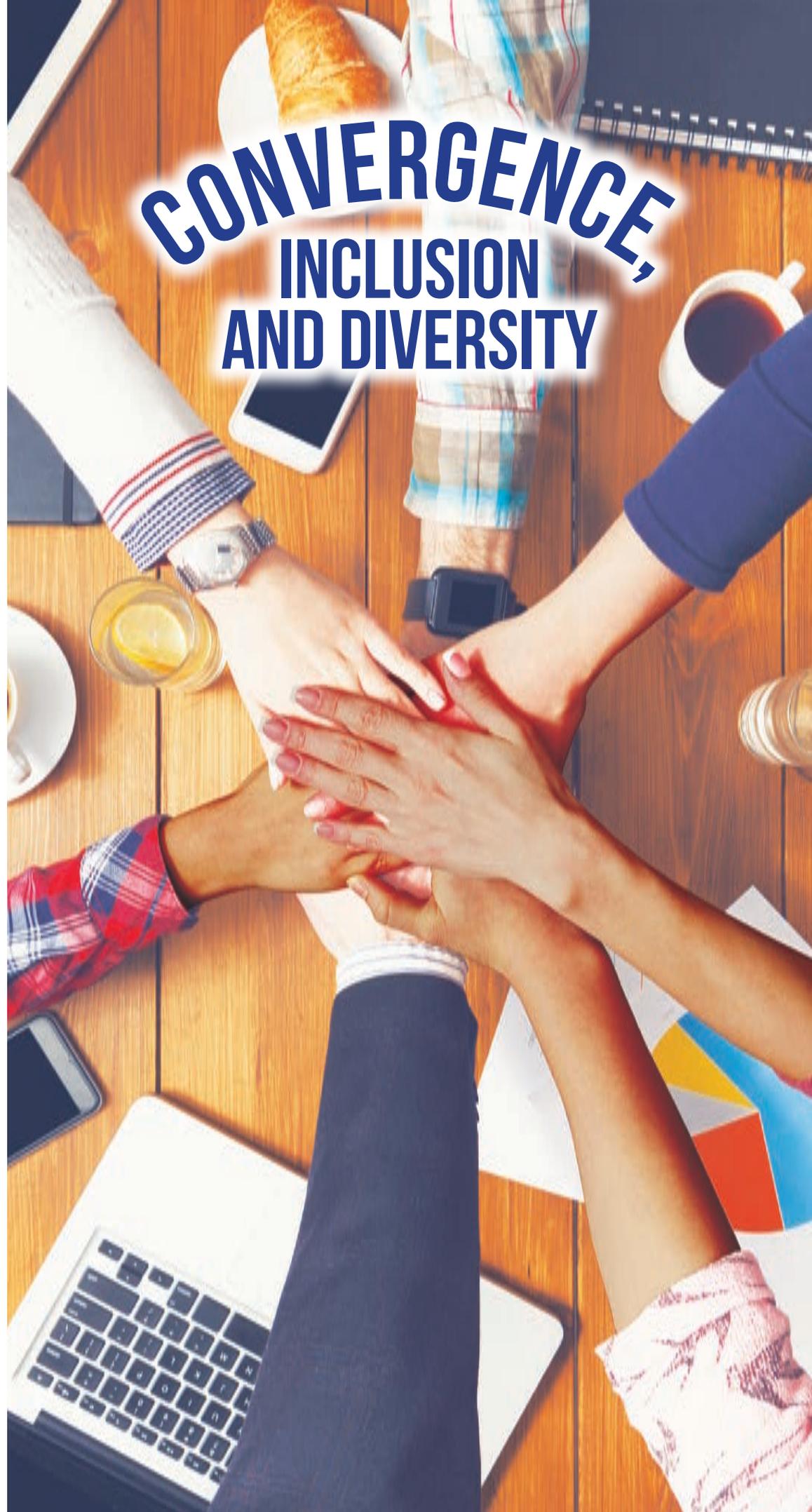


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SEALOSTICK- Cold Applied Self-Adhesive Waterproofing Membrane

Retaining wall

R.C Structure dosed with Mixkote MIM Crystallization Waterproofing Admixture

Centreseal PVC Waterstop

R.C Basement Slab

Backfill

DETAIL A

R.C Structure dosed with Mixkote MIM Crystallization Waterproofing Admixture

R.C Basement Slab

Lean Concrete

Earth

SEALOSTICK- Cold Applied Self-Adhesive Waterproofing Membrane

DETAIL B



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cover note



Convergence, Inclusion & Diversity

by Ir. Mah Siew Kien
Chairman,
Women Engineers Section

In this issue of *JURUTERA*, IEM Women Engineers Section focuses on liberating leadership and leveraging on streams of global talent in a new world where convergence has become the baseline.

We must prepare the next generation of Science, Technology, Engineering & Math (STEM) professionals to ensure that a robust national talent ecosystem goes beyond just setting policies, monitoring compliance and showing statistics. It's important to create an inclusive workforce, cultivate diversity and promote collaboration so that people from different backgrounds, gender, age and abilities can come together and work towards a common goal.

Diversity is about overall life experiences and relationships: Gender, age, race, ethnicity, marital status, spiritual belief, physical ability, work experience and educational background. A recipe for success will focus equally on diversity and inclusion. We can unlock society's biggest potential when we have inclusivity as well as the sense of belonging and acceptance. A converging world is the key to building true acceptance of diversity.

Diversity can be likened to being at a dance party where there's plenty of diversity. Inclusion is being invited to dance when you're there. To be inclusive means making every individual count.

Let's dance together! ■

REMINDER

**59th Annual General Meeting
The Institution of Engineers,
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21st April 2018

CONVERGENCE,

Inclusion and Diversity



Adapting to an increasingly convergent world, disruptive technologies and a changing workforce, a nation must have the infrastructure, government and education level required to support and utilise the technological advances to increase productivity and GDP per capita, ultimately achieving a common level of prosperity. The increasing speed at which new technologies is spreading across international borders is a phenomenon of convergence but we do not see convergence in all countries, only among industrialised nations. Preparing the future workforce with Science, Technology, Engineering and Maths (STEM) skills is a key requirement for future digital economy.

In Malaysia, the demand for engineering graduates has far exceeded supply and industry players often lament the shortage of STEM workers. "When solving problems, dig at the roots instead of just hacking at the leaves", said Anthony J. D'Angelo, founder of Collegiate EmPowerment. Engineering relies heavily on maths and science. Malaysia had set a target ratio (in 1967) of 60:40 science-to-non-science students at the Upper Secondary School level but the number has fallen to a dismal 21% of students taking pure science classes today. Indeed, the 4th Industrial Revolution (4IR) is moving at an exponential pace and our country needs more scientists and engineers to keep up with the growth in order to compete in the global marketplace. Creating a diverse, healthy, inclusive and sustainable environment where all communities can thrive is more important than ever for any nation to move ahead.

This year is Women Empowerment Year. The World Economic Forum's 2017 Global Gender Gap Report revealed that women are very much still underrepresented in the STEM fields. Many will agree that diversity is a concern as well as an opportunity. However, diversity can mean something different to different people. IEM Women Engineers Section believes that the way to address the decline of STEM interest is to be inclusive and empathetic in ensuring education systems are equitable for all students from diverse backgrounds, perspectives, life experiences, way of thinking and to adapt to the needs of differently-abled groups. Teams from IEM

Women Engineers Section have been conducting talks, engineering exhibitions and workshops in schools and community centres with the aim to foster diversity and inclusion in STEM in order to create the next generation of engineers by helping young people to understand the variety, excitement and opportunities presented by a career in engineering.

To understand the underlying problems, challenges and to improve the team's effectiveness and to garner greater results, IEM Women Engineers Section speaks to three prominent figures: Datin Paduka Ir. Dr Siti Hamisah Tapsir, Director-General of the Ministry of Higher Education (MOHE), Prof. Dato' Dr Noraini Idris, Chairman of National STEM Movement and Deputy Vice-Chancellor (Research & Innovation) of Universiti Pendidikan Sultan Idris, and Ir. Prof. Dr Lee Sze Wei, Organising Committee Chairman of Kuala Lumpur Engineering Science Fair (KLESF) and VP of UTAR research, development and commercialisation.

Even if she is given another chance to choose her career path, Datin Paduka Ir. Dr Siti Hamisah Tapsir says she will still opt for Engineering in a heartbeat. Why? "An engineer is always focused and very structured. We identify the problem, strategise the way forward and seek the solutions to the problem. This is what I love most about being an engineer because I can apply my set of related knowledge, skills, and abilities to successfully comprehend other life perspectives such as finance, education and health," she explains.



Datin Paduka Ir. Dr Siti Hamisah Tapsir



However, when IEM Women Engineers Team asked for career ambitions of today's children, she said very few aspire to be engineers, as STEM-related fields are "difficult". To show the children that STEM subjects are "interesting and not difficult", it is important to start early to stir children's interest in STEM, from primary to secondary and then to tertiary level education.



Professor Dato' Dr Noraini Idris

The number of students taking STEM subjects has declined in the last decade. The diminishing interest in STEM is a global phenomenon and not just a Malaysian problem. Prof. Dato' Dr Noraini Idris's passion for STEM education drove her to take the leap into establishing the National SETEM Movement in 2015.

"Malaysia's performance in STEM subjects has slipped and if the decline

continues, we may be unable to supply the skills required for the future workforce", she says, a frown shadowing her usually jovial face. With the 4IR and National Transformation Programme, we need a workforce of problem solvers, innovators and inventors as lots of things involve the use of Artificial Intelligence (AI). When it comes to AI, students need to be strong in Additional Mathematics and the fundamental sciences, but right now, they are not. Students are often in a passive or receptive mode in the current teaching and learning process. Dato' Noraini highly recommends teachers to incorporate experiential-based learning into the curriculum and use strategies to encourage inquiry-based learning in teaching and learning.

"In Singapore, teachers have to go for 100 hours of training annually. They take turns to do so. However, this has not been the practice locally. We are proposing something similar for Malaysia so that our teachers can continuously learn new techniques and be able to teach students from culturally and linguistically diverse backgrounds, even working with socially disadvantaged students. It's no longer about getting a job; today it's about producing job creators, not job seekers", explains Dato' Noraini. She often cited Singapore schools as excellent examples of hands-on teaching but was chided for comparing us with the smaller island republic. "But it's not about size, it's more about attitude and motivation" she notes.

National STEM Movement, started the mentor-mentee programme in 2016 to bring together mentees (Form 1-3 students), mentors (science undergraduates, industry partners) and facilitators (academicians, employers) to guide students through a STEM education and career. Mentors go to schools to inculcate a greater interest in STEM by showing mentees how interesting it is and teachers can

bring students to universities to see what it's all about. This year, the National STEM Movement, in collaboration with Malaysia Technology Expo (MTE) 2018, will be conferring the inaugural STEM Mentor-Mentee Awards.

"The promotion of STEM education in schools will not succeed without the support from teachers, especially headmasters and headmistresses. It is my hope that everyone in the community will step up to help National STEM Movement in facilitating our nation to achieve its vision of developing a scientific and innovative society by the year 2020," says Dato' Noraini. "We want to ensure there are enough students taking STEM subjects in schools as this will later impact the intake in universities. The Parents-Teachers Association (PTA) or Persatuan Ibu Bapa dan Guru (PIBG) may assist by inviting companies which produce



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gadgets and tech tools to give talks and demonstrations in school as technology tools can be used to enhance learning. The progress, although slow, is happening and students are happy.”

The movement has also organised many STEM colloquiums to discuss the research and information on current issues, challenges and strategies to improve STEM education. STEM carnivals and roundtable dialogues are also held to create awareness and career motivation in STEM fields. “We need to build a strong STEM-capable workforce. The situation is critical,” Dato’ Noraini opines. She calls for a “cradle-to-career” approach to improve STEM education. She aspires to reduce educational opportunity gaps and

improve the success of students in STEM fields. Dato’ Noraini hopes more people will come forward to support National STEM Movement events and more companies will provide sponsorships. “The goal is to provide children with more hands-on opportunities and so inculcate an interest in STEM”, she concludes.

