redox-active properties of the transition metal oxides. Such combined contributions, when applied in supercapacitors, lead to increased charge storage capabilities and exceptional cycling stability. Two nanocomposites, namely, CNTs/SnO2 and CNTs/MnO2, were synthesised their physicochemical properties examined by X-ray diffraction, scanning electron microscopy, cyclic voltammetry and galvanostatic charge-discharge. The nanocomposites show superior results in terms of charge-storage mechanisms, cycle life, and electrochemical kinetics. Uniquely, in this paper, CNTs/SnO2 nanocomposites were also reported as an alternative negative electrode material to the commonly used activated carbon in asymmetrical supercapacitors.

1.0 Introduction

Energy efficient and robust power devices are key to overcoming the daunting challenges of climate change and the depletion of the earth's fossil fuels. As a result of an extensively diversified and globalised energy market, electrochemical capacitors, which are also known as supercapacitors, are becoming one of the vital energy-storage devices of the 21st century. This is because electrochemical capacitors bridge the crucial performance disparity between high energy-density fuel cells or batteries and high power-density traditional capacitors. The necessary developmental advances can be achieved through innovations in pseudo-capacitive nanocomposites of transition metal oxides and Carbon Nano Tubes (CNTs) which combine both ion adsorptions (interfacial capacitance) and fast redox reactions (pseudo-capacitance) for energy storage.

In addition to enhancing the core performance of supercapacitors, there is also a need to develop materials which offer an alternative to activated carbon as a negative electrode material in asymmetric aqueous electrochemical capacitors. There have already been many studies of probable positive electrode materials for supercapacitors, especially those with very good pseudo-capacitive properties as they are able to outperform the traditional electrical-double layer storage mechanism. The simple logic therefore is to search for a low cost metal oxide that is active in the negative potential range, such as tin oxide (SnO_2), which has been examined extensively as the negative electrode material in lithium ion batteries [1-4]. Lithium ion battery research has already progressed to combining SnO_2 [5, 6] and CNTs as a promising anode candidate, owing to the excellent mechanical and electrical properties of CNTs [7-9], SnO_2 has only recently been studied in supercapacitors as the positive electrode material [5-9].

In order to address these separate challenges, two different nanocomposite materials have been synthesised. In the case of core performance improvement, a Carbon NanoTube Manganese Oxide nanocomposite (denoted CNTs/MnO_2), was synthesised by the redox deposition method[1]. In this approach, KMnO4 was used as an oxidant which would react with the CNTs, to be reduced to an insoluble form of MnO_2 in an aqueous solution. This precipitate then anchors itself onto the surface of the CNTs to form the CNTs/MnO_2 nanocomposite [10-14]. Such composites were previously reported to exhibit very high electrode specific capacitance (≥5.0 F/cm^2) in the positive potential range [10].

For the production of a new negative electrode material for aqueous asymmetric supercapacitors, a nanocomposite of Carbon NanoTubes and Tin Oxide (denoted CNTs/SnO_2), was synthesised in which Tin Oxides were coated on the surface of individual CNTs. Good understanding of the science of materials is important for practicing engineers to fully comprehend the nature, capabilities and ratings of energy devices that are increasingly being built with these advanced nanocomposite materials.

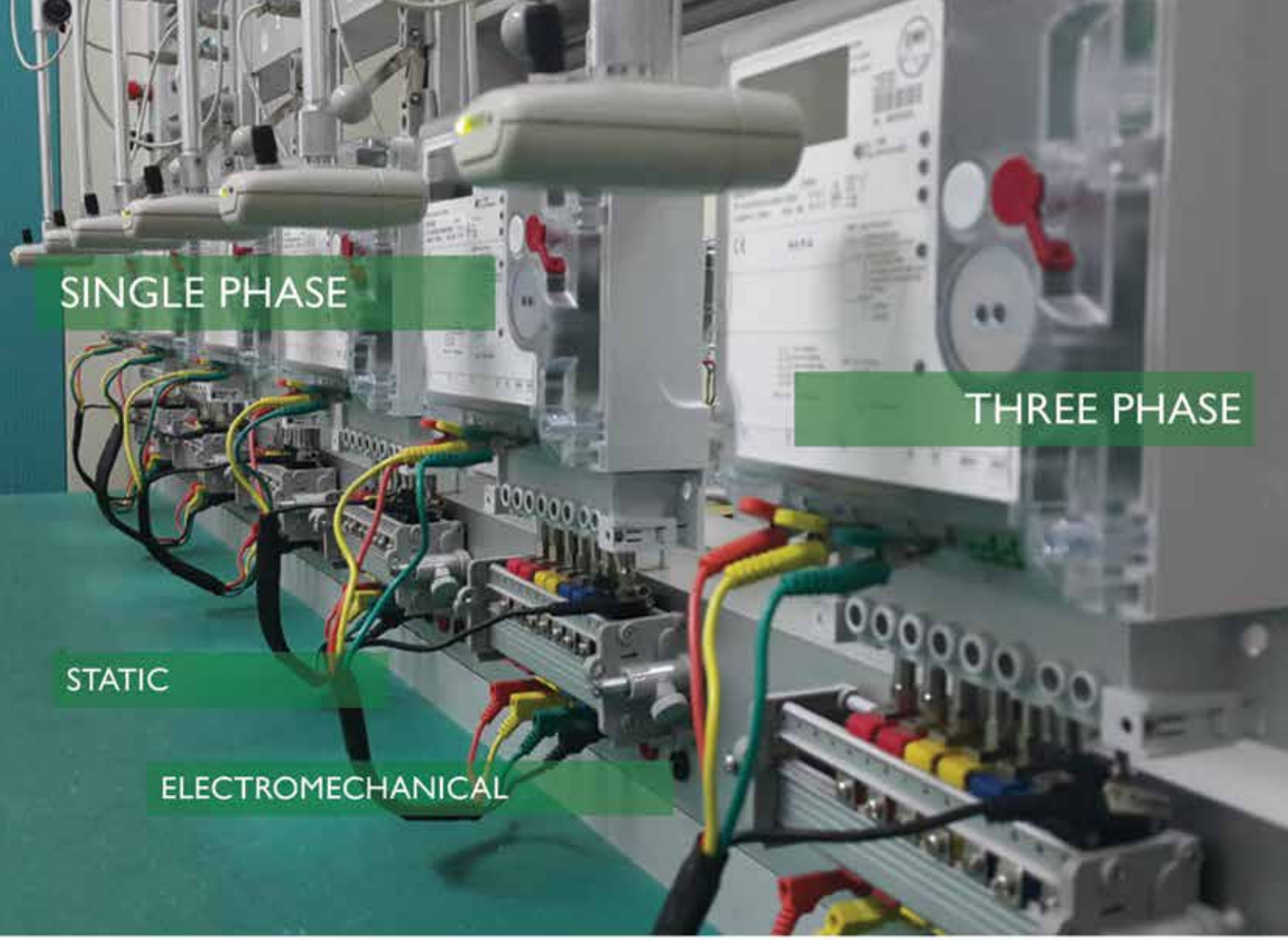
2.0 Methodology

CNTs/MnO_2 nanocomposite synthesis — The CNTs/MnO_2 nanocomposite was synthesised via spontaneous redox deposition of $MnO_2$2 on the CNTs in the KMnO4 aqueous solution as previously reported[2]. In this synthesis, one gram of $KMnO_4$ (Fluka ≥99.0% (RT)) was dissolved in 50.0 mL of deionised water in an Erlenmeyer flask before the addition of acid-treated CNTs (to form a nanocomposite of CNTs/MnO_2 of 4:6 w/w). The resulting mixture was continuously stirred for nine days in the covered flask until the purple colour disappeared. During and after the reaction, clear solutions gradually appeared, with the product settling to the bottom of the flask. The resulting nanocomposite was filtered, washed and dried in the oven overnight at 60˚C.

