

IET SRI LANKA NETWORK

NEWSLETTER

JUNE 2020

The Contribution of Engineers During COVID-19



The Institution of
Engineering and Technology



Dear Readers,

The Institution of Engineering and Technology (IET) – Sri Lanka Network is working to engineer a better world. The IET, (formerly known as the Institution of Electrical Engineers – IEE), is one of the world's largest engineering institutions with over 167,000 members in 150 countries. Having established in way back as 1871, IET is one of the oldest engineering institutions in the world. Today, our mission is to inspire, inform and influence the global engineering community, supporting technology innovations to meet the needs of society. It is also the most multidisciplinary Institute – reflecting the increasingly diverse nature of engineering in the 21st century, and I am proud to address you as the IET Sri Lanka Network Chairman for the 2020/2021 session in this edition of the newsletter.

To continue with the successful events and programs organized by the IET Sri Lanka Network in the past, this year too, our committee has focused on delivering high-quality, professional and stimulating events for all our members, which will enhance the Engineering knowledge and provide a networking platform for all engineering professions across Sri Lanka.

IET Sri Lanka Network is very active in organizing evening forums every month on timely topics related to engineering and technology. Industry specialists and relevant resource personnel are invited to these forums. This year, we are planning to conduct evening forums on "3D Technology – 4th Industrial Revolution", "Colombo Port City project", "Vessel Management System project", "Public Safety Communications & Smart City", "Awareness on International Professional Registration with EC UK", and "IET Wiring Regulations" and a couple of site visits.

However, with the spread of the COVID-19 virus which is the most serious global health security threat in decades, we will have to re-plan our activities. As a major step, we will have to suspend all physical IET Local Network activities at least till end of June. Thus, we are now compelled to do our activities on virtual means including the IET Sri Lanka Network Executive Committee monthly meetings using online meeting tools. Until the situation is normalized, we will have to explore Webinars and other online options to conduct evening forums for our members. Our Young Professionals (YP) section will also continue to liaise with their counter part On Campus groups using virtual means.

Under circumstances, Present Around the World (PATW) Competition will not take place in 2020 but our YP will plan to conduct their Technical conference for which all planning work which can be conducted online will be attended until June. Our main committee will continue planning and online activities for the Annual Technical Conference (ATC) and International Conference as well.

If you are not a member of the IET, I encourage you to obtain the membership of IET and be a part of the world's most eminent knowledge sharing network for professionals in engineering and technology. Further, I would like to request all of you to connect with us in the upcoming events, technical forums and conferences organized by IET Sri Lanka Network, to make the Sri Lanka Network a success.

Finally, let me thank Major Buddika Herath and his team for editing this newsletter.

Dr. (Eng.) Lalith Liyanage

PhD (Northumbria/UK), MBA (Moratuwa/SL), MSc (Essex/UK),
PG Dip (IIPM/India), MSc (Donetsk/USSR), BSc (Donetsk/USSR),
CEng, FIET, MIESL, MBCS, MCSSL, CMISMM, ASMD(IOC)

IET Sri Lanka Network Chairman – 2020/21

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THE CONTRIBUTION OF ENGINEERS DURING COVID - 19

Manufacturing of Surgical Kits, Masks and Manual Mask Making Machines

Micro Power Engineering (Pvt.) Ltd, Sri Lanka

Micro Power Engineering (Pvt.) Ltd, Piliyandala, Sri Lanka was founded in the year 1995 and from the inception the company is focused to the attention of protecting Man & Environment in the business activities.

Eng. Leyart Silva, the Managing Director of Micro Power Engineering (Pvt.) Ltd is a Fellow member of IET and he managed to use the time of lock-down in a positive manner in fighting against the pandemic.

He could collect PPE polythene and other raw materials despite the tight security and restrictions, however, in a diplomatic as well as protective manner to make surgical kits, Mask and Mask Making Manual Machine with the limited available resources. A couple of Hospitals and Army Entities have also supported him and the company staff in order to obtain the legal travelling permits.



Infrared Thermometers presented to MOH Bokundara.



Donations to Mawanalla, Colombo General and Kalubowila hospitals.



Three Layer Mask Machine (Manual).



Personal Protection Equipments.



Donations to Army camps in Kandy and Wallipanna.



The contribution of children.

Restoring Ventilators Amidst of COVID19 Pandemic

Department of Electrical and Electronic Engineering, Faculty of Engineering, University of Peradeniya

When the first COVID19 victim was found in Sri Lanka, there were only 543 ventilators working all over the country dedicated for other work than COVID19 patients. By that time, there has been a huge demand for ventilators all over the world, as the respiratory support was one of the critical recommendations for COVID19 patients by the medical experts. Therefore almost all ventilator suppliers were busy with supplying high volume customers and countries like Sri Lanka had a little chance of getting the orders on time. As a result, various tech savvy groups around the country started working on new ventilators. Having studied the development cycle time of a standard complied medical grade ventilator, we at the Department of Electrical and Electronic Engineering (DEEE), Faculty of Engineering, University of Peradeniya, in addition to designing and developing a new ventilator, offered our technical knowhow, skills, resources and time to repair and restore malfunctioning or already condemned ventilators around the country. The Institute of Engineers Sri Lanka (IESL), Ceylon Oxygen Pvt., Ltd., LTL Holdings Pvt., Ltd., as well as alumnus of the batches E/94, E/04, E/05 and E/10 came forward to contribute this voluntary activity by helping to find various components and spare parts for repairs in a completely lock-down environment while providing the necessary funds to purchase the same.

The Biomedical Engineering group at the DEEE in collaboration with the Faculty of Medicine and the Teaching Hospital Peradeniya, shared knowledge and trained the staff on the ventilation and ventilators prior to starting the restoration work. A few sleepless hard working nights of a dedicated team of academic staff, non academic staff, instructors, research engineers, voluntary alumni group from E/04 and E/05 batches managed to restore 10 ventilators in a week and by the end of this month, they hope to restore 25, whose financial saving to the government will be over Rs. 100 million.

The restored ventilators were certified by the ministry for their correct performance prior to returning them back to service. The ventilators were brought for restoration from the Teaching Hospitals Peradeniya and Anuradhapura, District General Hospital Matara, Base Hospital Vavunia, Mathale, Gampola, Dehiatthakandiya and Nikaweratiya.

The first set of restored ventilators were handed over to the Ministry of Health on the 11th April when Dr. Amal Harsha De Silva / Deputy Director General – Medical Services visited the team and the restoration lab at the DEEE.



Team members repairing the ventilators.



First set of ventilators to be handed over to the Ministry of Health.



Official handing over of the first lot of restored ventilators by the Vice Chancellor Prof. Upul B. Dissanayake to Dr. Amal Harsha De Silva, Deputy Director General – Medical Services.



Team members of ventilator restoration team.

Ceylon Electricity Board Engineers Union Supports the Government and Health Sector to Improve the Facilities to Combat Covid-19 Pandemic

Ceylon Electricity Board Engineers Union (CEBEU), the major trade union of the Ceylon Electricity Board (CEB) took part in the battle, supporting the government and health sector to combat Covid-19 pandemic by donating a sum of 4.6 Million LKR.

As the first step, 1.1 Million LKR worth donation was done to the Panadura Base Hospital including three ICU beds and three multi parameter monitors. The equipment were handed over to Dr. Indrani Godakanda by the President of the Ceylon Electricity Board Engineers Union Eng. Anuruddha Tilakaratne. Additional General Manager Eng. Rohan Senevirathna and representatives of CEBEU participated for this event. Further CEBEU donated 700,000 LKR to General Hospital of Kaluthara (Nagoda) for the material for constructions of special partitioned ward which will be used to accommodate suspicious Covid-19 infected patients. The Union also donated 3000 meters of Two-tone Taffeta Fabric for the use of making personal protective kits to be used in Sri Lanka Army.

Additionally, CEBEU donated 2.5 Million LKR to the "COVID – 19 Healthcare and Social Security Fund" which was set up by His Excellency the President Gotabhaya Rajapaksha to strengthen the mitigation activities for controlling the spread of COVID-19 virus in the country.

The Engineers with other staff of Ceylon Electricity Board carrying out a tremendous service at this critical moment to maintain uninterrupted power supply to the country, while following healthcare instructions to ensure the safety of the staff of Ceylon Electricity Board.



Donations took place at Panadura Base Hospital.



Donated 700,000 LKR to General Hospital of Kaluthara (Nagoda).



The Union donated 3000 meters of Two-tone Taffeta Fabric for the use of making personal protective kits to be used in Sri Lanka Army.