Datin Paduka Ir. Dr Siti Hamisah Tapsir reiterates that the decline of students undertaking engineering-related courses or STEM is a worldwide phenomenon. Malaysia is not alone in facing this quandary because the digital natives prefer more glamorous professions with high salary offerings. With regards to gender and course offerings, she says that generally there are more female than male students in the higher education institutions but concedes that engineering is still dominated by male students. Most women engineering graduates embark into teaching or business rather than pursue the engineering profession. She believes that developing a strong female engineering talent pipeline will definitely be beneficial to the future of the nation.

With regards to the Ministerial effort, MOHE has undertaken a multi-pronged approach to ensure that higher education remains relevant. “The 4IR has brought about technology advances that will change the world scenario. It leverages on disruptive technologies such as Artificial Intelligence, Big Data, Internet of Things, Cyber Security, Cloud, Mobile Internet and Advanced Robotics,” says Dr Siti Hamisah. “In view of this, we have devised the Higher

Education 4.0 framework in which we highlight four main thrusts for universities to remain relevant in this challenging time, namely future ready curriculum, agile governance, research and innovation and talent development. Apart from preparing institutions of higher learning to confront the 4IR, we also need to produce students who are future proof – prepared and equipped with the skills and attributes to face the future.

“In 2017, the Ministry redesigned the higher education system by introducing several initiatives. One of these is 2u2i where students spend two years in the university to learn the theoretical aspects and the final two years to apply such knowledge in the industry. Another initiative is the iCGPA initiative or the Integrated Cumulative Grade Point Average



Science Fair @ The School at Jaya One (in association with National STEM Movement)



Science Carnival @ SMK Sri Andalas

where we emphasise the students’ social skills, ethics and values, communications and a few other domains in order to shape them in becoming holistic, entrepreneurial and balanced.”

She says the CEO@Faculty programme is another redesigning initiative where selected CEOs of multinational companies engage in 30 hours of lectures per year to the university students and academia. There were only 24 CEOs who participated in 2015 but the number increased to 67 in 2017. Tony Fernandes and Universiti Putra Malaysia are good examples of the collaborative effort between industry and academia in the CEO@Faculty programme.

“MOHE believes that University and Industry are one. We want universities to get closer to the industries,” says Dr Siti Hamisah. “We need to produce students who are creative, innovative, resilient, flexible, and adaptable with technology, along with big data and humanistic competencies. With the advances of technology where artificial intelligence has proven that computers and machines are able to function in an intelligent manner, we need people to remain human. We need to enhance our emotional intelligence and mindfulness because these ‘human elements’ will differentiate us from the robots. Statistics indicate that more than 75% of our graduates are employed within 6 months but we are targeting 80%. The Ministry is also aiming to achieve at least 5% of graduates who can create jobs for others rather than look for jobs. The trend is changing. Graduates today are more creative and innovative and they prefer to be their own bosses as tech-entrepreneurs.

“Technology changes rapidly, so students need to embrace lifelong learning so that they can be retrained, upscaled and upgraded. Today, there are teaching firms in some campuses which allow students to spend a number of hours working in these firms. We encourage firms to set up their entities in the universities as our universities are very competitive. For instance, University Malaya’s Engineering School is ranked among the Top 10 in the world (28 November, 2017) by the US News Education website.”

Dr Siti Hamisah concurs with Dato’ Noraini that interests in STEM-related programmes must be established at the Primary School level. “Engineers and engineering students should go to primary schools, interact and help the young children understand what engineering and science are all about, maybe as simple as demonstrating the motion of a toy car,” she says. “In my time, we chose the academic programme which could, perhaps, change the economic status of our parents and our families. With engineering, we would definitely secure a job. Today’s children are different. Their parents have provided the financial stability, so their employment objectives are diverse and unique where the socio-economic status may not be central in their choice of academic programme.”

The annual Kuala Lumpur Engineering Science Fair (KLESF) offers programmes, activities and competitions aimed at instilling STEM interest among primary and secondary school students. Ir. Prof. Dr Lee Sze Wei feels that students not interested in STEM subjects because



Ir. Prof. Dr Lee Sze Wei

will enroll in STEM courses in universities which are currently experiencing very low enrolment levels. Stakeholders in the industry must come forward to send strong signals to the general public that there is a shortage of STEM professionals. They should create greater awareness that it is necessary to teach STEM at primary level to meet this demand in the future.

The industry should come forward and be a leader in addressing the

root-causes instead of lamenting the lack of qualified STEM graduates to fill key positions.

To create interest in STEM among primary and secondary school students, Prof. Lee suggests that every stakeholder be more receptive to new approaches and efforts dedicated to address STEM issues. The learning process must be diversified as times have change and we have to change with the times. He encourages schools to conduct more science-based projects, to include STEM programmes in the

co-curriculum and to organise STEM-based competitions. Teachers should participate in STEM activities organised by universities and be made more aware of the importance of STEM so that they can impart this to students. Sometimes, schools also face challenges in promoting STEM, especially when it comes to budget and funding.

Prof. Lee says: "For some schools, there may be logistics issues such as transportation, lodging and food for students to participate in STEM events. In this case, the PIBG can play a more active role by supporting activities related to STEM. Parents have a definite role to play in encouraging STEM education."

He concludes by saying that awareness is key and industry players must stress this to the students, parents and community. Some parents think STEM has little relevance to daily life and significance to their children's career path. "Make everyone realise that there will be a huge demand for STEM graduates. Right now, the message is just not getting through," he reiterates.

CONCLUSION

STEM education is vital in building nation and economy. Shaping a diverse and inclusive workforce is important to propel economic growth. Diversity is a journey. Let's keep raising the pace in STEM education to create an all-inclusive atmosphere that will ensure our nation thrives in an increasingly convergent and digital world. ■



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Close Encounter with Cosmic Icon Datuk Dr Mazlan Othman



Ir. Sharifah Azlina
Raja Kamal Pasmah

Professor Emerita Datuk Dr Mazlan Othman has a long list of firsts. She graduated as Malaysia's first astro-physicist and, on completion of her doctorate degree, she became the first woman in University of Otago's 120-year history to get a PhD in physics. She returned to Malaysia to be a lecturer at Universiti Kebangsaan Malaysia in the Physics department. In 1990, she was seconded to the Prime Minister's Department to establish the Planetarium Division, later known as Space Studies Division (1993), and thereafter became its head. As its first Director-General, she led in the designing and manufacturing of Malaysia's first remote-sensing satellite, TiungSAT-1, which was launched in 2000. In 1999, she was appointed the first female director of the United Nations Office for Outer Space Affairs (UNOOSA), based in Vienna, Austria.

In 2002, at the request of the then Prime Minister of Malaysia, she returned to serve as the founding-and-first Director-General of the Malaysian National Space Agency (ANGKASA) and spearheaded the Angkasawan Programme which successfully launched the country's first astronaut, Datuk Dr Sheikh Muszaphar Shukor, into the International Space Station (ISS) in 2007. ANGKASA is responsible for the development, research and dissemination of space science programme including formulating policies and regulation, coordinating, implementing and monitoring all activities related to space.

In 2007, as she "hadn't quite finished her task", she was re-appointed Director of UNOOSA in Vienna, followed by an appointment as the first female Deputy Director-General of United Nations Office, Vienna in 2009. Datuk Dr Mazlan retired from the UN in 2013.

I was in awe when, as an alumni, she visited our alma mater, Tunku Kurshiah College, back in the early 1980s. She was already well ahead then in charting her career, while I was still a teenager who hadn't a clue as to what I would be. Three decades later, I was still in admiration, listening to her inspiring achievements when she granted me a courtesy call at her

United Nation's office in Vienna, in 2011.

Today, the remarkable Datuk Dr Mazlan still has a similar impact on me. Short of her retirement, she was contemplating about "taking it easy and enjoying life' but soon, the tireless scientist was back in Malaysia, pouring her energy into advisory committees and boards involving science and space, teaching as a visiting professor and became the Project Director for Mega Science 3.0 at the Academy of Sciences, Malaysia.

MEGA SCIENCE 3.0

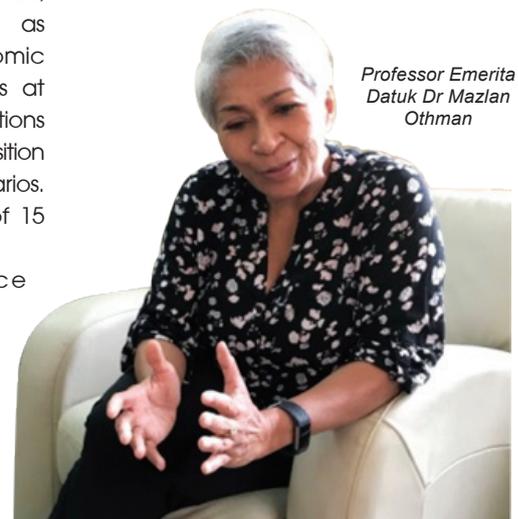
Mega Science is a project championed by the Academy of Sciences Malaysia to position Science, Technology and Innovation (STI) as the key driver for socio-economic transformation. The project looks at global mega trends with projections into the year 2050 and aims to position Malaysia within these future scenarios. Under the programme, a total of 15 sectors are covered:

- First phase: Mega Science 1.0 (2010-2012) focused on the water, energy, health, agriculture and biodiversity addressing energy for the future.
- Second phase: Mega Science 2.0 (2013-2014)

focused on housing, infrastructure, transportation, electrical & electronics and the environment.

- Third phase: Mega Science 3.0 (started in 2015) is more industry-focused, namely furniture, automotive, creative, tourism and plastics & composite.

The project aspires to build a prosperous, harmonious and sustainable nation and population, maximising on STI. The success and realisation of this project also entails Science, Technology, Engineering and Mathematics (STEM) talents to be the key drivers of research, innovation and enterprise through transformative thinking and integrated actions.



Professor Emerita
Datuk Dr Mazlan
Othman

As the Project Director for Mega Science 3.0, Datuk Dr Mazlan has ensured that common futures are projected in all 15 sectors. In addition, she is spearheading the Malaysia Foresight 2050 study. The findings of this study and of Mega Science will be the launching pad and game-changer in achieving the aspirations set out. In the course of doing so, risks are simultaneously identified and the risk-management framework developed.

OUR EDUCATION SYSTEM

There is growing concern that our current education system may not be creating enough thinkers for the future. Datuk Dr Mazlan opined that to produce thinkers, both creativity and arts must also be encouraged. Building knowledge on STEM alone is insufficient and there should also be the inclusion of arts and culture to make the system holistic. Japan, France and Italy are among countries in which the element of culture is very strong and ingrained in their education systems. Innovation comes from creativity and unless creativity is consciously and structurally encouraged and motivated in schools, a country may continue to produce generations of workers, not thinkers. The nation may lose out in building its long-term competitive edge because of the lack of thinkers. She advocated that our education system teach students how to think and to have foresight.

On another concern, while Malaysia may have the facilities and human resources, it is equally pertinent to invest in technology, lest good talent leaves. Without structured programmes and with the absence of aspirational targets, the best minds will ultimately leave. This will subsequently create a gap and impair our capability and capacity. Often an industry is sustainable only when people are intrigued and inspired by big and noble goals, some bigger than themselves or their companies.

BIGGEST CONCERNS

One of Malaysia's handicaps is the lack of relevant data to form the basis for policy making. For example, while a goal for 60% of students to go into

STEM has been set at university level, we subsequently find that barely 10% are qualified to go into the Science stream in the first place. There is an anomaly of prevailing pre-requisite requirements against the policy, an area that should have been re-examined had there been sufficient data. Research culture must be instilled and made as an agenda towards formulating realistic and achievable goals.