CNTs/SnO_2 nanocomposite synthesis — In the synthesis of the CNTs/SnO_2, 1.0 g of tin (II) chloride dihydrate (Fisher 97+%) was dissolved in 50.0 mL of deionised H_2O in an Erlenmeyer flask and 1.0 mL of HCl (38%) was added and stirred continuously for 1.0 hour to dissolve the tin (II) chloride. Then, the acid-treated CNTs were added to the solution and stirred for 24 hours at room temperature to form a nanocomposite of CNTs/SnO_2 of 4:6 w/w. The resulting mixture was then filtered, washed and dried overnight at 60˚C in a conventional oven.

Chemical and structural characterisations – The nanocomposites, all in the powder form, were characterized by X-Ray Diffraction (XRD, Hiltonbrooks DG3 generator plus Philips PW1050/25 goniometer, CuK radiation), an environmental scanning electron microscope (SEM, Philips FEI XL30 FEG-ESEM), a low resolution TEM (LR-TEM, JEOL 2000FX), and a high resolution TEM (HRTEM, JEOL 2100F).

Preparation of the electrode and electrochemical analysis – The nanocomposite (34.2 mg) with a binder (3.0 mg, 60% w.t. aqueous emulsion of polytetrafluoroethylene, PTFE, Aldrich) was thoroughly dispersed in 4.0 mL of deionised water. The mixture (10.0 µL, with



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0.0855 mg of the nanocomposite) was drop-cast onto a graphite disc working electrode (0.5 cm in diameter) using an electronic micropipette (EDP3 Rainin LTS, 10-100 µL, with wide orifice tips). Upon evaporation, the resulting thin film (13.44 µm on average thickness) on the electrode was dried in a desiccator overnight before electrochemical tests (AUTOLAB PGSTAT30) in a one-compartment three-electrode cell with the Ag/AgCl (3.0 M KCl) reference electrode and a graphite counter electrode at room temperature.

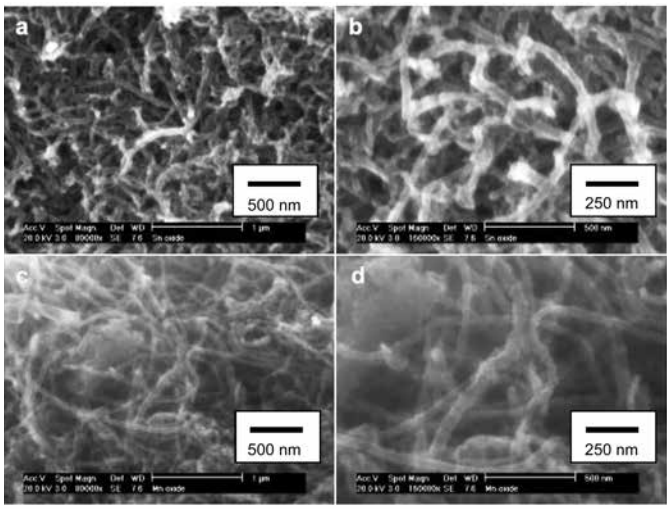


Figure 1. SEM images of the nanocomposites at different magnifications, i.e. 80,000x and 160,000x (a, b) acid-treated CNTs, (c, d) CNTs/SnO_2 and (e, f) CNTs/MnO_2.

3.0 Results and Discussions

Figure 1 shows the SEM images of the acid-treated CNTs after SnO_2 (a, b) and MnO_2 deposition (c, d) at two magnifications as indicated. The images of the CNTs/SnO_2 and CNTs/MnO_2 nanocomposites show that they retained the bundle nature and the three-dimensional entangled structures originating from the as-received CNTs. This shows that the SnO_2 and MnO_2 deposits did not block the opening and the porous structure which is inherent to the CNTs. The porosity can be observed as the dark spots in Figure 1, which are also the spaces created due to the nature of the CNTs. Maintaining such configurations assists the movement of the ions into and out of the positive and negative electrodes of the nanocomposites as mentioned previously. The SEM images of the nanocomposites demonstrate that thin coatings of the metal oxides exist around the CNTs. The jagged and consistent coarse surfaces, especially for the CNTs/SnO_2 nanocomposite, illustrate the evenly distributed SnO_2 on the surface of individual CNTs throughout the structure. The coating can only be further confirmed and substantiated by TEM images in Figure 2, 3, and 4 in the subsequent sections.

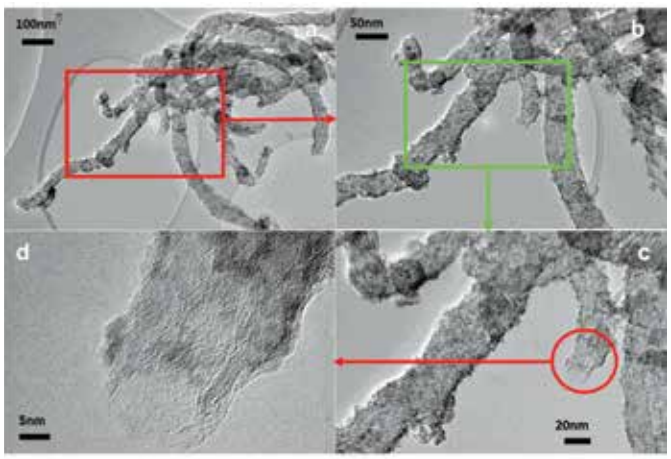


Figure 2. TEM images of the CNTs/SnO_2 60% w.t. nanocomposite; (a) and (b) overviews of the fully SnO_2-coated CNTs, (c) and (d) TEM images of enlarged micrographs depicting the open-ended tube of a CNT coated with a nanocrystalline coating SnO_2.

As for the SEM analysis, the TEM images of the overall CNTs/SnO_2 60% w.t. confirmed that the nanocomposite retained the bundle nature of the CNTs as can be seen in Figure 2 (a). It is noted that almost all the CNTs or CNT bundles in the sample are individually coated with thin and uniform layers of SnO_2. Enlarging the image of the end of one of the nanocomposite's fibrils reveals a very thin coating of nanocrystalline SnO_2 of about 5 nm width as can be observed in Figure 2 (d). This also demonstrates the nature of the open-ended CNT, the fact that the nanocrystalline SnO_2 is coated onto the CNT even to the very tip. It is also notable, as shown from the bundle in Figure 2(a), that separate SnO_2 agglomerates (away from the CNTs) were not seen. Instead, the SnO_2 nano-grains nucleate only on the surface of the CNTs. Finally, it can be observed that the CNT's walls and cavities are only vaguely visible in Figure 2 (a-c) which may be due to the interference of thicker oxide coatings that made it difficult to resolve the structures by TEM [10].