COVENT- DIY

By Dr. Jeewaka Dayarathne, Eng Sajitha Dassanayake & Eng. Udana Thiranagama

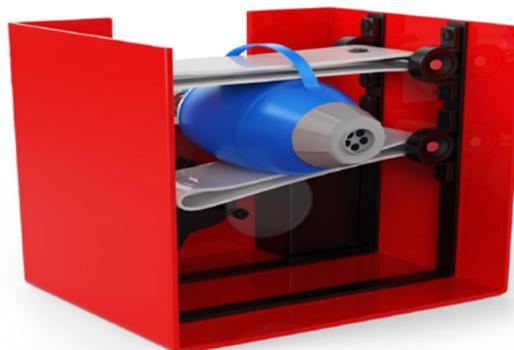
There are limited high-performance ventilators in the world to simultaneously treat many severe Covid-19 cases. Huge bottlenecks could arise if the measures now taken do not work and a high number of serious cases of illness occur. A simple ventilator developed by a three man team consists of Dr Jeewaka Dayarathne, Eng. Sajitha Dassanayake and Eng. Udana Thiranagama can be used to compensate for the lack of ventilators in the corona pandemic.



This DIY type ventilator is named COVENT-DIY. Unlike a traditional mechanical ventilator, the COVENT-DIY does not require pressurized oxygen. The device consists of a frame and a mechanical actuator that compresses a traditional ambulatory ventilation bag (aka Ambu bag or bag valve mask), which is connected to the patient's airway and is used to pump either external compressed oxygen or ambient air.



What sets COVENT-DIY concept apart from all the other solutions is that it gives a ventilator that is quick to build out of materials that are widely readily available. There are no 3D printed parts or fancy materials used in this so anyone with basic woodworking and soldering skills could put this device together in their workplace.



It was designed to be medical grade and also inexpensive enough to be considered disposable by hospitals. The prototype uses the simplest type of motor controller circuit, a windshield wiper motor and a simple cam system. A final version will likely include additional custom made parts to add i/e pressure controls and to reduce contamination. The final product won't cost more than Rs. 15,000.00 to build it from scratch.

The device can be calibrated as such that it allows users to adjust the rate of air delivery, the air volume to the lungs of patients depending on their conditions and most importantly control the expiratory pressures which is vital for a lung which has been effected by acute pneumonia. Most of the critical cases of COVID-19 will suffer from this severe acute respiratory syndrome.

In conclusion, the device can be built from a simple DIY work by hospital team. Controls of the COVENT-DIY are simple and can be operated by any healthcare worker with minimal training.

As the next step the team is working on a cheap DIY kit which can be sent out to hospitals. That way any hospital can develop a high grade, high quality and trustworthy alternative ventilator.



Dr. Jeewaka

Eng. Sajitha

Eng. Udana

Ventilators from Variosystems

Variosystems is a contract manufacturer for Printed Circuit Board Assemblies (PCBA) and Wire Harnesses. In both industries, the scope of production extends from prototypes to mass production. It was founded by 3 dynamic partners in 1993 - Switzerland and came into this beautiful island by 1998. Serving its customers around the globe by locating 5 countries namely Switzerland, USA, Sri Lanka, China and Croatia; all sites are networked via SAP – ERP system.

Variosystems Lk in Badalgama Has provided employment opportunity to 1060 people in a state of the art manufacturing facility.

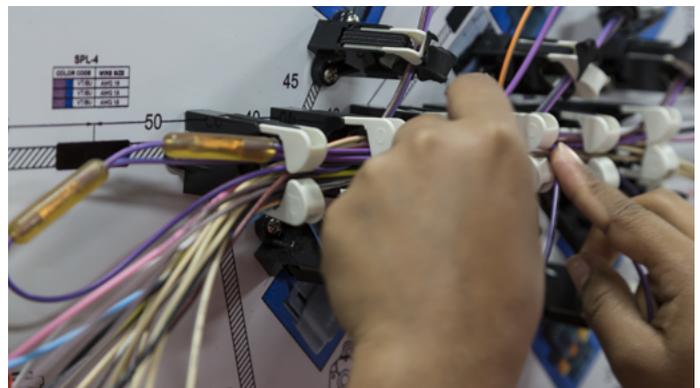
The company has been engaged in producing electronic circuits for ventilators and other medical equipment for many years. Due to Corona virus the worldwide demand for medical equipment have escalated rapidly. But Variosystems Lk had to halt the production for weeks due to curfew imposed within the country. However under critical circumstances our Managing Director T. Satheeswaran made the decision to commence production with minimum number of employees. It is not with the intention of earning profits but to be responsible for saving thousands of lives from COVID-19 pandemic. Relevant approvals in place and required precautionary measures taken to the highest standard in order to ensure employees health & safety.

There is a group of known heroes amongst us – task force, doctors, nurses and all health sector workers fighting to save lives of those infected. Various resources required for this battle and ventilators are one of the most important in treating patients in critical condition. Being a social responsible company, Variosystems Lk believes it's their duty to support and contribute to the efforts of Government of Sri Lanka to combat Covid-19 in Sri Lanka. Employees of variosystems have the opportunity to be a part of this combat. By taking the risk they are coming to the factory and Though they are not the front line, aren't they also heroes ?.

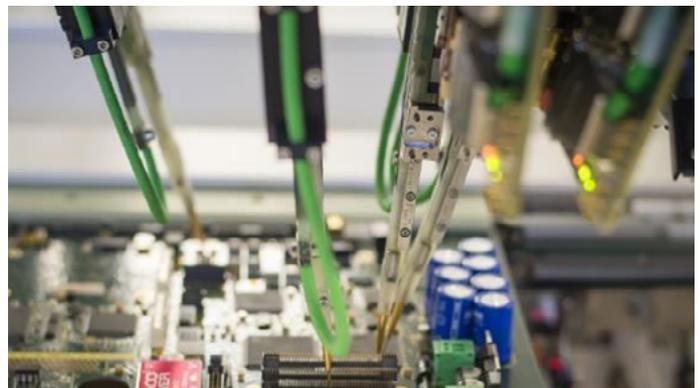
Going beyond the job, Variosystems Lk contributed for a massive donation to the country. Following medical equipment worth of total 12 Mn LKR, were hand over to the Government of Sri Lanka by Variosystems on 04.05.2020 at the President Secretariat office. Fund supported through company, voluntarily donated employees' salary and few of our customers. This will help country to be back in new normality soon.



Cleaning process.



Wire Harness of the ventilators.



Wave soldering process.



Donation took place at President Secretariat office.

IN THE SPOTLIGHT

IET Young Professionals Interactive Session with IET President Dr. Peter Bonfield

IET Young Professionals Interactive Session to welcome IET President Dr. Peter Bonfield to IET Young Professionals Sri Lanka Network was glamorously held on 9th of October 2019 from 2.30 pm onwards at Wimalasurendra Auditorium in IESL premises, Colombo 7. IET student members from IET On Campuses University of Moratuwa, University of Peradeniya, University of Ruhuna and SLIIT participated for this event and presented throwback of events conducted by each On Campus.

IET President Dr. Peter Bonfield addressed the gathering and shared his experience and importance of being an IET member. Interactive session was conducted with the participation of IET President, Dr. Peter Bonfield, IET Country head of India Mr. Shekhar Sanyal and Senior Advisor IET On Campus University of Moratuwa Dr. Ranga Rodrigo and IET YP chair, Eng. Sajani Thotagamuwa conducted the session. All the participants actively participated in the session and got solved most of their issues related to IET. IET YP chair handed over the Newsletters of IET Young Professionals Sri Lanka Network issued in year 2019 to Dr. Peter Bonfield during this session.



IET Sri Lanka Network Annual General Meeting and Fellowship Dinner

The 83rd Annual General Meeting of the Institution of Engineering and Technology, Sri Lanka Network followed by Fellowship Dinner was held at Hotel Galadari, Colombo from 5.15 pm onwards on Friday, 29th of November 2019. The outgoing chairman's speech was delivered by Eng. Rukmal Jayasinghe who served as The Chairman of IET Sri Lanka Network for consecutive two years (Year 2018- Year 2019). New committee for IET Sri Lanka Network for year 2020 was elected and the new chairman of IET Sri Lanka Network for year 2020, Dr. Lalith Liyanage addressed the gathering and

thanked the past chairman and the committee for their outstanding performance as an IET local network in the region. The Chief Guest of IET Fellowship Dinner 2019 was Eng. Tilak De Silva, The Chairman of Engineering Council, Sri Lanka and in his speech he highlighted the importance of taking membership in Engineering Council of Sri Lanka.

It was a remarkable evening for members of IET Sri Lanka Network with lot of chats, delicious dishes and drinks.