As for the prevailing decline in STEM enrolment which is phenomenal in Malaysia, several factors have been found to contribute to this. They include:

- Science is not taught interestingly enough to attract students in schools.
- Remunerations and rewards for a scientist and retaining scientists must commensurate with effort; promotion to administrator's role is thought to be the only route to better remuneration and in the course, the best minds are no longer retained for their science roles.
- A new generation is brought up to expect instant gratification, while science is known to require rigorous thinking, time-consuming research processes and often slow discovery before reward is recognised.
- There may simply be insufficient career opportunities in science and one will not embark on any discipline if statistics show there are few job prospects in it.

An individual will typically take 12-16 years to complete his/her education prior to entering the workforce. Education policies must be formulated to take this into consideration. Malaysia's demography indicates strength in our young population and our leaders need to be forward-thinking and visionary in motivating this young generation in preparing the country for the future.

UNIVERSE VS MULTIVERSE

Datuk Dr Mazlan introduced the concept of "multiverse" as opposed to "universe", taking the word "multi" to a higher level. She prompted me

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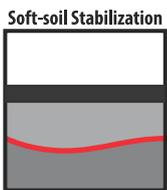
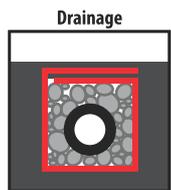
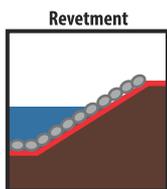
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to imagine that the Universe we observe, from end-to-end, as a drop in the cosmic ocean (which I did, but my simple mind seemed incapable of perceiving such).

Beyond what we can see and observe, there is more space, more stars and more galaxies for innumerable billions of light years farther than we will ever access. Further on there are, again, infinite more Universes similar to this. Our universe is believed to be at least 10 billion light years in diameter and to contain a vast number of galaxies; it has been expanding since it was created in the Big Bang about 13 billion years ago. This concept of multiverse is simply overwhelming and equally daunting to my earthling mind.

Space travel is another topic that fascinates Datuk Dr Mazlan. She relates the discovery of water on the planet Mars, indicating the possibility of lifeforms there. But apart from the anticipation of meeting Martians, the planet offers many amazing attractions like Olympus Mons, the mountain with a summit that reaches 25km into the sky and has a base measuring 600km in diameter and Valles Marineris, the Grand Canyon which is deeper than the Grand Canyon of the USA and spans the width of the US, coast to coast.

At the time this article was being written, the rare celestial phenomena of the super blue blood moon occurred on the evening of 31 January, 2018. Despite her busy schedule, Datuk Dr Mazlan took time to provide facts on the phenomena, the last of which occurred 150 years ago.

"Super moon" was because the moon was 14% bigger and 30% brighter due it being closest to Earth at that time, "blue moon" was because it was the second full moon within the same month, and "blood moon" was because it was a total lunar eclipse which gave the moon a red tint where the Earth sat between the sun and the moon.

MOST VALUABLE EXPERIENCE IN UN TENURE

At UNOOSA, Datuk Dr Mazlan took the lead in international co-operation

in space and co-ordination of space law among countries. When asked what the most valuable experience was during her tenure in the UN office, her reply was nothing celestial but simply the down-to-earth capability to exercise her diplomacy skills when dealing with so many nations, each with its own background, resources and local national agenda.

Her challenge was to keep abreast of each country's affair and to remain politically mindful in her course of facilitating, mediating and negotiating issues with the countries, in their best interests. The spectrum of the issues was astronomically large and the gap between each country often wide. "That is what the UN is about, a culture of 193 nations in the world," she said.

Datuk Dr Mazlan is also one who values diversity. Having worked in the UN, she is grateful to have collaborated with different people from various backgrounds and cultures and who speak in their own distinct languages. Diversity is Malaysia's strength and she advocated that we celebrate our differences and be optimistic for the country because of our diversity as compared to other countries which are homogeneous. Our diversity is what drives the country forward and forms the fundamentals of our progress.

HER PASSION NOW

In 2017, Datuk Dr Mazlan became Director of the International Council for Science (ICSU) Regional Office for Asia and the Pacific (ROAP), an organisation that promotes the development of science in Asia Pacific and aids in strengthening the voices of scientists within the region. ROAP is involved in programmes which include supporting regional efforts on natural hazards and disaster risks, sustainable energy and health & well-being in the changing urban environment. Datuk Dr Mazlan is leveraging on her leadership role in integrating natural and social science to address the challenges. She will also use this platform to create awareness of the importance of science in formulating policies.

She is also a visiting professor at the Permata Pintar Genome-to-Space

Program since 2017, Emeritus Professor at UKM, adjunct faculty at UPM and Senior Fellow at ASM. All these are avenues for her to give back to society.

CONCLUSION

No words can further describe the achievements of Datuk Dr Mazlan, our very own scientist who has attained great stature in the world of science. She is indeed our shining star in the multiverse. ■

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- [2] Community – PERMATA Pintar National Gifted Center [Online] available at <http://www.ukm.my> [accessed on 2 February, 2018].

Author's Biodata

Ir. Sharifah Azlina Raja Kamal Pasmah is the Executive Director & COO of HSS Engineers Bhd., specialising in Roads & Transportation and Infrastructure & Project Management.

IEM DIARY OF EVENTS

Title: 1-Day Seminar on Electromagnetic Compatibility (Emc) and Functional Safety

23 April 2018

Organised by: Electrical Engineering
Technical Division
Time : 8.30 a.m. - 5.30 p.m.
CPD/PDP : 7

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KL CONVENTION CENTRE



IEM Women Engineers Section will be hosting Women in Science, Engineering & Technology Conference (WiSET 2018) on 17-19 July, 2018, at Kuala Lumpur Convention Centre with the theme, Global Outlook of Women in Science, Engineering & Technology.

Ms. Gail Mattson, President of International Network of Women Engineers and Scientists (INWES) will be the main keynote speaker for WiSET 2018. She is a registered professional engineer with over 30 years involvement in advancing women in STEM at the Society of Women Engineers, United States. She is also founding member of INWES and the INWES Education and Research Institute.

Conference attendees will have the opportunity to hear the insights of some of the leading women in STEM. The plenary sessions features women leaders, experts and change makers in industry, academia and government. The panelists include Ms. Valerie Agberagba, Chairperson of Women in Engineering Standing Committee of World Federation of Engineering Organisations (WFEOs), Prof. Dato' Dr Noraini Idris, Chairperson of National STEM Movement and Deputy Vice-Chancellor (Research & Innovation) of Universiti Pendidikan Sultan Idris, Datin Paduka Ir. Dr Siti Hamisah, Director-General, Ministry of Higher Education, Malaysia, as well as prominent speakers from Pertubuhan Arkitek Malaysia, Wanita Industri Binaan Malaysia and more.

The opening theme – Engage, Empower, Energise – will focus on leading tomorrow's women in STEM today and furthering their roles in technology to address today's pressing global issues. Dr Marcella Lucas, Business Development Director for International Ventures, LeadWomen, Malaysia, will be the moderator for WiSET. She delivers strategic initiatives to support the government's National Transformation efforts and is a member of The 30% Club which believes that gender diversity is good for the overall effectiveness of the boardroom and therefore, is good for business.

Featured speakers include:

- Datuk Ir. Rosaline Ganendra, Executive Director of Minconsult Sdn. Bhd.
- Dato' Sr. Lai Wai Seang, President of Royal Institution of Surveyors Malaysia.
- Ir. Sharifah Azlina, Executive Director and Chief Operating Officer of HSS Engineers Berhad.
- Ms Rohaida Ali Badaruddin, Chief Executive Officer at Scomi Engineering Bhd.

The conference will have many exciting programmes and will feature new and exciting track presentations, addressing key topics such as the 4th Industrial Revolution, women empowerment, women in sustainability community, sustainable technology & innovation, globalisation and industrial development.

For registration and further information, please visit
<http://www.myiem.org.my/news/newsdetails.aspx?id=447>

A Rose Among Thorns in Aircraft Maintenance



Emira Junita binti
Abdullah

The Malaysian aviation industry is highly male-dominated. However, this has not deterred Puan Ainun Abdul Jalil from entering this exciting industry. She is one of the few experienced Licenced Aircraft Engineers and she also holds a Bachelor of Engineering (Aerospace) from Universiti Putra Malaysia.

Puan Ainun chose aviation because of a desire to challenge herself to do something different. She wanted to show that women can be as competent as men in a male-dominated field.

After completing her degree in Aerospace Engineering, Puan Ainun found that the local industry was more focused on airline services. The situation forced her to re-examine her career path and that led her to be a licenced aircraft engineer.

"The local industry is more geared towards airlines industries rather than manufacturing. There is more opportunity for work in the airlines industry, specifically aircraft maintenance. Basically, to be an Aircraft Maintenance Licence (AML), you need the licence. Maintenance personnel cannot carry

out maintenance work on airplanes/helicopters without a licence from the authorities," she says.

"Malaysian civil aviation is governed by the National Aviation Authority or Department of Civil Aviation Malaysia (DCAM). All the requirements and qualifications for an AML are defined in the Malaysia Civil Aviation Regulation (MCAR) and DCA Airworthiness Notice (AN). This was why I decided to further my studies in the Aircraft Maintenance Engineer Licence programme."

Puan Ainun is experienced in two different types of aircraft maintenance: Maintenance, repair & overhaul (MRO) and line maintenance. Both have different challenges and exposures but the responsibilities are similar. The job of the Licenced Aircraft Engineer (LAE)

is to certify maintenance work, such as to carry out inspection, repairs and troubleshooting for defect rectification on aircrafts. The LAE supervises a group of mechanics working on the aircraft by giving them instructions and guidelines to complete the task. The LAE is also responsible for inspecting the task/job done and will provide certification (Certificate Release to Service) to declare that the aircraft is airworthiness compliant and ready for the next flight.

At present, women face various challenges in the aircraft maintenance industry. "I believe men and women complement each other in the workplace. Initially, it may be hard to gain the workers' trust and change their perception. In their opinion, heavy industries like aviation are not suitable for women. However, when you show that you're good at your work, they will eventually support you. Besides, women have an advantage when it comes to certain tasks because of their relatively smaller and more flexible hands, for example task involving aircraft wings and the fuel tank. Women also tend to be more meticulous, for example in discovering small cracks in the aircraft engine during checks and installing bolts. In these situations, women have the upper hand."

A good support system is vital for women to feel accepted in this field. "I have many male mentors who are my batch mates. We support each other. I was also inspired by a female apprentice from one of the MRO who I worked with. She guided me on how to survive in this male working environment."



Maintenance works



Group photo session

Her team leader, Encik Azizhadi bin Yaakop, agrees on the critical need for convergence and inclusion. "In the modern engineering world, men need to be the confederate for women and minorities to create an environment in which everyone can be tranquil, in order to realise true inclusion. This will benefit particularly the growth of the aviation industry through diversity which further supports the inclusion of a female workforce as part of the team by encouraging different perspectives and ideas that drive innovation and creativity."

He feels that the aviation industry can do more to encourage diversity. "The rapid growth of the industry demands that we face challenges within the system. We must also challenge the typecast prejudice that still pervades our society, particularly in engineering. Attracting and retaining a more diverse workforce will maximise the potential of the aviation world via transformation, innovation and competitiveness," he says.

In recent years, more Malaysian women have shown an interest in aviation and this is reflected in the increase in the number of female aerospace engineers. However, continued effort is required to attract and retain women. "Many young people have little understanding of what engineers actually do. There are greater opportunities now than previously. Part of today's problem is the lack of visible role models.

I believe that if young women are continually exposed to successful role models in the industry, more will believe that non-traditional roles are suitable for them too. Women need to be more confident in their abilities and to improve their networking skills. It is harder for them in environments such as aviation/aerospace where they are vastly outnumbered, but effective networking is vital to help them make that career move," he added.