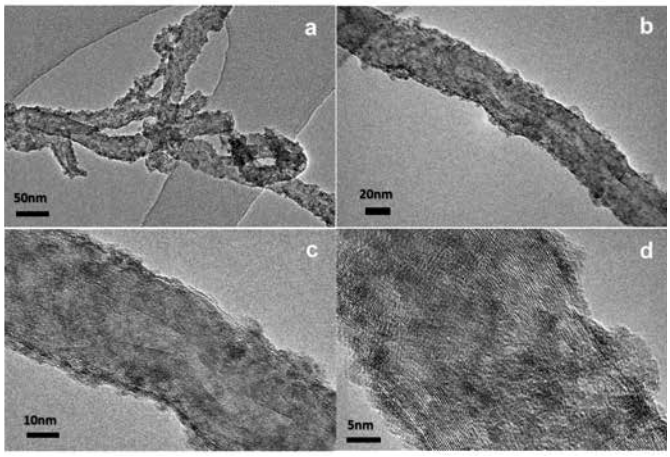


Figure 3. Closed-up examination of various other strands of the coated CNTs/SnO_2 60% w.t. nanocomposite; (a) tangled SnO_2 coated CNTs, (b) and (c) a mid-portion of the nanocomposite fibril coated with SnO_2 and (d) densely coated with nanocrystalline particles of SnO_2 on the surface of the CNT.

Figure 3 (a) shows more strands of CNTs coated uniformly with SnO_2 throughout. Figure 3 (b, c) present typical TEM images of mid portions of SnO_2 coated CNTs where the parallel and long fringes are from the CNT walls (the grapheme layers) are clearly distinguishable from those almost randomly originated from the nanocrystalline SnO_2. It should also be noted that the structure of the CNTs remain intact. No corrosion was observed in the deposition of SnO_2 onto the CNT as compared to that caused by the KMnO4 in the deposition of MnO_2 onto the CNTs. This can be clearly seen in the bundled nanocomposites in Figure 3 (a, b) and the long nanocomposite fibril in Figure 3 (b) as well as the deposition of SnO_2 at the very end of the CNT in Figure 3 (d). Such preservation of the CNTs' structure may be attributed to the fact that SnO_2 deposition resulted from the reaction between the Sn^{2+} ion and an oxidant, such as dissolved oxygen gas in the synthesis solution, without attacking the CNTs [15]. In Figure 3 (d), on the enlarged portion of one of the nanocomposite fibrils, the observed SnO_2 nanoparticles are rounded with diameters of about 4 nm and are distributed evenly on the surface of the CNT. These SnO_2 nanoparticulates also densely populate the CNT surface and show fringes on each of them, confirming nanocrystallinity.

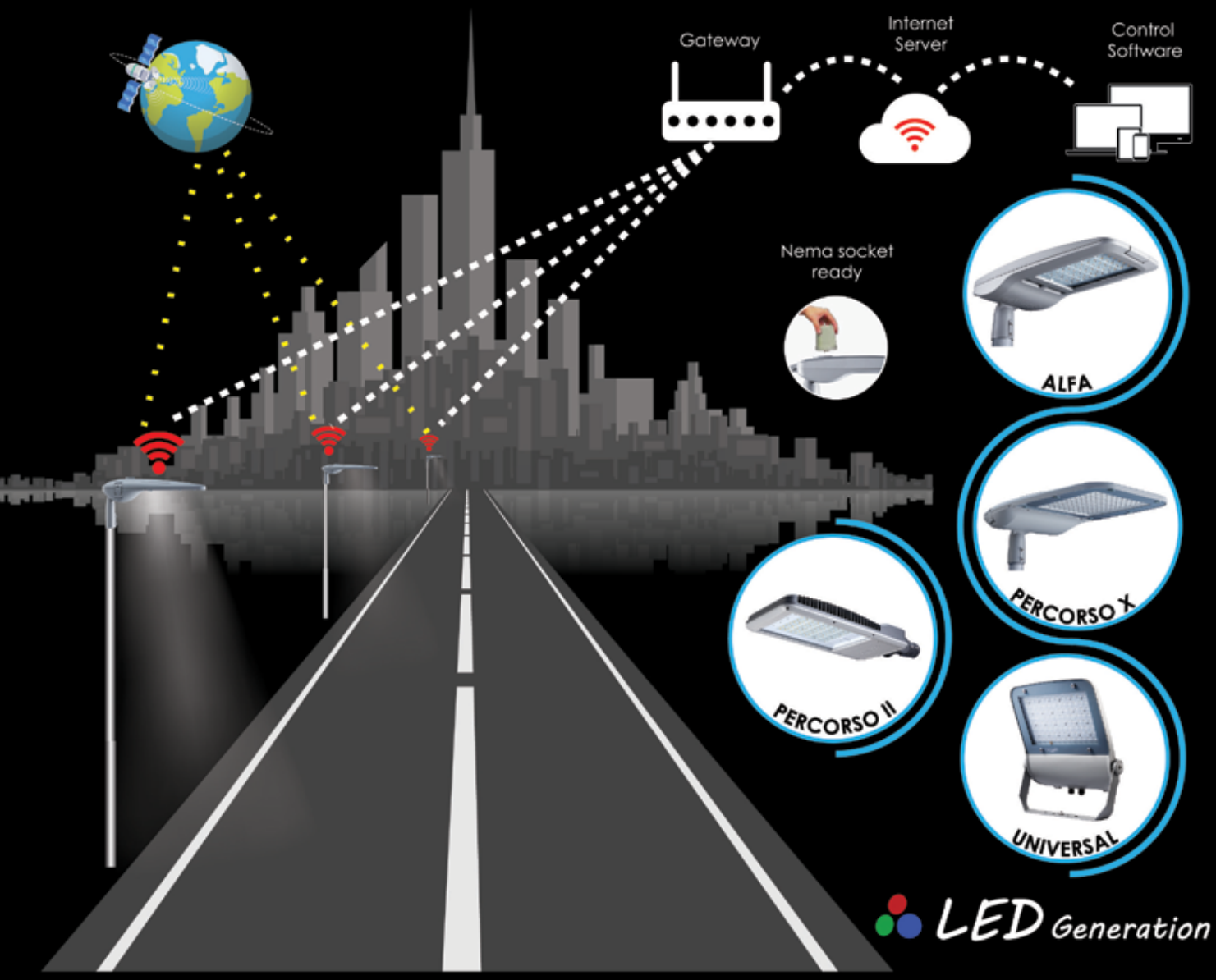
Figure 4 (a) shows the overview of the well-dispersed CNTs/MnO_2 60%w.t. nanocomposite on the carbon-holey grids examined under the TEM. In all the TEM images of the CNTs/MnO_2 60% w.t. nanocomposite, the surfaces of the CNTs are well covered with MnO_2 deposits. Figures 4 (c) and (d) depict uneven depositions of nano-layers of MnO_2 on the CNTs while (e) and (f), enlarged views, show that the CNT walls remained intact even with the presence of the thick layer of MnO_2 on the surface of the CNT. It was previously reported that the mechanism behind the deposition results in the formation of thick MnO_2 coatings on the CNTs [10, 11].