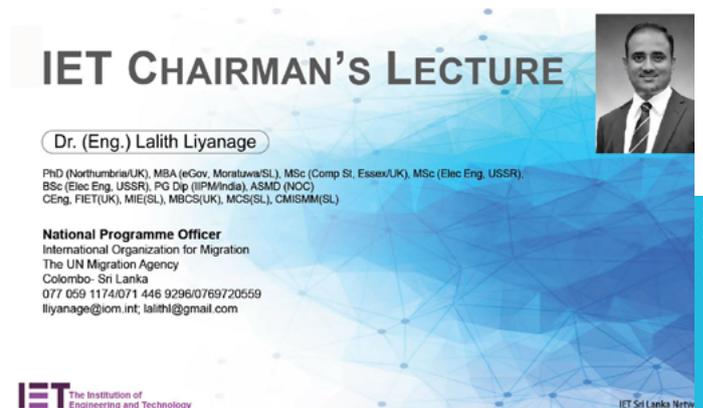




IET Sri Lanka Network Chairman's Lecture

Chairman's Lecture of IET Sri Lanka Network 2020 was successfully conducted from 6.30 pm onwards on 27th of February 2020 at hotel Galadari, Colombo. This Lecture was on "Electronic Governance in a nutshell. what, why and how?" which was presented by Dr. Lalith Liyanage, The Chairman of IET Sri Lanka Network for year 2020. Governments all around the world are working to achieve good governance as it enshrines and encapsulated the expectations of citizens and virtues of government services delivery.

Good governance has been the long-term vision of the governments since the State and Government were computerized by Greek Philosophers in early ages. e- Sri Lanka program which was launched in 2003 which was re-strategized in 2013 aiming at One Government 2020 and further re-energized in 2019 in HE Gotabhaya Rajapaksha's proposal "A Reconstructed Country with a Future Vistas of Prosperity and Splendor" have motivated the speaker to choose this topic to enlighten the audience in this domain. It was an interactive session with the participation of more than 75 IET members.



IET CHAIRMAN'S LECTURE

Dr. (Eng.) Lalith Liyanage

PhD (Northumbria/UK), MBA (eGov, Moratuwa/SL), MSc (Comp St, Essex/UK), MSc (Elec Eng, USSR), BSc (Elec Eng, USSR), PG Dip (IPM/India), ASMD (NOC), CEng, FIET(UK), MIE(SL), MBCS(UK), MCS(SL), CMISMM(SL)

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IET The Institution of Engineering and Technology

IET Sri Lanka Netw

Make it happen with Professional Registration through The Institution of Engineering and Technology

EUR ING. Lakmal Senanayake and Eng. Rukmal Jayasinghe

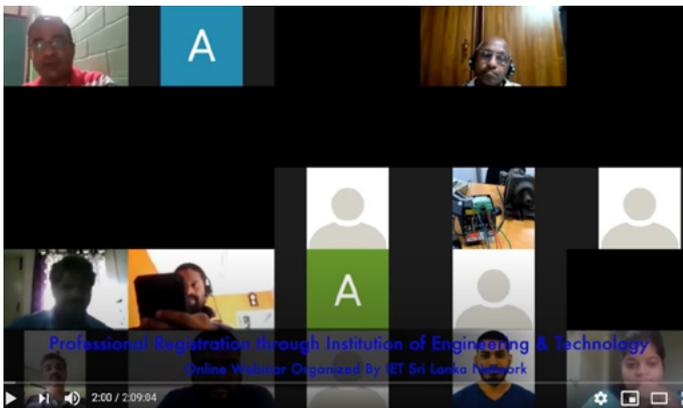
The first ever webinar conducted by IET Sri Lanka Network was held on the topic "Professional Registration through The Institution of Engineering and Technology" on 30th of April 2020 from 5 p.m. onwards. The resource persons were International Professional Registration Advisors for IET Sri Lanka Network EUR ING. Lakmal Senanayake and Eng. Rukmal Jayasinghe (Past Chairman of IET Sri Lanka Network). Professional registration is an important milestone for any engineer or technician. It establishes their proven knowledge, understanding and competence. In particular, professional registration is proof to your peers and employers that you have demonstrated a commitment to professional standards and to developing and enhancing competence.

The IET is licensed by the Engineering Council of UK to award the professional engineering qualifications defined in the UK standard for Professional Engineering Competence. This webinar was opened for both members and non members of IET who are engineers and technicians who are practicing in the industry.



Make it happen with Professional Registration from the IET

Rukmal Jayasinghe
B.Sc (Eng.) Hons., M.Eng., MA (Fin. Econ.), MBA, C.Eng (SL), C.Eng (UK), FIE (SL), FIET (UK), IntPE (SI)
 International Professional Registration Advisor



CEng	IEng
<ul style="list-style-type: none"> BEng Hons (Eng / Tec) With MEng or Doctorate (DEng) EC Post Graduate Diploma <p>Approved by EC UK / UK NARIC (National Recognition Information Centre)</p>	<ul style="list-style-type: none"> BSc Hons (Eng / Tec) Higher National Diploma Foundation Degree in Eng or EC Graduate Diploma <p>Approved by EC UK / UK NARIC (National Recognition Information Centre)</p>
<p>If your qualifications are not recognized by the EC or NARIC Your application direct to Individual Assessment Route</p> <p>Evidence: Transcripts Syllabus Final year projects Authorized certificates An academic reference</p> <p>If your qualifications are not recognized by Individual Assessment Route Your application direct to Technical Report Route</p> <ul style="list-style-type: none"> Initial two-page synopsis of the proposed Technical Report. Full Technical Report should be submitted for peer assessment. 	

Assessment system

Thresholds are defined as	1. No / little competence 2. Some competence 3. Full competence 4. Strong competence
Competences - A and B	Any threshold statement of "No / little competence" - application will be disqualified . More than one "Some competence" threshold statement in each of A and B - application will be disqualified .
Competences - C	3 or more "Some competence" statements - application will be disqualified .
Competences - D	If 2 sub-competences are chosen as "No or little competence" - application will be disqualified .
Competences - E	"No or little competence" or "Some competence" in either of E1, E2 or E5 application will be disqualified . If competence A has 1 "Some competence", competence B has 1 "Some competence" and competence C has 2 "Some competence" and all of D has 3 "Some competence" - application will be disqualified .

EC CEng requirements

Competence - B Apply appropriate theoretical and practical methods of engineering

Practical Requirements for - B (1 to 9)

- How do you analyze the background of the problem?
- How do you conduct engineering research cases?
- How do you consider alternative solutions for the problem?
- How do you identify opportunities for innovative developments in current projects?
- How do you show that solutions are effectively planned and implement?
- How do you identify potential projects?
- Do you conduct appropriate research, design and development of engineering and technology fields?

The webinar is available on Youtube at <https://youtu.be/Mam5rkhdol>.

YOUNG PROFESSIONALS COMMUNITY VOLUNTEER CONFERENCE (YPCVC 2020) IET Young Professionals CC

The YPCC gathered from all around the world for one of their annual meetings and the Young Professionals Community Volunteer Conference (YPCVC). Third IET Young professionals community volunteer conference (YPCVC 2020) was held on 21 -23 February 2020 at Hotel Royal Orchid Bangalore India. Event was hosted by the YPCC and participated 50 IET Volunteers from 19 different countries. Two committee members from IET YP and four members from on campuses participated the event representing IET YP Sri Lanka Network.

This conference having the purpose to inspire each other by sharing their experiences of best practice, updated latest developments of the IET and they provided a forum for us to influence how the IET works for Young Professionals by joining in discussions and idea generation activities through interactive workshops,

presentation and discussions, delegates shared how the IET can support and engage prospective members and volunteers.

Furthermore, Delegates got exclusive chance to ask their burning question related to IET to the IET YP CC panel.

Separate event for on campus members of IET India and IET Sri Lanka was held parallelly with IET YP CVC with exploring and discussing possibilities of making engineering fun and knowledgeable. Networking event and YP focused event also happened on the evening 21st & 22nd February.

The event was a helpful, interactive, formal, and fun.