The aviation industry has always been spearheading new technology. When asked about the impact of the digital revolution, Puan Ainun says aviation is one of the earliest industries affected. "The aviation industry has a history associated with leading-edge technology, increasing levels of efficiency and safety and massive expansion of its services. The adoption of digital application in the aircraft system such as "fly-by-wire" in the flight control system and "glass cockpit" to replace the traditional analogue electro-mechanical instrumentation will benefit maintenance personnel. The integration of digital technology such as computerised equipment in the cockpit will make our maintenance job easier by giving alert and warning data for early fault detection and increasing the accuracy in troubleshooting. Besides, computerised components also means reducing/replacing major mechanical components, leading to less maintenance work. This will

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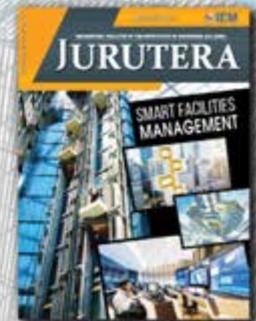
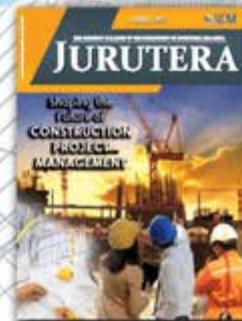
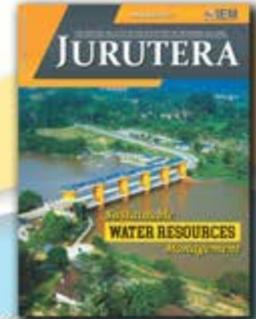
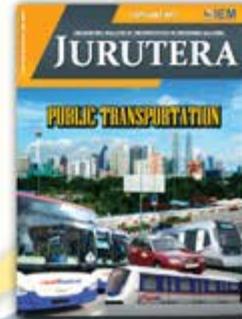
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benefit maintenance personnel and the industry in terms of man-hours and maintenance costs."

Though the aviation industry can be extremely challenging for women engineers, it can also mean an exciting, satisfying career. Puan Ainun says: "The fun part of my job is when I have to work under tight schedules and constrained resources. It challenges me to achieve the targets and goals while keeping me motivated."

The aviation industry will surely benefit from having a diverse workforce, so more should be done to promote diversity and encourage inclusion in the industry. "It is the availability or lack of information and visibility that makes all the difference. Many international companies exercise policies for equal and open opportunities without gender discrimination. Airbus is a model example of how commercial enterprises can support female entry into the industry," says Puan Ainun. ■

Author's Biodata

Emira Junita binti Abdullah is senior lecturer and researcher at the Department of Aerospace Engineering, Universiti Putra Malaysia.

IEM DIARY OF EVENTS

Title: Technical Visit to Drilling Tools Manufacturing Plant

24 April 2018

Organised by: Oil, Gas & Mining
 Technical Division
 Time : 9.00 a.m. - 1.00 p.m.
 CPD/PDP : Applying

Title: Talk on "Selection of Engineering Design Option in Floods Mitigation Projects"

28 April 2018

Organised by: Water Resources
 Technical Division
 Time : 9.00 a.m. - 11.00 a.m.
 CPD/PDP : 2

Title: Technical Talk on "Railway Power Supply and Distribution (PS&D) System"

3 May 2018

Organised by: Engineering
 Education Technical
 Division
 Time : 5.30 p.m. - 7.30 p.m.
 CPD/PDP : 2

Title: Technical Visit to TNB Integrated Learning Solution Sdn. Bhd. - ILSAS

3 May 2018

Organised by: Electrical Engineering
 Technical Division
 Time : 9.00 a.m. - 1.00 p.m.
 CPD/PDP : Applying

Title: 2-Day Course on "Plumbing"

3 May 2018

Organised by: Building Services
 Technical Division
 Time : 8.30 a.m. - 5.15 p.m.
 CPD/PDP : Applying

Title: 33rd EETD Annual General Meeting

5 May 2018

Organised by: Electrical Engineering
 Technical Division
 Time : 11.00 a.m. - 1.00 p.m.
 CPD/PDP : Applying

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PFLNG1 Project – A Massive Gas Plant Complex That Sails



Ir. Roslin Ramli

Petronas is a Global FORTUNE 500 oil and gas major in integrated petroleum operations with over 50,000 employees comprising more than 100 nationalities. Backed by 42 years of solid reputation as owner, operator and regulator in domestic operations as well as partnerships and operatorships on the international front, Petronas now runs the world’s first Floating Liquefied Natural Gas (LNG) facility and is a technology leader and leading LNG player.

As one of the world’s largest LNG producers, it operates one of the largest LNG facilities in a single location in Bintulu, and owns the largest LNG fleet in the world, with an unblemished delivery record of close to 10,000 LNG cargoes to 75 LNG terminals in more than 26 countries. With more than 100 Production Sharing Contracts under its belt, Petronas is experienced in exploration, development and production of crude oil and natural gas in Malaysia and abroad. Other scopes include.

- liquefaction, sale and transportation of LNG.
- processing and transmission of natural gas and the sale of natural gas products.
- refining and marketing of petroleum products.
- manufacture and sale of petrochemical products, trading of crude oil, petroleum products, and petrochemical products and
- shipping and logistics relating to LNG, crude oil and petroleum products.



Figure 1: PFLNG1 Construction Aerial View

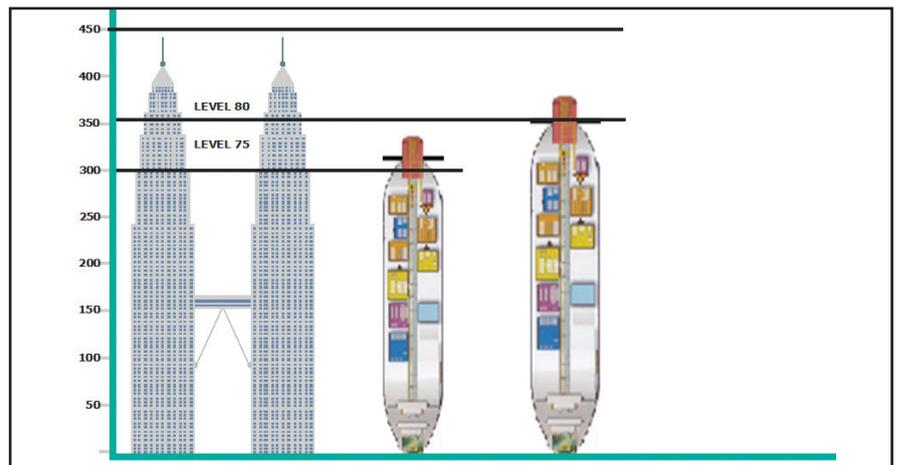


Figure 2: Physical Dimension of PFLNG1 & PFLNG2

The fast track nature of the project presents a challenge to the upstream gas business in meeting the target date, especially in building a mega high technological structure like the FLNG (see Figure 2 for physical dimension comparison). Extensive technology selection exercises were conducted in finalising the turret mooring, gas treating, liquefaction, LNG cargo containment and LNG offloading systems.

Designers and licensors have done rigorous design optimisation and marinisation studies on impact of floater motion and

evaluated these against an extensive list of criteria. Marinisation is a process of design, redesign or testing of products specifically for use and long-term survival in a harsh marine environment. The design optimisation focused on the following:

- Proven and established onshore and offshore track records as well as experience or involvement in the delivery of LNG plants.
- Design robustness and acceptable efficiency.
- Operating envelop and flexibility.
- Inherent safe design.

BACKGROUND

The Petronas Floating LNG concept was envisaged to monetise stranded gas resources. FLNG is a facility custom-built as a vessel to liquefy, produce, store and offload LNG. It plays a significant role in efforts to unlock gas reserves in remote and stranded fields deemed uneconomical to develop and evacuate. The two floaters, PFLNG1 and PFLNG2, for offshore Sarawak and Sabah respectively will increase the country’s LNG production capacity by approximately 8% (2.5 metric tonnes per annum).



Figure 3: Lifting of the last pipe rack module

In addition to the design optimisation, lessons learnt from PFLNG1 were captured to ensure necessary improvement in the PFLNG2 design and operability aspects.

LIFTING OPERATION

PFLNG1 Constructability Review (CR) was performed prior to the lifting operation of each topside module onto the hull section. Like a giant jigsaw puzzle, various pieces of the topside modules were preassembled and construction of the superstructure involved the installation of the large and heavy equipment such as process columns, flare, turret, gas-turbine package, electrical and instrumentation building. Topside modules integration was controlled and checked by the construction engineering and quality management team.

The hull stability, weight control report and stresses of both structures (hull and topside modules) and their sub-components, including the temporary support, lifting lugs and the erection aids, were analysed to ensure accuracy.

For pipe rack erection and topside module lifting, centre of gravity (COG) and hull stability analysis were carried out while for safety lifting operation, job safety analysis (JSA) was approved and carried out in accordance with shipyard floating crane operation and lifting safety procedure.

STRUCTURAL HOOK-UP AND INTEGRATION

All topside modules were erected and lifted to the hull main deck and were positioned at the location of support stools. A laminated elastomeric bearing system was

attached to the underside of the modules during load-out and welded down to the support stools after topside module set-down.

PIPING HOOK-UP AND INTEGRATION

Pipe spools were routed between topside modules or between the piperack. When all topside modules were installed and erected on the hull, the hook-up spools acted as tie-in spools between topside modules and piperack. The hook-up spools were welded or bolted after the piping stringing and alignment arrangement were checked and, where necessary, an adjustable spools piece would be considered. After the hook-up spools were completed and installed, the piping hydrotest commenced as part of the integration phase activities on board (floater).

LESSONS LEARNT

From a mega project such as this, lessons learnt are of the utmost importance. More importantly, these lessons would be crucial to the success and efficiency of PFLNG2. Shipyard selection and work allocation inside or outside of the shipyard need to be "locked" or finalised with no changes allowed during the execution phase. Any change request can only be considered after risk assessment and change management approvals are obtained.

Piperack modules detailed engineering deliverables versus shipyard shop drawing (construction engineering) need to be aligned for early completion in order to meet the lifting sequence. Topside modules on ground erection and completion need to be determined by shipyard floating crane capability and availability. Preservation quality on the critical equipment and material needs to be continuously inspected and protected. The topside modules lifting sequence has to be established during the Constructability Review (CR) at the detailed engineering phase and the System Mechanical Completion (SMC) needs to be integrated between hull completion and topside modules completion.



Figure 4: PFLNG1 Topside Modules Construction

Simultaneous Activities (SIMA) Matrix needs to be established to ensure adequate controls are in place. SIMA is used when there is a conflict of interest in executing project activities at the same place, which may cause an adverse impact on Personnel, Environment, Asset and Reputation. This is to manage and execute the conflicting activities in a safe and effective manner by evaluating and identifying appropriate control measure in place to as low as reasonably practicable.

WORLD'S FIRST

The success of the PFLNG1 Project was a remarkable accomplishment in marine construction technology and engineering advancement. It was not just an achievement for the local and international engineering industry but also an accomplishment for Malaysia as a country on its way to become a developed nation in 2020. On 5 December, 2016, Petronas achieved a world's first, successfully producing the first LNG drop from the PFLNG1 and delivering its first cargo a few months later. It is a megastructure of unconventional proportions, a technological marvel that has changed the landscape of LNG production forever. ■

SOURCES

- <https://www.petronasofficial.com/floating-lng/index>.
- IEM Talk, 11 November, 2017, "Construction of First Floating LNG in the world: PFLNG SATU Lessons Learnt" by Ir. Roslin Ramli.

Author's Biodata

Ir. Roslin Ramli is Head of Construction/Project Manager for PFLNG1 Project.

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Addressing Significance



by Ir. Shum Keng Yan

Ir. Shum Keng Yan is a chemical engineer and a certified accident prevention and safety practitioner.