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In short, the growth of MnO_2 continues even after the surface of the CNTs are fully covered with MnO_2 deposit in accordance with the 'MEC' (microelectrochemical cell) principle, i.e. electrons are moved from the defect sites of the CNTs to other sites in contact with MnO_4 - where the anion is reduced to MnO_2 as in any electrodeposition process. Thus, the thick coating and no separated precipitation from the CNT structure is observed. Figures 4 (b) and (d) also show the broken and short-ended characteristics of the CNT, indicating that corrosion by $KMnO_4$ in the reduction to the insoluble MnO_2 might have taken place. The layered structure of the MnO_2 as can be seen in the enlarged TEM images of (e) and (f), would be excellent for retaining the facile transport pathways for both protons and electrons [16] as in the case of ruthenium dioxide, according to the following reaction (1) [11, 17-20]:

$$MnO_x(OH)_y + \delta H^+ + \delta^+ \rightleftharpoons MnO_{x-\delta}(OH)_{y+\delta} \quad (1)$$

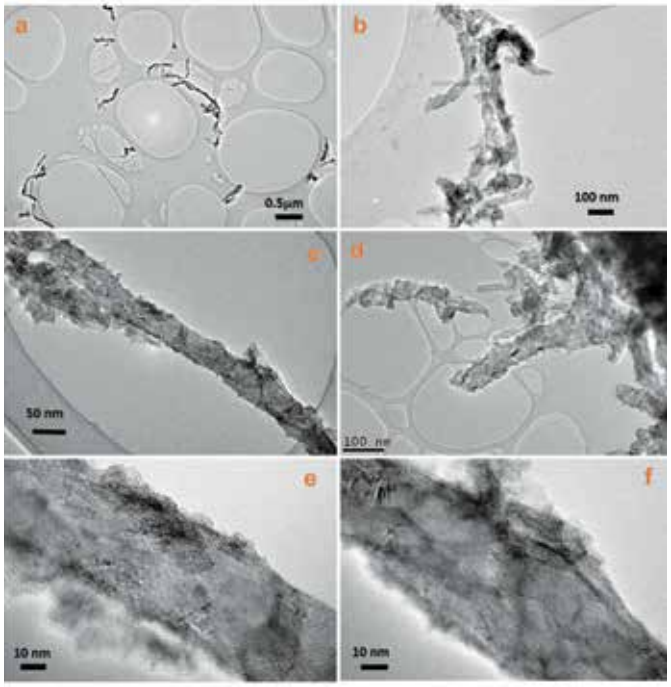


Figure 4. TEM images of the CNTs/MnO_2 60% w.t. nanocomposite.

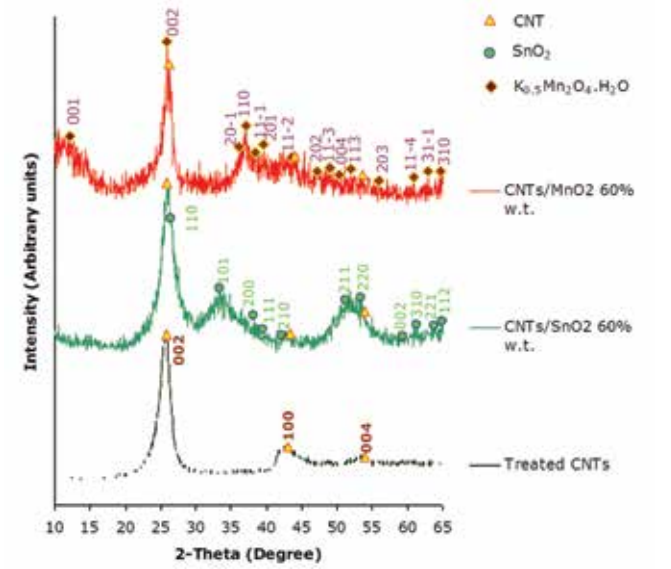


Figure 5. XRD spectrum of the nanocomposites and the acid-treated CNTs.

The XRD patterns of the nanocomposites reveal the presence of cassiterite-type SnO_2 (JCPDS 41-1445) in the CNTs/SnO_2 60% w.t. nanocomposite. The broad peaks are consistent with the nanoparticles being small (4 nm in diameter) as discussed in the TEM section before. The lattices are a = 4.738 Å, b = 4.738 Å and c = 3.187 Å. The peaks corresponding to the identification of the cassiterite-type SnO_2 are shown with the green round markers with their indexes. The XRD traces of the CNTs/MnO_2 60% w.t. nanocomposite show the peaks which correspond to monoclinic birnessite-type MnO_2 (JCPDS 42-1317) with lattices of a = 5.150 Å, b = 2.844 Å and c = 7.159 Å. There are three peaks from the acid-treated CNTs as indicated by the yellow triangular markers. The XRD patterns of the CNTs/SnO_2, CNTs/MnO_2, and acid-treated CNTs, are presented in Figure 5.

MnO_2 and CNTs are complementary in properties where the three-dimensional structure of their nanocomposite, due to the presence of CNT [21], provides the mesoporous cavity for ion movements.

MnO_2 is also known for its low cost and large pseudo-capacitance but has the disadvantage of being resistive [22]. Thus, a nano-layer of MnO_2 on CNT would improve the ion conduction in the MnO_2 phase [10]. The same improvement can be deduced for the CNTs/SnO_2 60% w.t. nanocomposite although SnO_2 is more conducting than MnO_2 (102 ~ 103 S/cm for SnO_2 vs. 10 ~ 102 S/cm for MnO_2) [23-24].

Sn has two stable valences, Sn(IV) and Sn(II), which is the basis for the redox chemistry of solid SnO_2. Thus, the charge storage mechanism for the transition metal oxides was applied to SnO_2 at positive potentials in a recent study [6]. However, no study has reported on using SnO_2 as the negative electrode in supercapacitors. To fill in this gap, the CNTs/SnO_2 nanocomposite was further studied by cyclic voltammetry at different potential ranges. The cyclic voltammogram recorded in a wide potential range, i.e. -0.8 to 0.9 V (vs. Ag/AgCl), is fairly rectangular in the overall shape, although a broad oxidation and reduction peak couple appears around 0.10 V. The peak currents varied linearly with the scan rates. These features are strong evidence of the same electrode reaction being responsible for the current flow in the tested potential range, which is in agreement with the behaviour of pseudo-capacitive materials.

When the potential range was narrowed to only positive or only negative potentials, the recorded cyclic voltammograms retained the respective partial features of the cyclic voltammogram recorded in the wide potential range. The capacitance values derived from the cyclic voltammograms in both positive and negative regions were very much the same, which again is evidence of the same electrode reaction being responsible for the pseudo-capacitance of SnO_2 in the wide potential range of 1.7 V as shown in Figure 6. It is worth pointing out that the cyclic voltammograms in Figure 6 suggest the possibility of using the CNTs/SnO_2 to make a symmetrical 1.7 V supercapacitor. However, because the specific capacitance of CNTs/SnO_2 is only about half of that of CNTs/MnO_2, it was decided to use the latter as positive electrode in the asymmetric supercapacitor.