MEET THE BEST

Drone Revolution

Eng. Prof. Rohan Munasinghe, University of Moratuwa

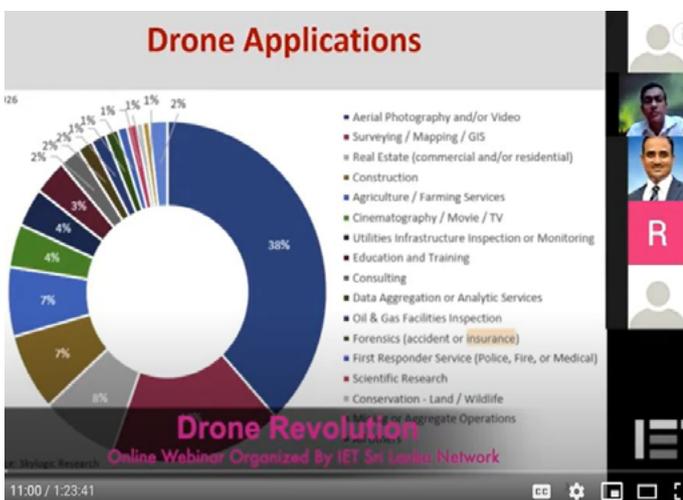
The use of drone technology offers a lot of opportunities in all areas of appraisal. The evolution of Drone Technology and its applications were shared during the webinar conducted by one of most experienced and a pioneer in the field of Unmanned Aerial Vehicles Sri Lanka, Eng. Prof. Rohan Munasinghe, University of Moratuwa on 19th June 2020.

Eng. Prof. Rohan Munasinghe is strongly experienced in Robotics, Control Systems Designing, Intelligent Systems and Unmanned Aerial Vehicles.

The webinar was a great success with many participants.



Eng. Prof. Rohan Munasinghe



The webinar is available on Youtube at <https://youtu.be/dxMvBgifRPg>.

E Talk on “ Evolution from SIM to eSIM and Its Contribution to Digital Disruption”

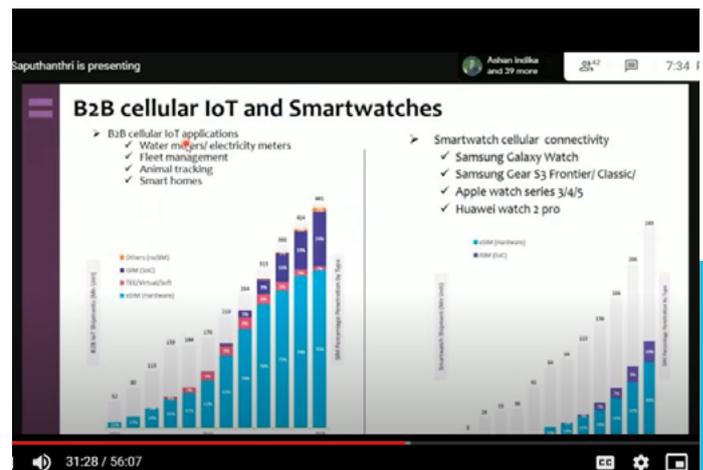
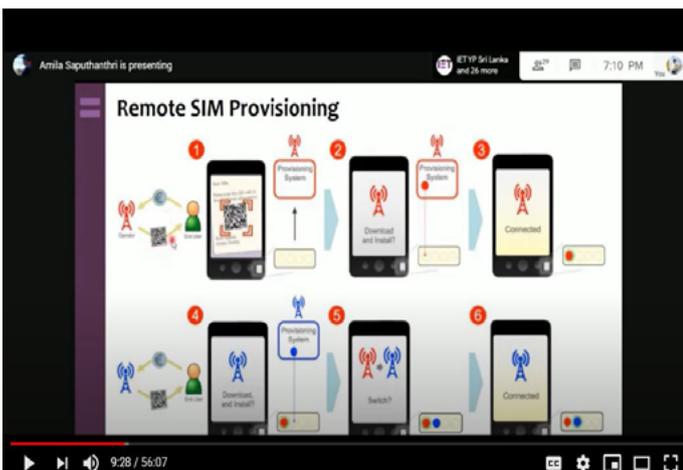
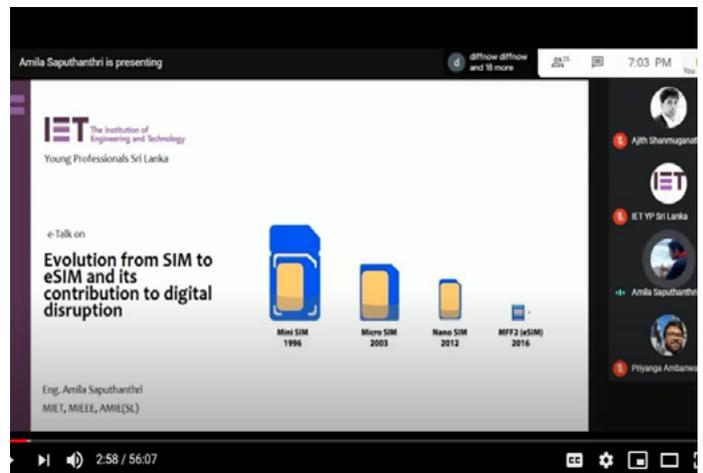
Eng. Amila Saputhanthri, Lead Engineer, Dialog Axiata PLC

The latest evolution of SIM is embedded SIM (eSIM) with Remote SIM Provisioning (RSP) capability. The eSIM ecosystem is governed by GSM Association (GSMA). The two different eSIM standards introduced by GSMA represent consumer domain solutions (profile pull approach) and M2M domain solutions (profile push approach). Industrial applications such as connected cars, smart meters, etc. are using eUICCs in M2M solutions and consumer solutions such as mobile phones, laptops etc. are also embracing the eSIM technology. This has already disrupted the industry with its capabilities such as the ability to swap SIMs remotely, keep multiple SIM profiles in one physical card and space saving.

The webinar was conducted by Eng. Amila Saputhanthri, Lead Engineer, Dialog Axiata PLC., on 13th June 2020 and the event was organised by IET YP Sri Lanka Local Network.



Eng. Amila Saputhanthri



IET Young Woman Engineer of the Year 2019

Dilmi Prabashwari

When the word 'engineer' comes into your mind, what is the picture that your mind conjures? A man in overalls and the protective head gear. The word 'engineer', while gender neutral, in society, it is mostly attributed to males. Realizing this and wanting to promote women in the field of engineering, the Institute of Engineering Technology Young Professionals (IET-YP) Sri Lanka Network launched the 'Young Woman Engineer of the Year' award firstly in 2017.

According to the statistics, Sri Lanka has a female population of 52% but female engineers in the workforce come upto 9% .Cultural influences, familial challenges, societal pressure identified as some of the main reasons behind this story. Many girls aren't encouraged to pursue engineering due to many of them not encouraged to take up STEM fields.

The Institution of Engineering &

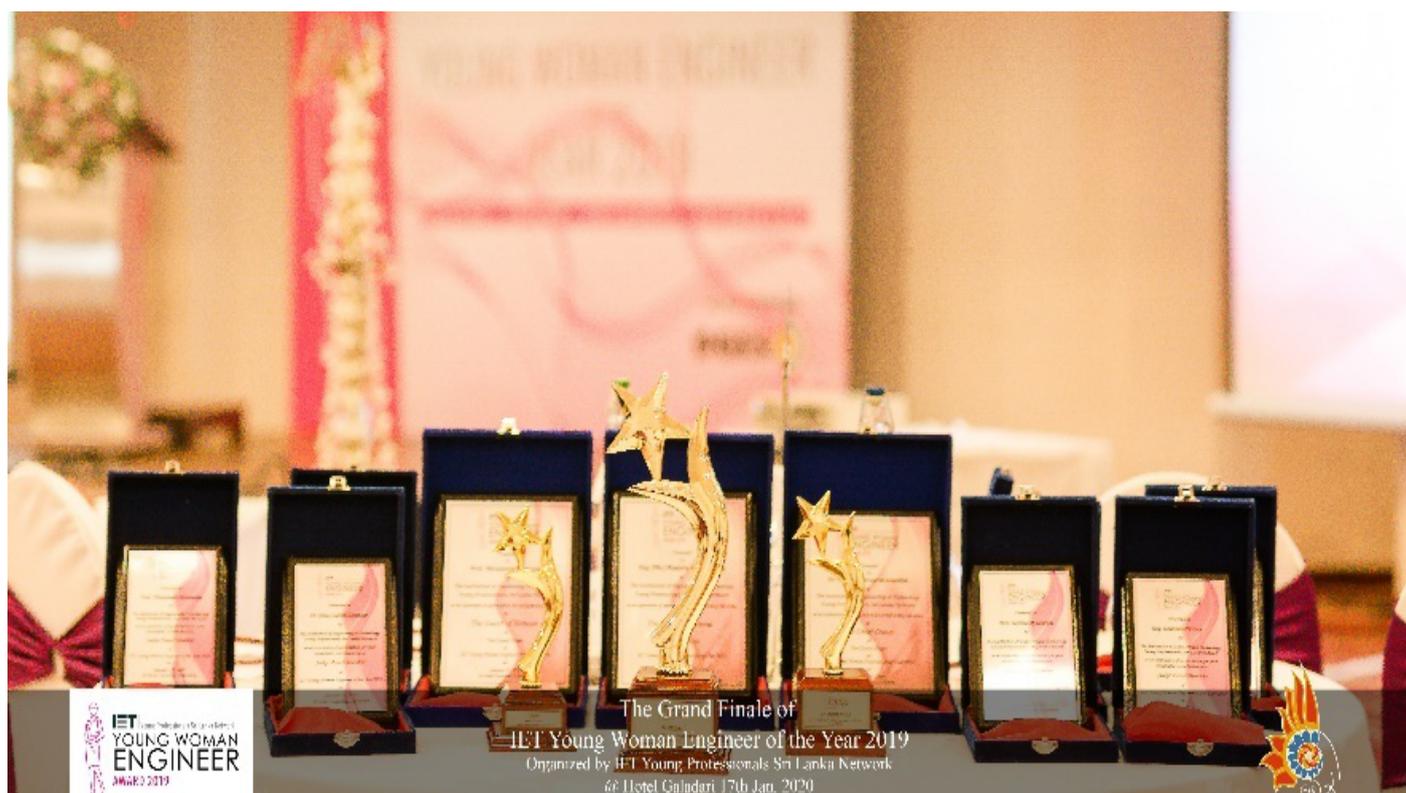
Technology – (IET) launched the event titled "Young Woman Engineer of the Year 2019" for the second time at Members Lounge IESL premises, on 08th of March 2019. Event was graced by few eminent personalities in the field of engineering Mrs. Niranjanie Ratnayake Immediate past president The Institution of Engineers Sri Lanka and Emeritus Professor Department of Civil Engineering University of Moratuwa as the chief guest for the event and Mrs. Rajitha Jayasuriya, Director sales and marketing / capital heights by Access Engineering PLC as the Guest of Honor for the event.