In the previous article (February, 2018), we discussed how Unsafe Behaviour is inherently rewarding. In many cases the Significance, Timing and Consistency are "+", thus reinforcing Unsafe Behaviours.

So how can we reverse the perception?

The adverse "Significance" outcome from Unsafe Behaviour needs to be experienced so that we will make the right choice to be safe. Can we experience "adverse outcome" during training without getting hurt?

FELT ENVIRONMENT

Let us look at creating a "felt environment". The classroom training on the outcomes of cut, slip/trip/fall, chemical exposure and electrical shock will just create Awareness (refer to the "3As to Gaining Ownership – October 2015", which is part of the "Engagement Safety" series). This will not be sufficient to make us want to avoid the outcomes as it is rather remote and quite theoretical. We may, perhaps, feel some Acknowledgement though this depends on the experience.

It is important that we feel the outcomes in a "safe" way. Some training providers use Virtual Reality to create the "felt environment". In a simpler way, we can create the hazards in a technical training centre where we will experience the various outcomes as part of the training. A "felt environment" will allow us to understand the Significance of our behaviour at a higher level.

FELT IMPACT

Another way to drive home the message of Significance of an outcome is to show how daily routines change after a serious event. Create simulations of, for example, performing daily actions with the loss of finger or limb. The reaction of the family towards these adverse outcomes will play a major role in engaging us to be safe. In many safety awareness campaigns, the family element is brought in to create the engagement with loved ones.

Next: Timing and how it affects our thinking when making a choice.

Share the Significance of your own examples at: pub@iem.org.my.

"Whatever you do will be insignificant, but it is very important that you do it." Mahatma Gandhi. ■

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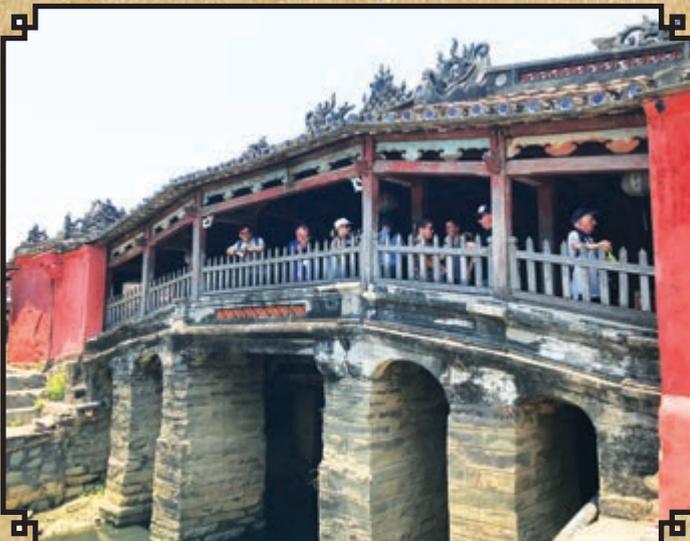


Contributed by
Ir. Razak Yakob



Japanese Bridge Link in Vietnam

The Japanese Covered Bridge is located in Hoi An, a small, old touristic town in Vietnam's Quang Nam Province. The beautiful intricate Japanese architecture was said to be built by the Japanese community living in Hoi An in the early 17th century. Hoi An is recognised as an example of a well-preserved trading port in South East Asia, dating back between 15th to 19th century. ■



Step Right Up for a STEM Experience

WOMEN ENGINEERS SECTION

reported by



Ir. Mah Siew Kien



Puan Noorfaizah binti Hamzah

STEM Women Engineers Section is committed to supporting STEM education and to encourage public analysis, debate and awareness on the serious decline in interest in STEM education. After all, the quality of STEM education in Malaysia is a magnet for foreign investments in the country.

On 13 January, 2018, Ir. Mah Siew Kien, Ir. Hajah Rosnelawati, Puan Najihah and Puan Noorfaizah participated in the *Jom Masuk Aliran Sains* forum organised by the National STEM Movement (NSM) at Perbadanan Perpustakaan Awam Selangor (PPAS) Raja Tun Uda, Shah Alam. The forum brought together parents, teachers, students, university professors, PIBG representatives, government, industry and three distinguished panelist who spoke on the importance of STEM education, the challenges and how to ensure it was elevated to national priority.

Mr. Ramesh Pillai, Executive Secretary of MACRI, highlighted that STEM students enjoyed higher chances of enrolment in public universities and of securing jobs with better remunerations after graduation. For the STEM Mentor Mentee Programme initiative, NSM acts as facilitator for university students to mentor Form 1-3 students in schools so as to fire up their interest in STEM subjects. Teaching methods such as inquiry based learning and experiential based learning will make the study of science more alive and interactive.

NSM Chairperson Prof. Dato' Dr Noraini Idris stressed that STEM has never been more important as now, when technology and innovation have grown at an exponential rate. The global technology economy is currently valued at US\$6 trillion and robots are expected to take over 30% of all jobs by 2025.

She is concerned that Malaysia is poorly positioned to face this new world order, known as Industrial Revolution 4.0. Locally, skilled STEM workers make up only 0.7% of the total current workforce whereas globally, it's about 30%. Globally, the number of STEM occupations is growing faster than non-STEM occupations and STEM careers paid, on average, 29% more in salaries but this trend has not caught on here.

Malaysia also hopes to achieve a ratio of 60:40 for children interested in STEM as compared to non-STEM education and careers. Dr Ihsan Ismail from the Ministry of Education talked about the government's commitment and efforts to strengthen the delivery of

STEM across the education system. The strategies are aimed at enhancing the interest of students via a new learning approach, strengthening the curriculum and combining the higher order thinking skills in teaching and learning.

The influential Pisa rankings have ranked Singapore, which only gained independence in 1965, as having the highest-achieving primary and secondary pupils in international education tests in maths and science.

To inspire students to take up engineering, Dato' Noraini invited Ir. Mah Siew Kien to take the floor. Persistent stereotyping and the lack of understanding about the engineering profession still held true as a student excitedly remarked that Ir. Mah did not look like an engineer. Engineering today is an incredibly diverse industry and is more about a rise in digital careers.

On 7 February, an IEM team led by Puan Noorfaizah participated in STEM On The Move, an event spearheaded



Jom Masuk Aliran Sains forum at PPAS Tun Raja Uda



STEM Carnival at SMK Sri Andalas

by Sekolah Menengah Kebangsaan Sri Andalas, Klang. The event was full supported by neighbouring schools such as Sekolah Menengah Kebangsaan La Salle, Sekolah Menengah Kebangsaan Bukit Tinggi and Sekolah Menengah Kebangsaan Klang Utama.

Approximately 320 students (Forms 4 and 5) from these schools took part in the one-day carnival which had programmes such as exhibitions on biology, physics and chemical subjects. There were also hands-on activities conducted in various laboratories and workshops for Mathematics and Technology implementation. These included animal anatomy exploration, sirpuloh activities, robotic and windmill shows.

Besides these, another highlight was a competition organised by IEM in which students were given 2 hours to produce a 3D model using fully recyclable materials provided. The built model had to fulfill the criteria of basic science, technology and engineering principles. The purpose of this programme was to grow research and development activities among the school students in order to fulfill IEM's corporate social responsibility.

It also helped to encourage the students' creativity and boosted their interest in engineering subjects as well as increased networking and establishing a way for IEM to hold more collaborative programmes with other government agencies. In conclusion, the programme was a success and it had been suggested for implementation in the school teaching module. Carried out regularly, such programmes can be a step to produce more potential graduates and professionals in engineering.

Malaysia is now at the crossroads where it can either become a shining success as a developing nation or fall into the middle-income trap. To ensure our nation's survival, let's help create the much-needed 2.1 million STEM workforce by 2025 and 8 million by 2050. ■



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WE-AFEO Smiles at CAFE035... Till We Meet Again In Wiset 2018

WOMEN ENGINEERS SECTION

reported by



Ir. Mah Siew Kien

WE-AFEO women engineers came together at CAFE035 in the "Land of Smiles" from 16 to 18 November, 2017. The annual event is held to promote goodwill, understanding and cooperation as well as to exchange ideas and experiences in the fields of education, science, engineering, technology, environment, human resource, training and registration of professional engineers.

CAFE035 was held at Queen Sirikit Convention Centre in Bangkok.

WE-AFEO was formed in 2013 to promote understanding, goodwill, cooperation and to empower women engineers in ASEAN countries.

During the country report segment, each WE-AFEO country representative reported activities and achievements which ranged from successful conferences, technical talks and even creative activities. One of the unconventional activities reported was a virtual race by IEM Women Engineers Section, in which participants mapped their own

race routes, for example in their neighborhoods, local trails, track or even on a treadmill and then reported their participation online.

An amazing Lakambing Inhinyera 2017 was held for the first time by The Philippines Technological Council to celebrate gorgeous women engineers and, at the same time, to help them build courage, confidence, passion and realise their full potential. As women engineers usually wear pants and little make-up, it was a rare occurrence to see them on the



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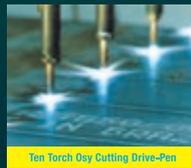
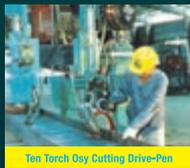
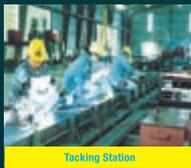
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catwalk in evening gowns, corporate attire and even PPE coveralls.

Many countries also highlighted their humanitarian activities such as providing assistance to victims of flood and landslide disasters.

WE-AFEO delegates also visited Jim Thompson House, the former house of a pioneer silk tycoon and CIA agent who settled down in Thailand after World War II but disappeared while hiking in Cameron Highlands. Thai silk is produced from the cocoon of Thai silk worms. It was interesting to see weavers hand-reel the silk threads onto a wooden spindle to produce raw silk at Jim Thompson House.

At the closing ceremony, CAFEO35 delegates were treated to a truly captivating traditional Thai dance by WE-AFEO women engineers. The beautiful smiles and graceful movements reflected the Thai culture of hospitality, compassion, gentleness, fun-loving, open-mindedness and laid-back attitude.

CAFEO35 marks another step forward in a building a diverse and inclusive work environment for engineers. Year 2018 has been declared Women Empowerment Year in Malaysia. IEM Women Engineers Section is honoured to be hosting the 2nd International Conference of Women in Science, Engineering and Technology Conference (WiSET 2018). The theme of the conference, Global Outlook of Women in Science, Engineering and Technology, explores new horizons, challenges and opportunities for women in the future.

The highly-anticipated event will be held at the Kuala Lumpur Convention Centre from 17 to 19 July, 2018, in conjunction with ASEAN's Premier Mechanical and Electrical Engineering Show 2018. It will feature speakers with diverse background and representations such as Ms. Gail Mattson, President of International Network of Women Engineers and Scientist (INWES), Eng. Valerie Agberagba, Chairperson of Women in Engineering Standing Committee of World Federation of Engineering Organisations (WFEO), Prof. Dato' Noraini Idris, Chairperson of Malaysia's National STEM Movement, Datin Paduka Ir. Dr Siti Hamisah, Deputy-General of the Ministry of Higher Education (Malaysia), Sr. Dr Hj Wan Maimun, President of WIBM, Dato' Sr. Lau Wei Seang, President of RISM, guest moderator Dr Marcella Lucas from Lead Women and more.

A strategic approach for inclusiveness, wellbeing and diversity in engineering is important to harness the full potential of women engineers.

An increased participation of women in the workforce is important as Malaysia edges its way towards becoming a developed nation where all citizens can contribute to its success. Let's position 2018 as the year of opportunities for the advancement and empowerment of women engineers! ■

IEM WE Section Pre-AGM Talk on “Overcoming the Challenges of Gender Imbalance in the Engineering Industry”

WOMEN ENGINEERS SECTION

reported by



Puan Najiha binti Nadzru

The Women Engineers Section organised a pre-AGM talk on 23 September, 2017, which attracted a good turnout of over 40 participants. The event, Overcoming the Challenges of Gender Imbalance in the Engineering Industry, was presented by Puan Najiha binti Nadzru of Ranhill Bersekutu, Puan Noor Faizah Hamzah of Universiti Teknologi Mara (UiTM) and Ir. Suhana binti Abdul Majid, Managing Director of Prestasi Perintis. The session was chaired by Datin Sri Ir. Nor Asiah binti Othman of Jabatan Kerja Raya (JKR).