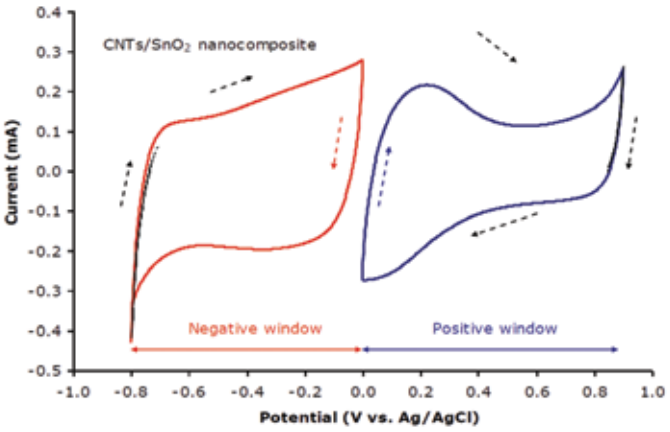


Figure 6. Cyclic voltammograms of the CNTs/SnO_2 in 2.0 M KCl recorded in different potential ranges.

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Summarising the relevant literature [5, 6] and the afore-mentioned findings from this work, the charge storage mechanism of the CNTs/SnO_2 nanocomposite can be expressed as equations (2), (3), and (4) below;

Oxidation:

$$Sn(IV)_{(x+y)}OOK_xH_y \rightarrow Sn(IV)O_2 + xK^+ + yH^+ + (x+y)e^- \quad (2)$$

Reduction:

$$Sn(IV)O_2 + xK^+ + yH^+ + (x+y)e^- \rightarrow Sn(IV)_{(x+y)}OOK_xH_y \quad (3)$$

Redox:

$$SnO_2 + xK+ + yH^+ + (x+y)e^- \rightleftharpoons SnOOK_xH_y \quad (4)$$

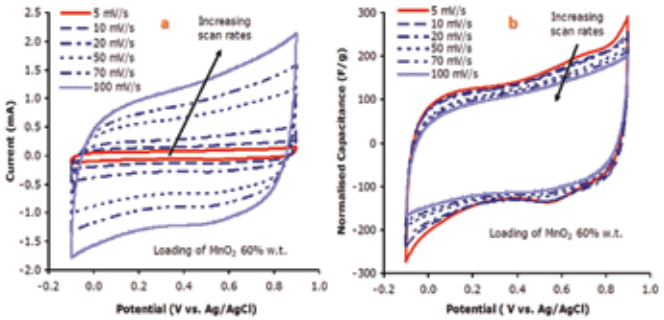


Figure 7. Cyclic voltammograms and mass-normalised capacitance vs. potential (vs. Ag/AgCl) of the CNTs/SnO_2 60% w.t. nanocomposite at various scan rates (5, 10, 20, 50, 70 and 100 mV/s) in 2.0 M KCl. Arrow indicates increasing scan rates.

Figure 7 shows the cyclic voltammograms of the CNTs/SnO_2 60% w.t. and its corresponding potential dependent normalised capacitance curves according to *C=I/s* The cyclic voltammograms are rectangular and relatively symmetric in current, which can be compared with an ideal capacitor. Besides this, the increase in the currents of the voltammograms with insignificant changes to their rectangular shapes with increasing scan rate also shows the good electrochemical properties of the nanocomposites and a high rate capability of charge-discharge of the nanocomposite. Figure 7 (b) depicts the increase in the mass specific capacitance which is calculated using equation *C=I/s* with respect to the decrease in scan rate and is in line with the slow response of the mass transfer process in fast scan rates, where ions have limited time to move in and out of the pores of the nanocomposites. It is also interesting to note that the negative ends of the potential windows of the cyclic voltammograms of the CNTs/SnO_2 nanocomposite at various scan rates reach a potential of -0.8 V (vs. Ag/AgCl). This is more negative than the current onset potential (ca. -0.5 V) for hydrogen evolution as observed on the cyclic voltammogram of a platinum electrode in the same aqueous electrolyte. This is indicative of over potential for hydrogen evolution on the CNTs/SnO_2 electrodes.

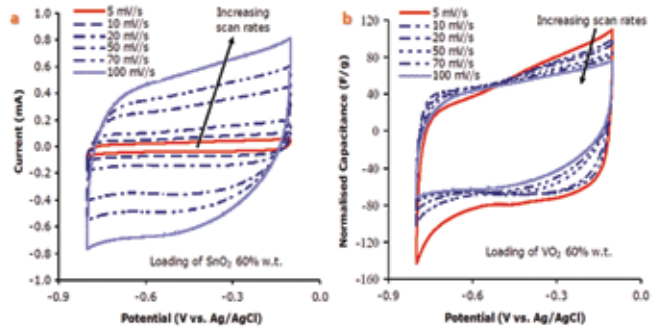


Figure 8. Cyclic voltammograms and mass-normalised capacitance vs. potential (vs. Ag/AgCl) of the CNTs/MnO_2 60% w.t. nanocomposite at various scan rates (5, 10, 20, 50, 70 and 100 mV/s) in 2.0 M KCl. Arrow indicates increasing scan rates. Mass of the CNTs/MnO_2 60% w.t. nanocomposite on the electrode: 0.10 mg.

Figure 8 shows the cyclic voltammograms and the corresponding potential-dependent normalised capacitance of the CNTs/MnO_2 60% w.t. nanocomposite at different scan rates. The arrows in the figures indicate the direction of the current change with increasing scan rate. The cyclic voltammograms grow larger with increasing scan rate. Even at a fast scan rate of 100 mV/s, the nanocomposite still shows a relatively rectangular cyclic voltammogram, indicating the high rate capability and high reversibility of the redox reaction of the MnO_2 deposited on the CNTs. The charge storage mechanism of the MnO_2 can be explained with reference to the widely accepted understanding of charge transfer reactions in solid transition metal oxides which are usually semiconductors.

The multiple valences of transition metals, e.g. Mn(IV), Mn(II) and Mn(II), are the thermodynamic reason for their ability to undergo electron transfer reactions. To maintain neutrality upon electron transfer into the solid oxide phase, intercalation and adsorption of either or both protons (H^+) and alkali cations (Li^+, Na^+, or K^+) from the electrolyte is necessary [11]. In the CNTs/MnO_2 60% w.t. electrode, both protons and alkali cations have been found to be involved in the redox transition between M(IV) and Mn(III) [11, 25, 26]. During the positive and negative potential sweeps, reversible oxidation and reduction reactions take place in the MnO_2, as explained below in the presence of the K^+ cations and H^+ protons from the 2.0 M KCl in equations (5), (6), and (7) below [11, 19, 27];

Oxidation:

$$Mn(III)_{(x+y)}Mn(IV)_{1-(x+y)}OOK_xH_y \rightarrow Mn(IVO_2 + {}_xK^+ + {}_yH^+ + (x+y)e^- \quad (5)$$