First Round Interviews was held in 17th August from 9.00 a.m to 4.30 p.m at IET Sri Lanka Office at IESL Premises Colombo 7. Out of the received applications 7 candidates (5 finalists and 2 reserve finalists) were shortlisted for the final round as a result of 1st round, where the candidates were interviewed by

judge panels consisting of prominent engineers and professionals in Sri Lanka.

The finalists were Eng. Ravini Hansika, Eng. Erandi Heshani, Eng. Anupama Pathirage Eng. Zahra Marzook and Eng. Prabodhi Mithila. The reserved finalist was Eng. Sanojani Wijesinghe. The 2019 awards ceremony was conducted for the second time on 17 January 2019 at the Galadari Hotel.

In their presentations, the engineers brought out the challenges faced by female engineers in the field. "When a girl decides to choose Maths for A/Levels and then go into engineering, she gets much opposition from society. Even teachers don't support the choice. Then when the girl graduates as an engineer, she faces challenges in her career," stated Eng. Erandi, an electrical engineer by profession.



She shared her experience as an electrical engineer working at a construction site and how she was mostly given to do the documentation work rather than field work. "I had to convince my boss that I was suitable for the job. When I was in the field, the male engineers would always be protective of me but I made the most of the opportunities I got to work in the field," she added.

Other finalists too echoed similar sentiments in their presentations. Ms. Marzook, an electrical engineer at the Lakvijaya Power Plant, shared how motherhood was challenging to the career. "Being a mother is no easy task, and people expected me to drop out after being a mother or not show a stellar performance as I did before being a mother." Family pressure relating to travel, hazardous work environment and work timings were a few other challenges other finalists touched upon.

They also revealed there was a lack of female mentors for female engineers, and a lack of female role

models in engineering for female students to take up the discipline. "Girls think that engineering is a very complex field. While it is complex, if one is interested and is able to grasp the concepts, the field is easier to navigate. Sadly, society and also teachers hardly encourage this field for girls and girls aren't aware of many people in the field to look up to," revealed Ms. Pathirage.

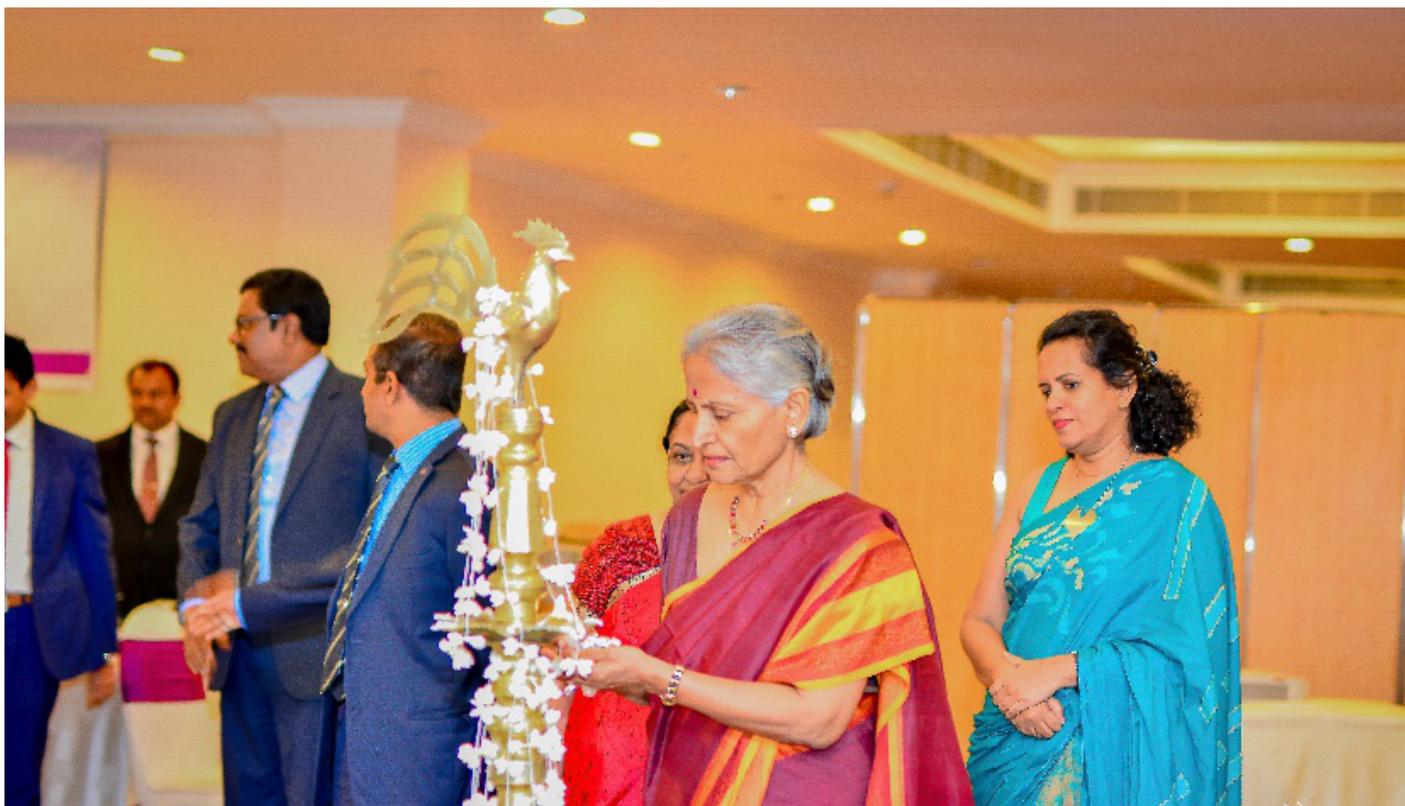
The other finalists shared how some of their mentors in their professional lives were actually men, but added it was challenging to find a good mentor for a female engineer due to the general stereotyping in the field.

"Engineers contribute to the quality of life and can also cause a huge destruction - Dr. Premala-Sivaprakasapillai".

The chief guest of the event, the first female engineer in Sri Lanka, Dr. Premala Sivaprakasapillai, revealed that during her time being a female engineer was unheard of. She stated that she was happy that

there were more females joining the field, but added that not every girl who was talented in Math had a passion for engineering. "Engineering is a challenging field, and one has to have the passion to take on the challenges," she stressed. She added that regardless of gender, that interest and passion had to be there. "Engineers have a huge responsibility as they contribute to the quality of life and at the same time a small mistake on their side could cause a huge destruction. Engineers should always be alert, and this comes from within them when they are passionate about the field," she said.

Speaking at the awards ceremony, Ms. Amarasinghe, the Portfolio Lead of the Sri Lanka Resident Mission of the Asian Development Bank (ADB), explained how though other university faculties had a majority of female students, the engineering faculty had a huge disparity when it came to the male to female ratio.