Puan Najiha began the session with her views on gender imbalance in the engineering industry. She shared that while working as a contractor, she was the sole local female engineer apart from another female engineer from

Europe, out of a total of 40 engineers. As the company expanded over the years, a second female engineer was recruited, but only 4 years later. In recent years however, the number has increased, amidst growing interest and awareness on the importance of diversity globally.

She discussed the different problems faced by women engineers as compared to men and shared her ideas on how to increase the number of women engineers. This was to create greater awareness in order to get more support from society, government and industry for better work-life-career balance.

The next speaker, Puan Noor Faizah Hamzah, presented an academician’s point of view of the number of female versus male students in the Faculty of

Civil Engineering, UiTM. The academic performance of female students was found to be consistently higher than that of male students; however additional studies were needed to ascertain the number of female civil engineering students who actually practise engineering after graduation. Many women also dropped out of engineering career along the way to raise a family or to care for ageing parents and this is reflected in the even lower number of professional women engineers.

The third speaker, Ir. Suhana binti Abd Majid, spoke about the qualities that would help women engineers to excel. She shared her personal experiences in balancing work and family life while working as a site engineer for more than a decade, before she became the director of her own company.

The last and only male speaker of the day, Ir. Dr Tan Chee Fai from Universiti Teknikal Malaysia (UTEM), shared his thoughts on the contributions and impacts made by women engineers although there are, at present, only a small percentage. During the Q&A session, a male engineer confessed that he was one of those who voted against the setting up of IEM Women Engineers Section a few years ago as he did not think there was a need or relevance as such.



Group photo session

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The speaker presenting the talk

Ir. Suhana highlighted that the engineering fraternity in general must understand and address gender imbalances proactively as intervention is needed because of market failures and social externalities that have failed to integrate more women engineers into the workforce over the years.

To realise the power and potential of the female workforce today, society needs to recognise the strategic importance of women in business transformation and growth while stepping up its commitment to diversity and inclusion.

In summary, there is still a large gap in terms of gender imbalance in the engineering industry. From the talk, the IEM WES committee hopes to create greater awareness that diversity and inclusion are important as we work towards a better future and a stronger nation. ■

IEM DIARY OF EVENTS

Title: 2-Day Project Risk Management - Qualitative & Quantitative Approached

7-8 May 2018

Organised by: Project Management Technical Division

Time : 8.30 a.m. - 5.30 p.m.

CPD/PDP : Applying

Title: 2-Day Course on Effective Engineering Problem Solving and Decision-Making

7-8 May 2018

Organised by: Oil, Gas & Mining Technical Division

Time : 8.30 a.m. - 5.30 p.m.

CPD/PDP : Applying

Title: 1-Day Seminar on Power Distribution in Buildings

10 May 2018

Organised by: Electrical Engineering Technical Division

Time : 8.30 a.m. - 5.30 p.m.

CPD/PDP : Applying

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IEM DIARY OF EVENTS

Title: ICTSIG Digital Class (May 2018) - Python Programming Language (Part 5 Numpy II)

12 May 2018

Organised by: Information and Communications Technology Special Interest Group

Time : 11.00 a.m. - 1.00 p.m.

CPD/PDP : 2

Title: ICTSIG Junior Digital Class (May 2018) - S.T.E.M Fun Learning: Introduction to Physical Computing and Software Development

16 May 2018

Organised by: Information and Communications Technology Special Interest Group

Time : 9.00 a.m. - 5.30 p.m.

CPD/PDP : N/A

Title: MRT Maintenance Depot, Prasarana Sungai Buloh (Siemens Inspiro Service and Maintenance)

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Disaster Preparedness Month

DISASTER RISK REDUCTION ADVISORY BOARD

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An evening talk on Disaster Preparedness Month was held in conjunction with the National Preparedness Month (*Bulan Kesiapsiagaan Nasional, BKN*). The talk on 31 October, 2017 was by Ir. Loo Chee Kin, Chairman of DRRAB and supported by committee member Encik Azahari bin Rejab; the special invited speaker was Encik Ahmad Fairuz bin Mohd Yusoff, Principal Assistant Secretary of Selangor's Disaster Management Unit (DMU). About 50 IEM members as well as several non-engineers attended the talk.

En. Ahmad started the evening talk by presenting the role of the DMU and the assets that Selangor has for disaster management and mitigation. He also shared several drone videos. The use of drones has helped the DMU and the other government agencies in disaster investigation, planning, response and management. As part of the Smart Selangor programme, DMU has several monitoring terminals

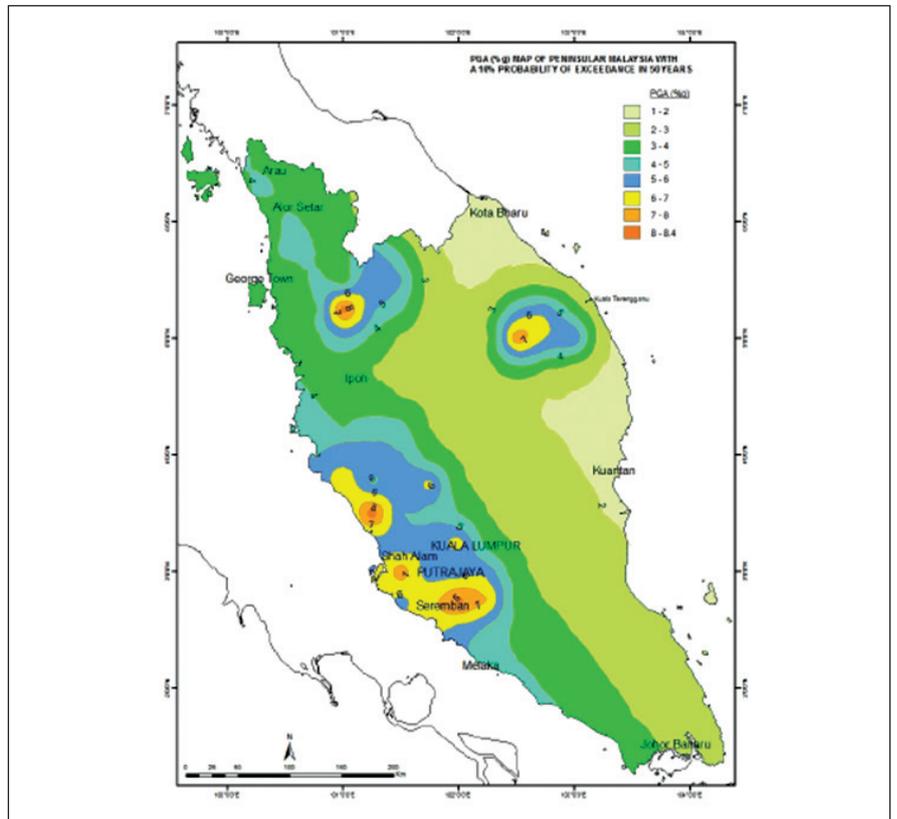


Figure 1: Draft Seismic Map for Peninsular Malaysia



Group picture of the speakers and some of the audience

in Plaza Perangsong to monitor weather, rivers, air pollution, etc.

Ir. Loo presented several engineering updates on the Kelantan Big Flood (2014), Flood Forecasting, Earthquake and Hillslope Risk Mapping. In the 2016 paper by *Nor Eliza Alias, et al.*, the 2014 flood in Kelantan was caused by two phases of heavy rainfall. From 15 to 19 December, the daily rainfall was 300 mm and this increased to 500 mm from 20 to 24 December. The rainfall during these periods was with Annual Recurrence Interval (ARI) of more than 500 years and broke a few past records.

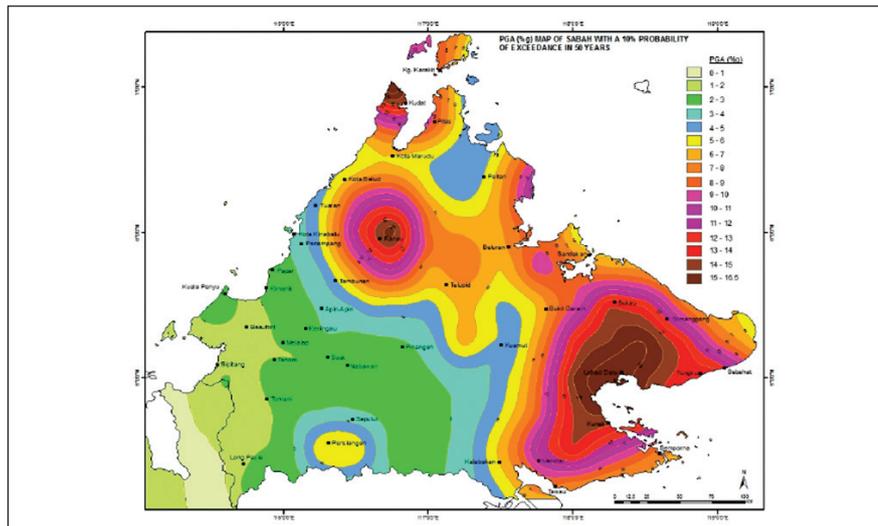


Figure 2: Draft Seismic Map for Sabah

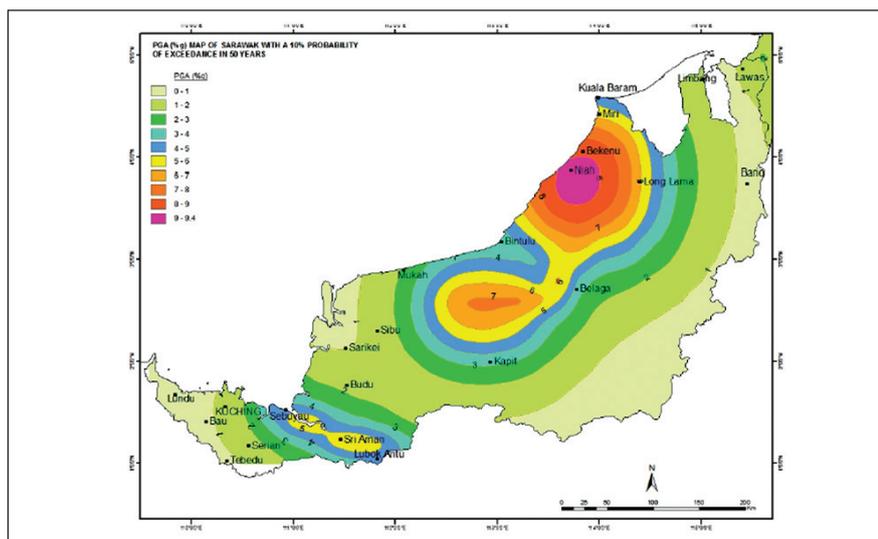


Figure 3: Draft Seismic Map for Sarawak

The great national flood, from 14 December, 2014, to 10 January, 2015, affected eight states: Kelantan, Terengganu, Pahang, Perak, Perlis, Johor, Sabah and Sarawak. It was a prolonged flood as water stayed in some area for more than 15 days. The estimated flooded area was 11,500 sq. km. and areas were inundated by 1-12 m of water.

As part of the efforts by the government to better forecast and prepare for floods, the National Flood Forecasting and Warning Program (PRAB) started in 2015. It provides flood forecast 7 days in advance and 2 days for flood warning, an improvement from the previous one day and 6 hours respectively. The first phase of PRAB has been completed and covers Sg. Kelantan,

Sg. Terengganu and Sg. Pahang river basins. The current phase covers 29 river basins. The final phase will be the remaining 8 river basins and is expected to be completed by 2022. More information can be found at <http://h2o.water.gov.my/>.