Reduction:

$$Mn(IV)O_2 + xK^+ + yH^+ + (x+y)e^- \rightarrow Mn(III)_{(x+y)}Mn(IV)_{1-(x+y)}OOK_xH_y \quad (6)$$

Redox:

$$MnO_2 + xK^+ + yH^+ + (x+y)e^- \rightleftharpoons MnOOK_xH_y \quad (7)$$

The variation in the mass specific capacitance of the CNTs/MnO_2 60% w.t. nanocomposite with the scan rate in the potential range of -0.1 to 0.9 V is shown in Figure 8 (b). At the lowest scan rate of 5 mV/s, the largest normalised capacitance plot is evident as compared to all the other scan rates. The specific capacitance decreases gradually with the increasing scan rate as can be seen. The decrease in specific capacitance was due to the incomplete mass transport process, thus, the incomplete redox reactions, adsorption/desorption, and intercalation/deintercalation of cations or protons in the higher scan rates. The highest average mass specific capacitance at the scan rate of 5 mV/s can be calculated also, utilising the average charge accumulated in the positive and negative sweep of the cyclic voltammogram and is found to be 138.20 F/g in the defined potential range of -0.1 to 0.9 V. A further examination of the electrochemical properties of the nanocomposite was carried out with the galvanostatic charge-discharge technique, and the results are presented in Figure 9.

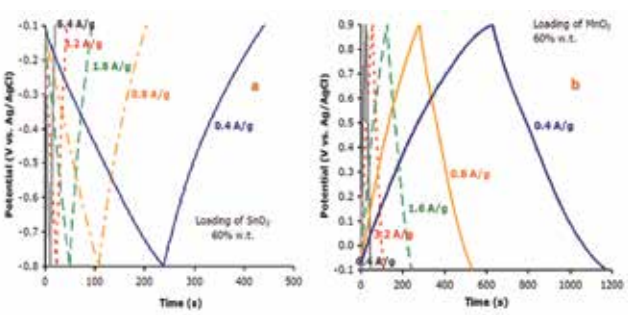


Figure 9. (a) Potential-time plots from the galvanostatic charge-discharge test of the CNTs/SnO_2 60% w.t. nanocomposites and (b) the CNTs/MnO_2 60% w.t. nanocomposites at different normalised currents (0.4, 0.8, 1.6, 3.2, and 6.4 A/g) in 2.0 M KCl.

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Figure 9 (a) shows the potential-time plots from the galvanostatic charge-discharge test of the CNTs/SnO_2 60% w.t. nanocomposites at different normalised currents of 0.4, 0.8, 1.6, 3.2 and 6.4 A/g. The potential-time plot of CNTs/SnO_2 60% w.t. is compared with that of CNTs/VO_2 60% w.t. and the acid-treated CNTs at the normalised current of 0.4 A/g. At the lowest normalised current applied, i.e. 0.4 A/g, a specific capacitance of 130.19 F/g is obtained for the range of -0.8 to -0.1 V against Ag/AgCl. Given that at the same normalised current and potential range, acid-treated CNTs recorded a specific capacitance of 35.11 F/g in the negative range, the specific capacitance of the SnO_2, CM-oxide, assuming proportional contribution can be found to be 193.57 F/g. The potential-time plots from the galvanostatic charge-discharge test of the CNTs/MnO_2 60% w.t. nanocomposite in the Figure 9 (b) show linear variation of the potential with respect to time in the potential range of -0.1 to 0.9 V (vs. Ag/AgCl), indicating good capacitive behaviour for all the normalised currents applied, i.e., 0.4, 0.8, 1.6, 3.2 and 6.4 A/g. Even at a higher normalised current of 6.4 A/g, a specific capacitance of 162.00 F/g was recorded for the CNTs/MnO_2 60% w.t. nanocomposite. At the lowest normalised current of 0.4 A/g, the CNTs/MnO_2 60% w.t. nanocomposite registered a capacitance of 236.62 F/g, while the acid- treated CNTs recorded a specific capacitance of 41.21 F/g in the positive range. Assuming proportional contribution, the specific capacitance of the MnO_2, CM-oxide can be determined to be 366.89 F/g.

4.0 Electric/Hybrid Car: A Supercapacitor Case Study

The supercapacitor device can be used to successfully improve the performance of an electric or hybrid vehicle, or other device requiring bursts of power much larger than its steady-state requirement. If we assume the application requires steady-state power of 7.2 kW for 10 hours, with occasional peak power of 80 kW for a few seconds to tens of minutes at a time, we can use the data presented in Figure 1 to determine how this supercapacitor technology would be of benefit. In a first case scenario, we assume that the vehicle is powered solely by Li-ion batteries, with energy density of 100 Wh/kg and power density of 0.1 kW/kg. Here, the total energy requirement of 72 kWh requires 720 kg of Li-ion batteries. These batteries can provide 72 kW of power at maximum, thus not meeting the burst requirement of 80 kW of the occasional peak power which may also cause the over-discharging of the Li-ion batteries, if stretched. To achieve the required peak power, the Li-ion batteries would need to be sized-up with an extra 80 kg. By combining Li-ion batteries of 720 kg and 0.8 kg of supercapacitor however would allow this peak power requirement to be met, thus a savings of 79.2 kg of the total weight of the energy storage.

In a second case scenario, we assume that the electric vehicle is powered by Ni-Cd batteries, with energy density of 70 Wh/kg and power density of 0.06 kW/kg. Here, the total energy requirement of 72 kWh can be supplied by 1,029 kg of batteries. These batteries are capable of providing 61.7 kW at maximum power, which is less than the maximum power requirement. To achieve maximum power of 80 kW, the vehicle would actually need to carry 1,334 kg of Ni-Cd batteries, or an extra load of 305 kg. This extra power of 10.3 kW could alternately be supplied by a 2 kg supercapacitor, for burst times of a few seconds to tens of minutes. Similar performance benefits would be obtained when fuel cells replace batteries as the primary power source, as the energy density is higher and power density is lower for fuel cells. In this case, the supercapacitor could provide burst power with less mass than Li- ion batteries.

5.0 Conclusion

CNTs/SnO_2 60% w.t. and CNTs/MnO_2 60% w.t. have been successfully synthesised via hydro-oxidation deposition of SnO_2 on the CNTs and reduction of KMnO4 by CNTs, i.e., redox and deposition, respectively. The SEM images for the CNTs/SnO_2 revealed jagged surface morphology while the TEM images confirmed the evenly distributed SnO_2 nanoparticulates on the surface of the CNTs throughout the structure. TEM images validated the existence of uneven coatings MnO_2 on the surface of the CNTs. XRD patterns reveal the presence of SnO_2 (JCPDS 41-1445) and birnessite-MnO_2 (JCPDS 42-1317) in the CNTs/SnO_2 and CNTs/MnO_2 nanocomposites, respectively. CNTs/SnO_2 exhibited an over-potential for hydrogen evolution as no gas evolution was observed for a potential as negative as -0.8 V (vs. Ag/AgCl) while the CNTs/MnO_2 showed an oxygen over-potential on the positive range extending above the potential of the evolution of oxygen at 0.6 V (vs. Ag/AgCl). The maximum values of mass specific capacitance achieved by the CNTs/SnO_2 60% w.t. and the CNTs/MnO_2 60% w.t. were 130.19 F/g and 236.62 F/g respectively, at the normalised current of 0.4 A/g. These values correspond to the specific capacitance (CM-oxide) of (assuming proportional contribution) 193.57 and 366.89 F/g for SnO_2 and MnO_2 respectively. The knowledge of the capacitance achievable by these nanocomposite materials can be utilised to build desirable supercapacitors of any sizes to be used in the UPS back-up system or possibly replacing diesel standby generators in the case of blackout. Thus, the results reported in this article on these nanocomposite materials show that they are capable of constructing the next generation supercapacitors which is crucial as we face the energy crisis in the present and in the future and when the engineering world needs more efficient, yet environmental-friendly, energy storage devices.