The chief guest of the event, Dr. Premala Sivaprakasapillai.

"Only 20% of the students are female," she said. She added that due to the engineering field being male dominated, women's voices were mostly unheard. But she advised the young female engineers to be assertive. "Society often confuses assertiveness with aggression when it comes from a woman. But when it comes from a man, assertiveness is seen in a more positive light," she noted. She advised female engineers to stand firm on their decisions and challenge themselves to push through the hurdles and make a niche for themselves in the field.

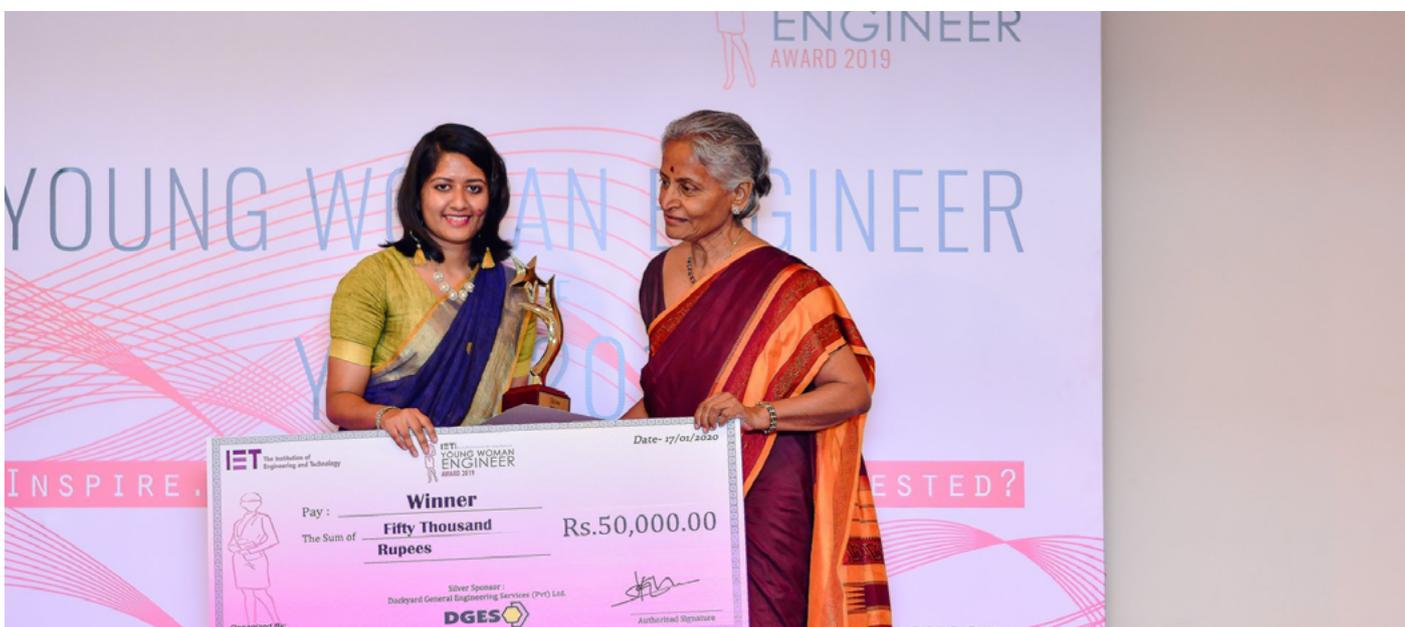
"Only 20% of engineering students are females in the universities across Sri Lanka - Eng. Manjula Amarasinghe"

IET Young Woman Engineer of the Year 2017 winner, Ms. Sashika Fernando said she always wondered why females were encouraged to join the engineering field. She informed the finalists that it was their duty to take up the role of being ambassadors for the engineering profession, and to inspire young women to join the field. "We must debunk the myths and inspire young girls who have the ability and passion to become engineers, yet are unable to due to societal pressure. We must show society that being a female engineer is not an impossibility," she asserted.

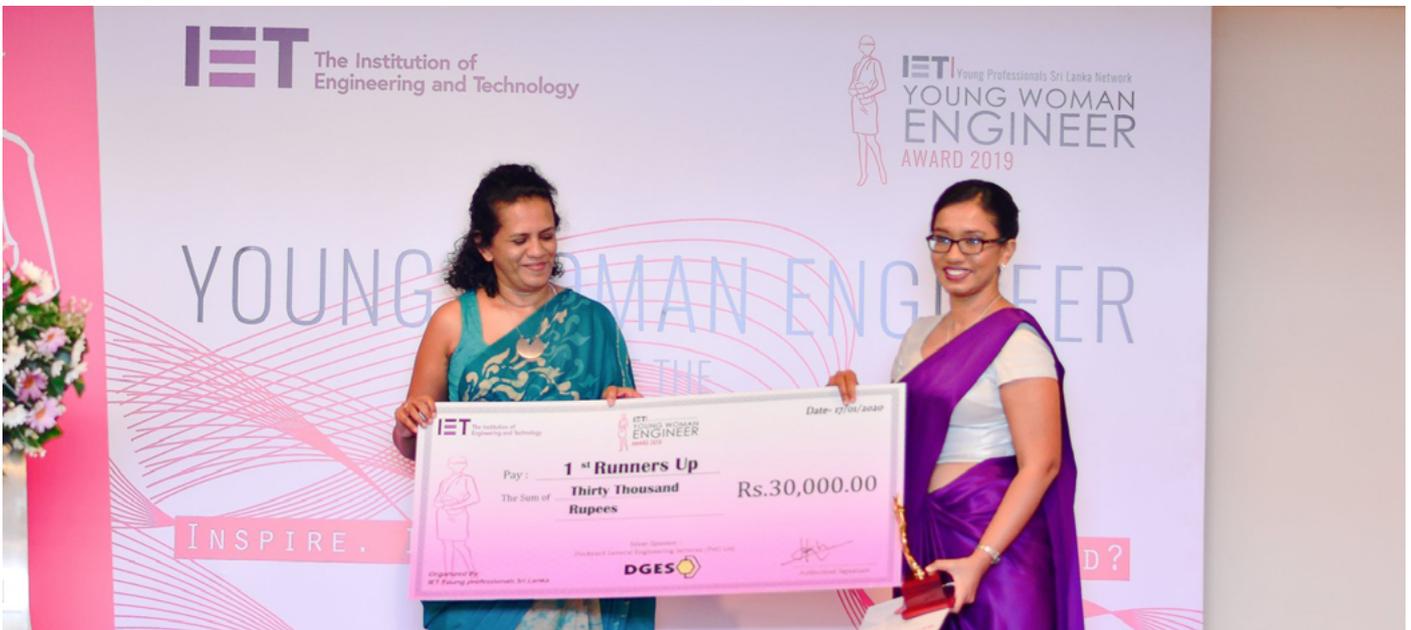
Eng. Lalith Liyanage, Chairman of IET SLN shared his thoughts with the gathering. Event concluded with the vote of thanks delivered by Eng. Thilini Wasundara, event co-chair of IET YWE 2019.



Mrs. Niranjanie Ratnayake Immediate Past President The Institution of Engineers Sri Lanka



The Winner of the IET Young Woman Engineer of the Year 2019, Eng. Zahra Marzook.



First runner up of the IET Young Woman Engineer of the Year 2019, Eng. Erandi Udageachchi.



Second runner up of the IET Young Woman Engineer of the Year 2019, Eng. Anupama Pathirage.



Border Management amidst Health Risks during COVID-19 pandemic in Sri Lanka: Proposed Response of United Nations/International Organisation for Migration

Dr. (Eng.) Lalith Liyanage

1. Situation Overview

Global context

On 3rd February 2020, under the leadership of the World Health Organization (WHO), the COVID-19 Global Preparedness and Response Plan was launched emphasizing the criticality of the United Nations and partners to urgently contribute to preparedness and response efforts. As a formal partner of the WHO, a member of the Strategic Advisory Group of the Inter-Agency Standing Committee's Global Health Cluster, and more recently as a member of the Global Outbreak Alert and Response Network, International Organisation for Migration (IOM) is a key player in responding to public health emergencies globally.

On 11 March 2020, the WHO announced that the COVID-19 disease outbreak which was initially declared as a public health emergency of International concern should now be constituted as a pandemic considering its spread to more than 100 countries.

IOM believes that preparedness and response plans need to be responsive to population mobility and cross-border dynamics. In the event of an outbreak, it is essential to adopt inclusive approaches which take into account migrants – regardless of their migratory status – and counter misinformation that can lead to anti-migrant sentiment and xenophobia.