IEM DRRAB made community efforts ahead of the 2017 year-end coastal flooding on the west coast and IEM helped to prepare an information booklet. En. Azahari said the booklet explained the cause of coastal flooding, how the time and water level can be predicted, why such flooding can be exuberated, the expected water level, levee protection and how the levee can be compromised. The booklet was distributed to the Selangor District Offices on 20 September, 2017 as part

of the tidal flooding preparedness briefing package. It also contains a checklist for early preparation and steps which can be taken just before coastal flooding, during the evacuation and after the flood.

Malaysia had taken the first step to address the seismic risk for buildings by adopting the Eurocode 8 as MS EN 1998-1: 2015. The second step was writing the Malaysia National Annex for these codes. The draft predicted peak ground acceleration (PGA) from the annex is shown in the accompanying maps. The predicted PGA maps as prepared by Jabatan Mineral dan Galian (JMG) shows Sabah to have the whole spectrum of PGA value, which is 1-16.5% g. Known active areas like Lahad Datu, Ranau and Kudat have PGA values greater than 12% g (0.12g). Sarawak's highest PGA is 9% g (0.09g), located in the Niah area. In the peninsula, a few areas in Selangor, Negeri Sembilan, Perak and Terengganu, have the highest PGA. Once this annex is published, there will be many more steps to be engineered, such as drawing up standards or guidelines for seismic precautions for mechanical and electrical services as well as preparedness plans.

The other national project by JMG is the National Geospatial Terrain and Slope Information System (NaTSIS) to provide information on the dangers and risks of slopes. This will help local authorities in land use, planning and development control. About 1,350 sq. km. of selected areas in the highlands of Selangor, Cameron Highlands, Ipoh, Kota Kinabalu and Kundasang have been mapped under NaTSIS. (<http://www.natsis.jmg.gov.my/>)

In closing, Ir. Loo said the talk by DRRAB was to help engineers understand better the latest information on disaster risk. He hoped engineers will use the latest information for risk assessment, prevention, mitigation, design, construction and installation.

The talk was repeated on 20 December, 2017, at IEM Penang Branch and attended by 30 engineers. ■

JURUTERA

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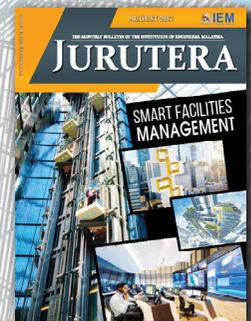
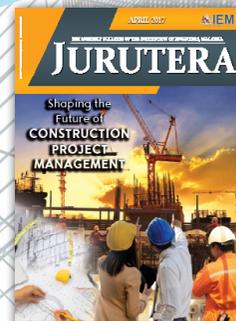
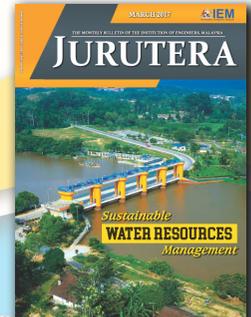
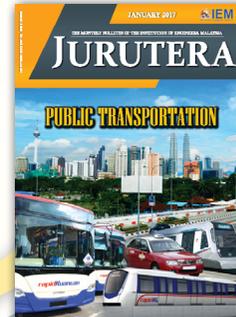


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The Saint Who Bathes Once Every 12 Years



Ir. Chin Mee Poon | www.facebook.com/chinmeepoon

Ir. Chin Mee Poon is a retired civil engineer who derives a great deal of joy and satisfaction from travelling to different parts of the globe, capturing fascinating insights of the places and people he encounters and sharing his experiences with others through his photographs and writing.

Shravanabelagola is a long name, but it is actually just a tiny village in the state of Karnataka in southern India, approximately 48km south-east of the nearest sizeable town, Hassan.

My wife and I came to this village with our travel buddies at about 11 in the morning on 10 February, 2006, to find the erstwhile quiet streets full of people. A grand religious ceremony, the 86th Mahamastaka Abhisheka, was being celebrated here and in the surrounding areas over 12 days (8-19 February) and we had come specifically to take part in the celebration which happens only once in 12 years.

There are two hills in the village: Vindiyagiri and Chandragiri. After obtaining a pass from an office near the bus station, we joined the queue of devotees and tourists and climbed up Vindiyagiri.

At the top of the hill, the colossal statue of a stark naked man in a standing posture immediately caught my attention. In front of the statue was a huge platform erected for the occasion and many people had already taken up positions on it to wait for the ceremony to commence. My wife settled down in a strategic spot while I walked around with my camera, scouting for photography opportunities.

Scaffolding had been erected behind the statue and many devotees were climbing up this to pour pails of water over the head and shoulders of the statue. I went up to take some snapshots of the actions and the congregation, but did not join in to

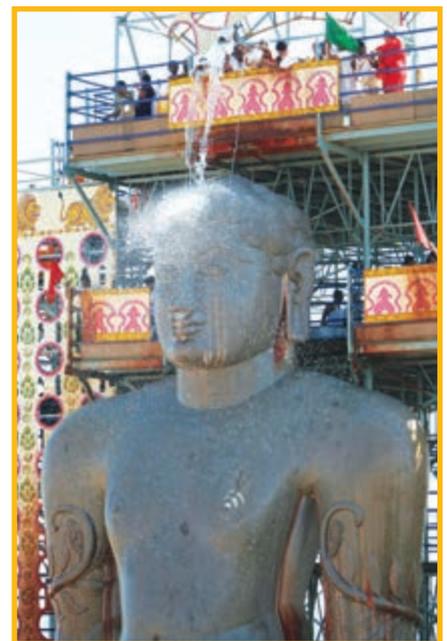
pour water over the statue because I was required to remove my belt before doing so.

The 18m-tall statue, carved from a single block of granite in the year 981 AD, is reputedly the tallest monolithic statue in the world. The image is that of a saint, Gomateshvara or Bahubali, the son of King Rishabdev of Ayodhya and the first Tirthankara of Jainism.

Jainism is a very old religion founded in 6th Century BC, about the same time as Buddhism. It is similar to Buddhism in several aspects, including the belief in the cycle of life, death and rebirth. A Tirthankara is believed to be able to guide devotees to break away from that cycle and attain complete enlightenment.

Unlike Buddhism, however, Jainism had not been able to spread its influence overseas and become a world religion. It remains a minor religion confined mainly to some parts of India. Shrvanabelagola is one of the most important pilgrimage sites of Jainism.

According to legend, King Rishabdev had two wives. The first wife gave birth to 99 sons and a daughter, while the second wife had only one son, Bahubali. When the children had grown up, the king decided to abdicate and go into the jungle to meditate. He divided his kingdom equally among his children to ensure they would live together peacefully but alas, his eldest son harboured the ambition to control all the land so he forced all his siblings, except for Bahubali, to surrender their little kingdoms to him.



A fierce fight ensued between the two brothers, ending with Bahubali lifting his sibling high above his head. But just when he was about to throw his brother down, he became overcome with a profound sense of remorse and despair. He gently put his brother down and disappeared into the jungle to meditate. He eventually became the first person in Jainism to achieve full enlightenment.

The official anointing ceremony began at 2.30 p.m. Pails of water were poured over the statue, followed by tamarind, milk, turmeric, sandalwood and pulverised sugar, turning the statue into one colour after another. There was music, singing and dancing after every round of anointment. The atmosphere was more like that of a festival than a solemn religious ritual. ■

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27857	YEONG KANG LOONG	BE HONS (USM) (CIVIL, 2007)
29103	RAYMOND HOR WAI KIT	BE HONS (UNITEN) (CIVIL, 2006)
44543	SITI AZURA BINTI MAT DAUD	BE HONS (UTM) (CIVIL, 2006) MSc (SHEFFIELD) (URBAN WATER ENGINEERING & MANAGEMENT, 2013)
22369	SARAH BINTI ISMAIL	BE HONS (MALAYA) (CIVIL, 2001) MSc (UKM) (CIVIL, 2014)
18050	NASEHIR KHAN BIN E.M YAHAYA	BE HONS (UPM) (CIVIL, 1989) ME (USM) (WATER RESOURCES & ENVIRONMENT, 2000) PhD (USM) (2010)
37032	FAIZ BIN HASSAN	BE HONS (UTM) (CIVIL, 2007)
KEJURUTERAAN ELEKTRIKAL		
95883	LIM CHAW YIH	BE HONS (UKM) (ELECTRICAL & ELECTRONICS, 2012)
50165	MUHD WAFI BIN SALEH	BE HONS (UTM) (ELECTRICAL, 2008)
56525	MARLENNY BT ALWI	BE HONS (UNITEN) (POWER ELECTRICAL, 2010) ME (UNITEN) (ENGINEERING MANAGEMENT, 2014)
59129	GOH WEI CHIUN	BE HONS (CURTIN) (ELECTRICAL, 2004) ME (CURTIN) (ELECTRICAL & COMPUTER, 2007)
KEJURUTERAAN INSTRUMENTASI DAN KAWALAN		
96037	ISMAIL BIN ABDUL RAHNI	BE HONS (ADELAIDE) (ELECTRICAL & ELECTRONIC, 2001)
KEJURUTERAAN GEOTEKNIKAL		
52436	JASON LIM AING HO	BE (MINNESOTA) (CIVIL, 2007) MSc (MINNESOTA) (CIVIL, 2011)
KEJURUTERAAN PERKHIDMATAN BANGUNAN		
47613	KAMAL DZULKHAIRIS BIN KAMAL ARIFFIN	BE HONS (NORTHUMBRIA) (BUILDING SERVICES, 2006) MSc (BRUNEL) (BUILDING SERVICES ENGINEERING WITH SUSTAINABLE ENERGY, 2010)
KEJURUTERAAN STRUKTUR		
24072	LIEW CHAI YUNG	BE HONS (MALAYA) (CIVIL, 2007)
51263	RAYMOND CHUNG KAH HOE	BE HONS (UPM) (CIVIL, 2010)
21249	WONG KANG CHEAN	BE HONS (UTM) (CIVIL, 2003)
KEJURUTERAAN KIMIA		
77580	AZLAN BIN MOHAMAD	BE HONS (UTM) (CHEMICAL, 2011)
49608	SER CHOON FUI	BE HONS (UPM) (CHEMICAL, 2004)
KEJURUTERAAN MEKANIKAL		
74390	AHMAD FAUZI BIN FUDZIN	BE HONS (UTM) (MECHANICAL, 1992)
23111	HAZLIN BIN HARUN	BE HONS (UiTM) (MECHANICAL, 2006)
49621	LEONG YEW HON	ME (NOTTINGHAM) (MECHANICAL, 2009)
49296	SUPPAH RAO A/L RAMANAIDU	BE HONS (UTM) (MECHANICAL, 2001)
33891	IZMIR ZIKRY BIN IBRAHIM	BE HONS (UiTM) (MECHANICAL, 2005)
39808	MOHAMED RIZAR BIN MOHAMAD	BE HONS (UiTM) (MECHANICAL, 2014)
66094	SEAH BOON HONG	BE HONS (UTAR) (MECHANICAL, 2010)
47638	IRFAN BIN ABD RAHIM	BE HONS (UTHM) (MECHANICAL, 2003) MSc (UPM) (AEROSPACE, 2006)
78878	YAP YOON LOY	ADV. DIP (UTAR) (MECHANICAL, 2004) BE HONS (SHEFFIELD HALLAM) (2004) ME (UPM) (ENVIRONMENTAL, 2010)
41401	ANG HUAT POH	BE HONS (MALAYA) (MECHANICAL, 2012)
50705	MOHAMAD ZAZUAN BIN MOHAMED ZAKARIA	BE HONS (MALAYA) (MECHANICAL, 2010) ME (MALAYA) (MECHANICAL, 2014)
94161	ZUNAIDI BIN IBRAHIM	BE (MIE UNIVERSITY) (MECHANICAL, 1997) ME (MIE UNIVERSITY) (MECHATRONICS, 2003) PhD (MIE UNIVERSITY) (2006)