6.0 References

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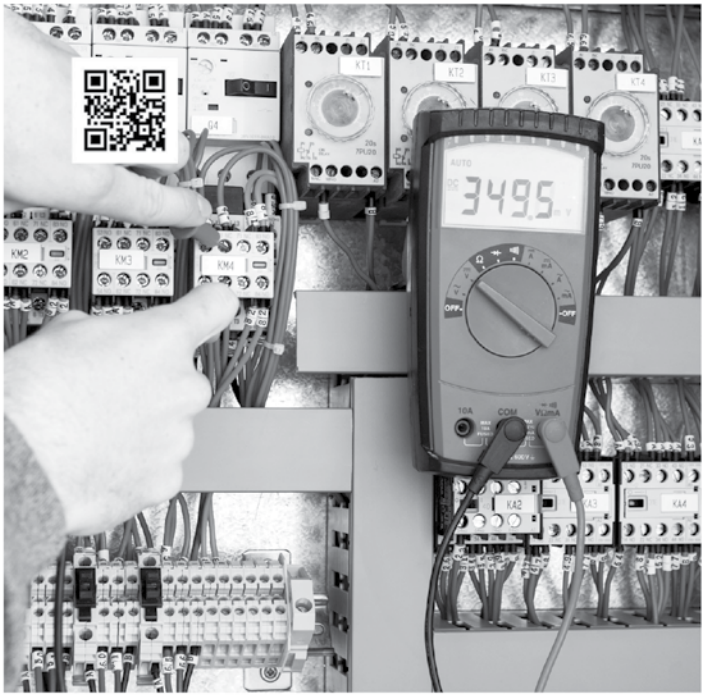


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Ir Dr Ng is a Chartered Engineer with the Engineering Council (UK) and a Professional Engineer with Practicing Certificate (Electrical) registered with the Board of Engineers, Malaysia. He is a Corporate Member of the Institution of Engineering and Technology (UK); Corporate Engineer with the Institution of Engineers, Malaysia (IEM); Professional Member of Green Building Confederation; Industrial Board Member of the Heriot Watt University, Malaysia Campus; Industrial Board Member of the Nottingham University, Malaysia Campus; EXCO Member of University of Western Australia Graduate Association; and Chairman of Consulting Engineers Special Interest Group 2017/2018 of IEM. He is a Member of the Drafting Committee for Energy Efficiency & Conservation Act under the Ministry of Energy, Science, Technology, Environment & Climate Change, Malaysia.

Ir Dr Ng is a Council Member of The Electrical and Electronics Association of Malaysia (TEEAM) for the term 2017-2019. He is a Director at MyBIG Sdn Bhd /Leong Hing Electrical Engineering Sdn Bhd. He can be contacted at E-Mail: kokchiang.ng@leonghing.com





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Solar Panel Market in Netherlands

This article is prepared by MATRADE

With a luring EUR 12 billion subsidy programme for Renewable Energy (RE) and more solar parks being built at a larger scale, the Dutch Photo-Voltaic (PV) market stands at the verge of a strong boost in the coming years. Experts predict the total PV capacity to increase from the current 2+ Gigawatts to 20 Gigawatts in 2027. Foreign contractors and investors are eager to enter the market.

Market Trend

The SDE+ (in Dutch: Stimulering Duurzame Energieproductie) is an operating Grant. Producers receive financial compensation for the RE they generate. Production of RE is not always profitable because the cost price of RE is higher than the market price. The difference in price is called the unprofitable component. SDE+ compensates producers for this unprofitable component, for a fixed number of years, depending on the technology used. The Dutch Government expanded its SDE+ subsidy budget, making the country one of the most attractive PV markets for investors in Europe. Both contractors and developers who are specialised in building solar parks, finance companies, and investors who want to buy and exploit turnkey built parks, sometimes join forces with Dutch partners or start daughter companies. With their corporate approach, they are developing larger scale solar parks.

An interesting development in the PV industry is that a Dutch Consortium announced that it has plans for the world's first "off-shore" floating PV plant for the North Sea. The pilot project will be developed over the next three years and will utilise standard PV modules. While the number of floating PV projects announced across the globe is constantly increasing, the figures for projects of this kind emerging from the Netherlands are booming significantly.

The latest floating-solar head-turner comes from a Consortium formed by a local Research Institute, namely, the Energy Research Centre of the Netherlands (ECN), the Netherlands Organisation for applied scientific research (TNO), the Maritime Research Institute Netherlands (MARIN), the Abu Dhabi National Energy Company, PJSC (TAQA), and the Dutch start-up specializing in the development of floating systems for Renewable Energy at sea, called Oceans of Energy, which claims that it will conceive and deploy what it calls the world's first floating PV array at sea.

The Consortium believes that the solar array may even have a 15% higher yield compared to traditional PV systems. ECN, which will select the solar modules for the projects, said that the installation will rely on standard modules used in PV projects built on land. The Consortium stressed that this technology may be particularly utilised at existing off-shore wind power parks, taking advantage of the calmer water surface between the wind turbines and the existing connection lines with power networks.

Conclusion

These new developments in the Dutch solar panels' market will create opportunities for innovative Malaysian PV panels suppliers. Therefore, Malaysian companies should focus on the usability of their products by showing the Dutch project officers (such as ECN) on the products' suitability for the Dutch innovative projects. This can be done by working together with Research Centres such as TNO and the University of Utrecht.

It is possible that the first production may be produced in the Netherlands in a small quantity as a pilot, but eventually the production could be outsourced to other countries like Malaysia where the production cost is much lower. This creates opportunities for Malaysian solar panel companies.

For more information, please contact MATRADE Rotterdam at rotterdam@matrade.gov.my

Disclaimer

While every effort has been taken to ensure that the contents of the article are accurate and current, MATRADE cannot be held responsible for any inclusion, omission or error and is not liable for any loss or dispute arising from the use of the information provided.

Wire & Cable Vietnam 2018

The 2018 Wire & Cable Vietnam exhibition was held from 30th October to 1st November 2018 at the ICE Hanoi. Organised by the Century Expo Group (CEG) and supported by TEEAM and the Malaysia Cable Manufacturers Association (MCMA), it was an international exhibition focusing on Wires and Cables; Electric Equipment and Machinery; and Cable Accessories.

There was participation from about 100 businesses from Vietnam and ten other countries, including members of TEEAM and MCMA. With its rapid economic growth and socio-political stability, Vietnam has become an attractive market for foreign businesses, with modern production chains, outstanding industrial products and tools. The exhibition provided a good platform to explore the Vietnamese market. The 3-day event drew a good crowd from the local businesses and foreign visitors.