In order to complement this approach with the needed mobility and border management responses, the IOM Immigration and Border Management (IBM) Division works

closely with the Migration Health Division (MHD) and all other concerned IOM departments/divisions and provides immediate, as well as mid- and long-term technical support regarding the specific activities of immigration, border, customs and consular officials of the concerned Member States. The role of border and migration authorities, and their effective and close cooperation with the competent public health authorities, are essential when tackling a pandemic such as COVID-19.

Sri Lankan Context

The global epidemic of COVID-19 poses a clear risk to the health and wellbeing of Sri Lankans considering the country's borders and internal migration dynamics. It is important to understand the complexities and challenges of mixed migration categories and their dynamics bring to Sri Lanka public health landscape, in the context of COVID-19. There are a large community of mainland Chinese employees working in Sri Lanka. There are many development projects in Sri Lanka and a substantial number of Chinese and other nationals working in these sites. A large number of Chinese tourists visit the island annually.

Further, Sri Lanka is known to be a transit destination for asylum seekers. The fear and stigma around the COVID-19 is further complicated by the anti-migrant sentiments. This is increasingly evident in many channels including social media. The stigma against migrants is common for all types of migrants, including foreigners and Sri Lankans returned to the country from abroad.

Against this outset, IOM envisages the critical need to support Ministry of Health (MoH) of Sri Lanka by establishing a Border Health Division within MOH and Capacity Building of the sector.

2. Proposed Response

The Ministry of Health with WHO published a Strategic Preparedness, Response, and Recovery plan COVID-19 on 06 March 2020. The Strategy has four key pillars; a) Coordination and Partnerships, b) Risk communication and community engagement, c) Surveillance, rapid-response, and case investigation, d) Points of Entry, e) Return Assistance.

This report addresses the Points of Entry (POE) pillar relevant to Immigration and Border Management (IBM) Division of IOM.

2.1 Capacity building and strengthening IT facilities at POE for digitalizing information

International Health Regulation 2005 (IHR-2005) requires a Public Health Emergency Contingency Plan (PHECP) to be developed and maintained in designated points of entry (PoE) for responding to events that may constitute a public health emergency of international concern (PHEIC). Sri Lanka has developed such a document; National Action Plan for Health Security of Sri Lanka, 2019-2023. According to this, all the incoming passengers are requested to fill in a Health Declaration Form at the Health Office of the PoE.

As Migration Governance Unit (MGU) within IOM Sri Lanka, following initiatives have been taken already to fill gaps in efficient and effective integrated border management. The Systems already being developed such as Integrated Border Management System (IBMS), Border Risk Assessment Center (BRAC) and Case Management System (CMS) under IBM project will be in operation soon.

As an immediate step, an extension of BRAC to be located at Immigrations Department Head Quarters shall be established at Bandaranayake International Airport (BIA) to receive Health Declaration forms online in advance together with Advance Passenger Information (API) to be received to BRAC. In this way, Health Officers who will be deployed in this Health BRAC at BIA and other POEs will be able

to intercept risky passengers in advance.

In addition, to address new issues arising due to COVID – 19, a new Health Case Management System (CMS) could be established at POEs which will be linked together with MoH, HQ of National Task Force on COVID -19, Quarantine Centers and WHO Country office in order to digitally record, update and effectively and efficiently manage and control ill travelers including COVID – 19 suspects.

2.2. Establish webinar facilities for PoE units at BIA, Hambantota, Mattala, Palali Airports and Galle, Colombo, Trinco, and Hambantota ports.

With staff capacity building and strengthening of IT facilities at POEs, Webinars could be effectively conducted through Video Con-

ferencing facilities using VPN connectivity. This will enable General Health office/Ministry of Health, HQ of National Task Force on COVID -19 and all PoEs to have effective communications during this pandemic.

In addition, in order to assist Return Assistance, Migration Governance Unit has already launched an Electronic Return Case Management System (eRCMS) which is being already used in European Union.

3.Funding

European Commission, Japanese Government and World Health Organisation have offered funding for any potential project coming under the purview of COVID-19 Global Preparedness and Response Plan.



Dr. (Eng.) Lalith Liyanage

IET Sri Lanka Network Chairman – 2020/21

National Programme Officer
International Organization for UN Migration
Colombo - Sri Lanka

New Trend of Microgrids - DC Microgrids

Eng. Thilini Wasundara

A microgrid is a group of interconnected loads and distributed energy sources located in the same local area within clearly defined electrical boundaries. These localized group of electricity sources and loads can be functioned with the main grid as well as independently. Figure 1 shows a schematic of a typical microgrid. Due to the interconnection with the utility grid, it gives the opportunity to get power from the utility grid and feed-back to the utility grid during surplus power generation. The operation of microgrids offers distinct advantages to customers and utilities, i.e. improved energy efficiency, minimization of overall energy consumption, reduced environmental impact, improvement of reliability. With the distinct fact that microgrids can operate in two different modes, as grid connected and islanded, microgrid control design becomes a crucial factor in microgrid development. In the grid connected mode, Microgrid can import, export or have zero power exchange with the grid. This operation is generally designed for normal operation conditions. In the islanded mode, DESs within the microgrid need to be coordinated to meet the energy demand. In the event of a grid fault, the microgrid can be disconnected from the utility network supplying the critical loads. This improves the

power security, reliability, and quality of the grid.

In the present power system networks, several types of microgrids are available. Their advantages, drawbacks and usefulness vary according to the type of consumers and applications. Mainly microgrids can be categorized into 3 types. AC microgrids, DC microgrids and Hybrid type microgrids.

With the higher penetration of renewable based DGs, such as solar PV, together with the increasing use of electronic loads and Electric Vehicles (EVs) DC distribution systems are gaining research attention again. DC microgrid concept has been in use for many years in areas such as traction, telecom, and vehicular technology. In recent years microgrids are very popular due to the increase in penetration of distribution generators that include renewable energy and increasing research attention and innovations towards the sustainable energy. DC microgrids provides a means of reducing the conversion stages in interfacing renewable energy sources with, electronic loads and ESSs reducing the cost and losses of conversion, while increasing the efficiency of the power transfer in the distribution level.

Normally, Common DC bus is used in DC microgrids and all DESs, loads and AC generating units are connected to that. AC/DC rectifiers are used for connecting AC generating units. To supply AC power, DC/AC inverters are used. In a DC grid system, the energy sources and power electronic loads can be supplied more effectively and efficiently by choosing a suitable voltage level and thereby avoiding a few conversion stages. Operation and control of a DC microgrid is focused on maintaining a constant voltage in the DC bus. The control architecture of a DC microgrid depends mainly on the DC microgrid topology. The DC microgrid topologies can be classified as single bus structure, multi-bus structure and reconfigurable structure. Generally, the single bus structure is adopted by low-voltage DC microgrids.

DC Microgrid Architectures

Due to the intermittencies and uncertain due to the dependency on weather conditions, it is very important to have an AC inverter to improve the reliability and availability of power in a DC microgrid. Therefore, the following interfaces can be used to connect with AC grid. Configurations of DC microgrids can be classified into four categories such as Radial configuration, Ring configuration, mesh configuration and zone configuration.

Radial Configuration

Radial configuration can be seen that DC bus is interfaced with an AC grid at one end and power flows along a single path towards the loads. So, only one path is available between each load to the AC grid interface. It can offer advantages such as simplicity, multi voltage level and ability to share the power to neighboring buses.

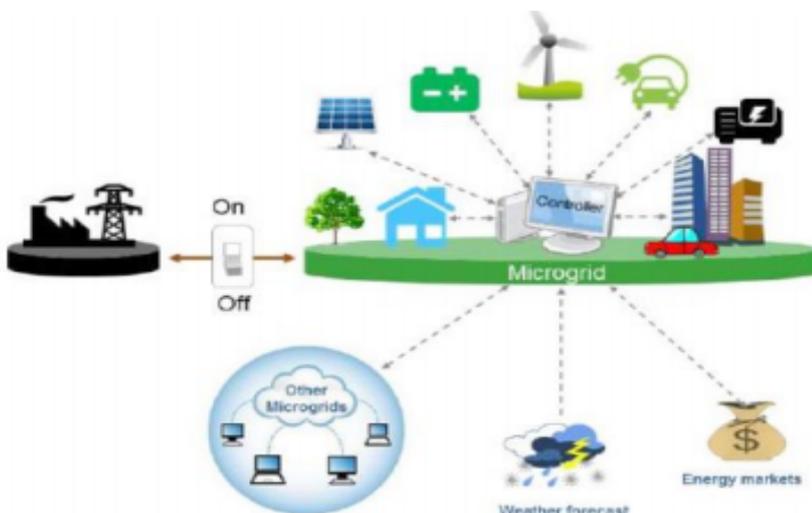


Figure 1: Microgrid Model

Ring or Loop Configuration

Ring configuration can be seen that there are two or more paths between the AC grid interface and the customers in this configuration. It gives the flexibility to isolate the faulty bus in the system. It is more reliable compared to the radial system.

Mesh Configuration

Mesh configuration is an advance arrangement of ring scheme. Different DC microgrid architectures are possible based on this configuration. More than one AC grid interfaces are connected to the DC grid. Compare to the ring and radial configurations, this type offers more flexibility and more reliability. But the controlling and protection is difficult compared to radial and ring configurations.

Zonal Type Configuration

Zonal type configuration can be seen that the distribution system is subdivided into number of zones. It provides multiple buses to supply power to the loads. Each zone relates to two redundant DC buses. It improves the reliability of the system and provides better availability of power. Power can be supplied from multiple buses simultaneously. Like the mesh configuration, control and protection is difficult in this configuration.

Voltage Controlling of DC Microgrids

Regulating the DC bus voltage at a constant value is most critical and important feature in DC microgrids. Two types of voltage controlling methods can be used.

Voltage Droop Control Method

This method is a decentralized method which requires no communication between different devices. In this method of voltage droop, the DC bus voltage is measured at the

points of coupling of the converters and it is used to calculate the amount of energy that each load or source will consume or supply.

Master Slave Method

This method mainly depends on the communication between the master converter and interface converters. The master module controls the DC bus voltage and sends reference signals to other slave modules while the slave modules control the current. It needs a fast communication channel between modules.

DC Microgrid Voltage Polarity

The power in the microgrid can be transmitted using two wire (unipolar) or three wire (bipolar) system.

Unipolar System

Between two wires of positive and negative, all sources, converters and loads are connected. It is simple to implement and there is no chance for asymmetry between DC poles. But it does not offer redundancy and fault in the system can be led to complete shutdown of the system.

Bipolar System

It consists of +VDC, -VDC and neutral line. Consumers have choice to select voltage levels +VDC, -VDC and 2VDC. These different voltage levels offer more flexibility and decrease the required number of DC-DC converters.

Comparison between AC & DC Microgrids

Many types of electrical loads use DC power natively - Most of electronics components such as computers, servers, and TVs use dc power. LED lights also use dc power natively. Several types of motors and drives (especially variable speed drives) use dc power.

Many renewable energy sources provide DC output - Solar photo-

voltaic and fuel cells produce dc current directly, and many wind power systems can easily produce DC current and interfaced to the AC grid through a DC link.

Energy storages are typically DC

- Batteries and super capacitors use DC current by their nature for charging and discharging. This includes the batteries in electrical vehicles, meaning dc power systems can easily integrate with vehicle-to-grid systems.

Synchronization - No need to consider synchronization with the utility grid in DC microgrids.

Conversion efficiency - DC microgrids are more efficient compare to the AC microgrids. The power flow in a DC microgrid skips the AC stage, thus eliminating the losses brought by DC/AC and AC/DC conversions.

Transmission / distribution efficiency

- In DC transmission, there is no reactive power concern. As a result of that transmission losses caused by reactive current in AC system is eliminated. Due to the DC current, less copper loss is produced during DC transmission.

Power supply reliability - In DC microgrids, it can provide uninterrupted power supply during utility grid outage. When a blackout or voltage sag occurs in the utility grid, it does not affect DC bus voltage.

On off cost on converters - A common DC/AC converter is normally used for interfacing the DC microgrid to AC utility grid whereas in an AC microgrid, DC/AC converters have to be equipped with every distributed source. As the power rating of the common DC/AC converter in a DC microgrid is normally less than the total power rating but greater than any of the individual unit rating in AC counterparts, the one-off manufacturing and installation cost is reduced in DC microgrids due to higher

per-kilowatt cost on converters of lower power ratings.

Simple to control - DC microgrid voltage only affected by the active power, therefore it is simple to control.

Drawbacks

It is needed to construct private dc distribution line for dc micro-grid. The protection in dc system is more difficult than the AC system's because there is no zero cross point

of voltage in DC system.

The loads adapted for dc power supply are required for high system efficiency.



Eng. Thilini Wasundara

IET Membership No - 1100617291
Hon. Sectary of IET Young Professionals Sri Lanka Local Network.
IET Young Professional Ambassador
IEEE PES Day 2020 Young Professional Sri Lanka Section Ambassador

The author is graduated from University of Moratuwa specialized in Electrical Engineering. Currently working as an Electrical Engineer in Minel Lanka Pvt Ltd.

Publications:

Low Voltage DC Microgrid Control Strategy Using Single Phase DQ Transformation published in IEEE Mercon 2019 International Research Conference.



Sri Lanka Network

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During the COVID-19 lock down, we have decided to limit our physical events as much as possible until end of June for time being as a responsible organisation to safeguard member well being. However, in order to be in touch with you all, we have created the shown social media channels. We strongly advise and request you to subscribe, like and follow IET Sri Lanka Network



The Institution of
Engineering and Technology

Sri Lanka Network

ATC 2020

27th Annual Technical Conference

29th August 2020, Hotel Galadari, Colombo

<http://www.ietatc.lk>

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CALL FOR PAPERS

The 27th Annual Technical Conference of the IET Sri Lanka Network will be held on Saturday 29th August 2020 at Hotel Galadari. The conference is organized by the IET Sri Lanka Network and will focus on theory and applications covering topics related to engineering disciplines such as Electrical, Electronics, Mechanical, Civil, Aeronautical, Marine, Communications, Computer, Production, Biomedical and Information Technology.

The conference is intended to provide a forum for the presentation of research papers, and to foster interaction between persons from industry and the universities.

Prospective Authors (a member or group of members of the IET or a non-member with at least one member of IET as a co-author) are invited to submit Abstract/ full paper they intend to present at the conference by email, giving their contact details in the format given in www.ietatc.lk

The topics of interest include, but are not limited to:

- Power Systems
- Machines
- Automatic control and Applications
- Management of Technology
- IT Related Applications
- Robotics & Machine Learning
- Electronic Manufacturing
- Cyber Security
- Artificial Intelligence
- Communication Networks
- Mobile and Wireless Technologies
- Microwave and Optical Communications
- Broadcast Technologies
- Radar and Navigation
- Electronic Devices and Circuits
- Electromagnetics
- Antennas & Propagation
- Biomedical Engineering
- Renewable Energy



Important Deadlines:

Abstract submission: -
15th May 2020

Notification of acceptance: -
25th May 2020

Full paper submission: -
15th June 2020

Notification of acceptance: -
01st July 2020

Submission of Final (improved) paper
01st August 2020

Conference
29th August 2020

The submissions can cover research and development, state of the art technologies of any engineering field, industry reforms and policies for development and engineering education in the relevant areas. The abstracts should highlight the innovative features of the paper.

Publication of Papers:

Papers are fully refereed. The authors of the selected papers are invited to present their papers at the conference. Papers presented at the conference will be published in the Conference Proceedings of the IET Sri Lanka Network.

Paper Submission:

Paper Abstracts should be around 500 words.

Full papers should be about 8 to 10 sheets of A4 size paper and typed double column in 10 pt Times New Roman font.

A Template for the full paper is available in the www.ietatc.lk web site.

All abstracts and full papers should be uploaded to <http://ietatc.lk/paper-submission-instructions/> as pdf files.

Certificates:

Certificates will be awarded for all selected papers at the conference.

Mailing:

All correspondence should be addressed to:
Eng. (Dr.) Anuradha Jayakody
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120/15, Wijerama Mawatha Colombo 07.
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Editor's Note:

I am delighted to bring you June 2020 bi-annual newsletter of the IET Sri Lanka Network! The scope of the bi-annual newsletter is to ensure that all core topics are covered with high-value content and with news, views and engineering updates.

Few interesting projects are illustrated in the newsletter shows just how creative engineers can be at solving the various challenges and how they worked to manage the impacts of COVID-19. The competition, IET Young Woman Engineer of the Year 2020 is and the Annual General Meeting and Fellowship Dinner were splendid events organised before the Pandemic. In the times of lockdown, a series of Webinars were conducted to enhance the engineering knowledge as indicated in Meet the Best Section.

Finally, Many thanks to Eng. Sajani Thotagamuwa and Eng. Vindya Wickramarachchi for the great contribution during the preparation of June 2020 bi-annual newsletter and I am really encouraged by the feedback received from the Members too.



Eng. Major Buddika Herath
The Editor IET Sri Lanka Network Newsletter



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