New Members

The following new members have been approved and accepted by the TEEAM Council (as at 21st November 2018). A warm welcome to all the new members and special appreciation is extended to those who introduced these new members. For those who are not yet members…… why wait? Join us and find out how our Association can offer our value-added services to you and your highly esteemed Companies!

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Challenges and Opportunities in the Electrical Industry – Part 33

By Ir Chew Shee Fuee KMN, TEEAM Immediate Past President

MESTECC povided an update on the new Net Energy Metering (NEM) & policy on new Solar PV business behind-the-meter

As we have known that Feed-In-Tariff (FIT) days are over and the Solar Photovoltaic (PV) business started to take a tumble. The newly elected Minister has however provided a ray of hope in restoring the Solar PV opportunities.

"The Government intends to provide sustainable, reliable and affordable solar energy for Malaysians through new policies commencing 1st January 2019," said the Honourable Yeo Bee Yin, Minister of Energy, Science, Technology, Environment and Climate Change (MESTECC).

The new policies, the new Net Energy Metering (NEM) scheme and Supply Agreement for Renewable Energy (SARE) which were announced recently at IGEM 2018, were introduced to create a fertile ground to grow the solar industry by opening the market and subsequently move the local players to become regional solutions providers.

Effective 1st January 2019, the new NEM scheme will be improved from the net billing concept to the pure net energy metering scheme. This will help improve the return of investment of solar PV under the NEM scheme. Under the existing net billing scheme, excess electricity is sold to TNB at a displaced cost (31 cents per kWh) but under the new scheme, monthly electricity bill will be consumption (from TNB) minus generation (from solar) multiplied with retail electricity tariff. This will result in additional electricity savings per month and will help in return of investment in solar PV system.

The proposal is certainly welcomed by everyone and will help the country to increase the RE production.

The quota allocation for NEM is 500 MWac up to 2020. Quota allocation will be divided into domestic and non-domestic categories.

The launching of NEM Calculator website.

To enhance NEM understanding among the general public, SEDA supported MAQO Solar Malaysia's initiatives to launch the NEM Online Calculator to allow the public and investors to calculate the solar PV investments in terms of electricity bill savings. This estimation technology is made available using their rooftop size identifiable via the Google Map.
http://www.maqosolar.com/solar-calculator/

Energy Efficiency Low Carbon Building Programme



Ir Chew Shee Fuee KMN

Sustainable energy will require both Renewable Energy (RE) and Energy Efficiency (EE) to work in synergy. Each unit of electricity that is efficiently used will mean less electricity is needed to be generated in order to replace any wastage. SEDA champions the drive for Low Carbon Building and has introduced measures to improve energy efficiency of buildings. Additionally, SEDA supports MESTECC in drafting the new Energy Efficiency and Conservation Act (EECA) which is expected to be gazetted by the end of 2019.

EECA will assist the implementation of EE in a more comprehensive manner.

Ir Chew Shee Fuee KMN *B Sc (Hons) (Strathclyde), PEng, CEng, FIEM, MIEE Member, IEEE Member, 1st Grade Electrical Engineer (Competent up to 500 kV).*

Ir Chew was President of The Electrical and Electronics Association of Malaysia (TEEAM) for 2001-2005 and 2013-2017. He is the President of the ASEAN Federation of Electrical Engineering Contractors (AFEEC) for 2016-2018. He is the Chairman of The Institution of Engineering & Technology (IET) Malaysia Local Network. Ir Chew is the Managing Director of G H Liew Engineering (1990) Sdn Bhd and Chris Chew Electrical Consultant. He graduated from the University of Strathclyde, Glasgow with a B Sc (Hons) in Electrical & Electronics Engineering. He is a Professional Engineer and is also licensed by the Energy Commission as a Competent Engineer (without voltage limits) and a Service Engineer to carry out electrical testing up to a voltage of 500 kV.

Ir Chew has more than 30 years of industry experience in electrical control and relay protection. He is also specialized in electrical site tests on power equipment, electrical fault investigation, service and maintenance of electrical switchgears and relays. His work also includes electrical supervision of sub-stations and electrical audit. He also presents lectures on electrical apparatus and the protection system. He was Vice-Chairman of MyENC (Malaysian Electro-Technical National Committee) and is a Member of Technical Committees (TCs) and Working Groups (WGs) in Standards Development. He can be reached at E-mail: sfchew@ghliew1990.com.

Membership Recruitment Campaign

TEEAM appeals to members to help in recruiting companies and individuals to join the association to strengthen TEEAM's membership base. Incentives are offered by the Membership Recruitment Committee. Members introducing a company member will be entitled for two points, while introducing an individual member will be entitled for one point. The points can be accumulated and used to redeem free advertisements in Suara TEEAM or redeem membership subscription.

For details, please contact the TEEAM Secretariat at Tel: +603-9221 4417. The membership application form can be downloaded from the TEEAM website at www.teeam.org.my.

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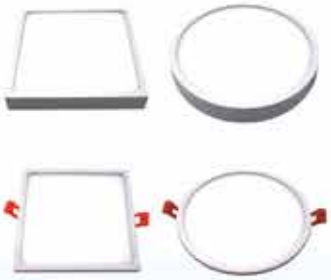
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T5 LED INTEGRATED



T8 LED LOUVER FITTING
T8 LED ANTICRROSIVE FITTING
T8 LED FITTING

HIPSON™



56" CEILING FAN













60" CEILING FAN





EXHAUST FAN



INDUSTRIAL FAN

MS
SIRIM

Plugs, Socket-Outlets for Industrial Purposes

LS – TYPE Plugs and Socket-Outlets for Entertainment


Plugs


Couplers

Inclined flush mounting sockets - Watertight IP67


PEW...PI 16A-32A 63A-125A

Couplers - Watertight IP66/IP67


16A-32A

Wall-mounting plugs - Watertight IP67


PEW...SM 63A

Plugs – Watertight IP66/IP67


PEW...SV 16A – 32A

Interlocked switched socket-outlets with screw type fuse carrier aluminium enclosure – splashproof IP55


(PK...PB5 125A)

Interlocked Switched Socket-Outlets


TM...SP

Plugs - Low voltage from 50V to 690V

IP44


PE...PP 16A-32A


PE...PQ 16A-32A


PE...SV 16A-32A

IP67


Couplers 16A-32A


SIPW...SV


PEW...PP 16A-32A

Multipole Connectors for Industrial Purposes

C-Type



IP Enclosure C-Type


Hoods with 2 levels


Hoods with 1 level

CNE-CSE 16 Poles


Inserts, Screw terminal connection

MIXO modular units


4 poles 40A-830V

CT – CTS 64 Poles


Terminal blocks inserts screw terminal connection

CP 6 Poles 35A-400/690V


Inserts, screw terminal connection

CKS 3 and 4 Poles


Inserts, 3 poles + connection with spring terminal


Inserts, 4 poles + connection with spring terminal

CMCE 3+2 (aux) polest


Inserts, Crimp Connections

MIXO modular units 2 poles 100A


Crimp connections

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