TEMUDUGA PROFESIONAL

32372	MOHAMAD AZAM B. RAAIS	BE HONS (UITM) (MECHANICAL, 2008)	58074	SYAZLAN BIN MOHD HISYAM	BE HONS (UTHM) (MECHANICAL, 2008)
70638	AIZAT AMZAR BIN SAHAR	BE HONS (UTM) (MECHANICAL-MARINE TECHNOLOGY, 2009)	56539	LIM CHEE HONG	BE HONS (UniMAP) (MECHANICAL, 2009)
26133	GHAZALI BIN SAFIE	BE HONS (UTM) (MECHANICAL, 2006)	49614	CHOA ZHENG GUANG	BE HONS (MONASH) (MECHANICAL, 2008)
66436	WONG CHEE KONG	BE HONS (UNITEN) (MECHANICAL, 2013)	97288	AHMAD SHAH HIZAM BIN MD YASIR	BE HONS (MALAYA) (MANUFACTURING, 2010) ME (UPM) (ENGINEERING MANAGEMENT, 2016)
50690	MOHD HELMI BIN MD IUZZIDDIN	BE HONS (UITM) (MECHANICAL, 2007)	75143	CHAY KWOK GOON	BE HONS (UTAR) (MECHANICAL, 2010)
87620	LOW YAO WEN	BE HONS (NEW SOUTH WALES) (MECHANICAL, 2010)	46792	ARAVINTHAN A/L RAJAANDRA	BE HONS (UMP) (MECHANICAL, 2009)
22981	MOHAMAD NIZAM BIN IBRAHIM	BE HONS (UITM) (MECHANICAL, 2003)	40429	SHAIFUL FADZIL BIN ZAINAL ABIDIN	BE HONS (UTM) (MECHANICAL-AUTOMOTIVE, 2011) ME (UTM) (MECHANICAL, 2017)
22886	CHEONG POH WAH	BE HONS (UPM) (MECHANICAL, 2004)	37523	AHMAD DELI BIN MOHD NOOR	BE HONS (UTeM) (STRUCTURE & MATERIAL, 2009)
43807	ASHLIE BIN ABDUL RAHIM	BE HONS (UTP) (MECHANICAL, 2001)			
51619	MOHD FAIZAL BIN GHAZALI	BE HONS (UTeM) (STRUCTURE & MATERIAL, 2012)			
43105	GHONG WEI LUN	BE HONS (UTAR) (MECHANICAL, 2009)			
96885	SURESHRAJ VASUDEVAN	BSc (WICHITA STATE) (MECHANICAL, 2008)			
49388	MOHD AZWAN BIN BAKAR	BE HONS (UTM) (MECHANICAL, 2008)			

PERMOHONAN BARU/PEMINDAHAN MENJADI AHLI KORPORAT

Nama	Kelayakan
KEJURUTERAAN MEKANIKAL	
ABDAH BIN DERAMAN	BE HONS (UITM) (MECHANICAL, 2003)

CONTINUATION MEMBERSHIP LIST AS OF MARCH JURUTERA ISSUE 2018

PEMINDAHAN KEPADA AHLI SISWAZAH

No. Ahli	Nama	Kelayakan
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KEJURUTERAAN ELEKTRIKAL

85448	IMMAD SHAMS	B.E.HONS.(UNI. OF EAST LONDON)(ELECTRICAL & ELECTRONICS-POWER, 2015) M.E.(UTM) (ELECTRICAL POWER, 2017)
44301	MOHD YUSHAKMAL BIN MOHD YUSOF	B.E.HONS.(UTEM) (ELECTRICAL-INDUSTRIAL POWER, 2011)
49770	MOHD AZUAN BIN BASRI	B.E.HONS.(UTHM) (ELECTRICAL, 2012)

KEJURUTERAAN ELEKTRONIK

55454	NOOR AZIDIN BIN BAKRI	B.E.HONS.(UTHM) (ELECTRONIC, 2016)
66621	SOO HON WING	B.E.HONS.(UNITEN) (ELECTRICAL & ELECTRONICS, 2013)

KEJURUTERAAN KIMIA

73178	NG TECK HUAI	B.E.HONS.(UMP)(CHEMICAL, 2015)
78613	GOO BOON CHIN	B.E.HONS.(UMP)(CHEMICAL, 2016)
78497	LIM LIT WOON	B.E.HONS.(UMP)(CHEMICAL, 2016)
29947	DR LAU LEE CHUNG	B.E.HONS.(USM) (CHEMICAL, 2008) M.SC.(USM)(CHEMICAL, 2010) PHD.(USM)(ADSORPTION, 2016)
35977	NUR NAZLINA BINTI SAIMON	B.E.HONS.(UTM) (CHEMICAL, 2012) M.SC.(UTM)(SAFETY, HEALTH & ENVIRONMENT, 2014)

KEJURUTERAAN MEKANIKAL

32275	IQBAL BIN MOHAMED MUSA	B.E.HONS.(IIUM) (MECHANICAL-AUTOMOTIVE, 2010)
32372	MOHAMAD AZAM BIN RAAIS	B.E.HONS.(UITM) (MECHANICAL, 2008)
32362	LUQMANUL HAKIM BIN HATMIN	B.E.HONS.(UITM) (MECHANICAL, 2012)
50380	HAIDAR IBTISAM BIN AHMAD NIZAR	B.E.HONS.(UITM) (MECHANICAL, 2014)
66014	MUHAMMAD FITRI BIN DAUD	B.E.HONS.(UNISEL) (MECHANICAL, 2016)
71170	MUHAMMAD 'AIZAT BIN PAIMAN	B.E.HONS.(UNITEN) (MECHANICAL, 2017)
72758	HO YEE CHEAN	B.E.HONS.(UNITEN) (MECHANICAL, 2017)
31826	MOHAMAD RUZAINI BIN AHMAD MONTAHA	B.E.HONS.(USM) (MECHANICAL, 2011)
71457	YULIS HAYAT BIN MHD YUSOP	B.E.HONS.(UTM) (MECHANICAL, 2017)

60713	MUHAMMAD HAKIM B. MUHIDDIN	B.E.HONS.(UTP) (MECHANICAL, 2015)
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KEJURUTERAAN MEKATRONIK

54415	CHAN CHANG LUN, JOSEPH	B.E.HONS.(MONASH) (MECHATRONICS, 2013)
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KEJURUTERAAN PEMBUATAN

53891	SEE CHEE HONG	B.E.HONS.(MALAYA)(CAD & MANUFACTURING, 2013)
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PERMOHONAN MENJADI AHLI SISWAZAH

No. Ahli	Nama	Kelayakan
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KEJURUTERAAN AEROANGKASA

95846	SAIDATUL SYIREEN BINTI SHAZRI	B.E.HONS.(IIUM) (AEROSPACE, 2016)
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KEJURUTERAAN AWAM

94355	TAN KOK CHIN	B.E.(UMP)(CIVIL, 2009)
94325	CHIN WEI YANG, BRIAN	B.E.HONS.(CURTIN UNI. OF TECH.)(CIVIL & CONSTRUCTION, 2016)
94686	CHUA ZHENG WEI, KENNETH RUSSELL	B.E.HONS.(CURTIN UNI. OF TECH.)(CIVIL & CONSTRUCTION, 2017)
95911	WONG YU HORNG, TIMOTHY	B.E.HONS.(CURTIN UNI. OF TECH.)(CIVIL & CONSTRUCTION, 2017)
94333	JONG ZEH WEI	B.E.HONS.(CURTIN UNI. OF TECH.)(CIVIL CONSTRUCTION, 2017)
94374	HO ZI HAO	B.E.HONS.(CURTIN UNI. OF TECH.)(CIVIL, 2017)
94660	LAU HUI JIN	B.E.HONS.(CURTIN UNI. OF TECH.)(CIVIL, 2017)
95879	DR. LIM KAH WEE, KELVIN	B.E.HONS.(DEAKIN UNI.)(CIVIL, 2013) PHD.(DEAKIN UNI.)(2016)
95862	ELUMALAI A/L ARRUMUGAM	B.E.HONS.(INTI INT. UNI.) (CIVIL, 2016)
94700	SAKTISH RAMANATHAN	B.E.HONS.(IUKL)(CIVIL, 2014)
94697	DHARSHINI RAMAN	B.E.HONS.(KLIUC)(CIVIL, 2010)
94383	CHIA PEI SHUN	B.E.HONS.(LOUGHBOROUGH UNI.)(CIVIL, 2007) M.SC.(UNI. OF SOUTHAMPTON)(CIVIL, 2013)
94354	KIEW CHON KHEONG	B.E.HONS.(MALAYA)(CIVIL, 2010)
94364	LIAW EI HONG	B.E.HONS.(NUS)(CIVIL, 2012)
94382	HOH SHEN YOONG	B.E.HONS.(OKLAHOMA STATE UNI.)(CIVIL, 2015)
94344	WONG YEE TUNG	B.E.HONS.(SWINBURNE UNI OF TECH.)(CIVIL, 2012)
95812	NG WEI ZHEN, CORNELIUS	B.E.HONS.(SWINBURNE UNI. OF TECH.)(CIVIL, 2014)
95805	WAN FADLI BIN WAN MOHAMAD	B.E.HONS.(UITM)(CIVIL, 2001)
95841	KHAIROL NIZAM BIN WAKIMAN	B.E.HONS.(UITM)(CIVIL, 2004)

95898	DR NURYANTZPURA BINTI MOHAMAD RAIS	B.E.HONS.(UITM)(CIVIL, 2007) M.E.(UPM)(HIGHWAY & TRANSPORTATION, 2010) PHD.(UITM)(TRANSPORT & LOGISTICS, 2016)
95904	MOHD HASNAN BIN SHAMSUDIN	B.E.HONS.(UITM)(CIVIL, 2009)
95878	HAFIZUL HILMI BIN MOHD GHAZALI	B.E.HONS.(UITM)(CIVIL, 2010)
95854	MOHD ARIFF BIN HUSSIN	B.E.HONS.(UITM)(CIVIL, 2010)
95896	MUHAMMAD SHAKIRIN BIN AHMAD SHUHAIMI	B.E.HONS.(UITM)(CIVIL, 2010)
95837	MUHAMMAD SHAIFULL IZWAN BIN AB HAMID	B.E.HONS.(UITM)(CIVIL, 2011)
94315	NURUL HUSNA BINTI ABDUL RAZAK	B.E.HONS.(UITM)(CIVIL, 2011)
95836	FAISAL BIN NOORAZMAN	B.E.HONS.(UITM)(CIVIL, 2011)
95863	WAN MUHAMMAD HAFIZ BIN ZAKARIA	B.E.HONS.(UITM)(CIVIL, 2011) M.SC.(CARDIFF UNI.)(CIVIL, 2017)
94381	MUHAMMAD SAIFI BIN ELIAS	B.E.HONS.(UITM)(CIVIL, 2012)
94695	MOHD KHAIRUL AFZAN BIN MOHD LAZI	B.E.HONS.(UITM)(CIVIL, 2014)
95808	UMI NADRAH BT ABDUL GHANI	B.E.HONS.(UITM)(CIVIL, 2014)
94387	MOHAMAD HAZIM MUSTAFA BIN RAHMAT	B.E.HONS.(UITM)(CIVIL, 2014) M.E.(UKM) (CIVIL, 2015)
94331	MUHAMMAD FAROUZ NIZAM BIN ROSLI	B.E.HONS.(UITM)(CIVIL, 2017)
94668	AHMAD NAFEK BIN AUGUST FOUZY	B.E.HONS.(UKM)(CIVIL & ENVIRONMENTAL, 2016) B.SC.(UNI. OF DUISBURG ESSEN)(STRUCTURAL, 2015)
94337	JURY @ JERRY GUNGAT	B.E.HONS.(UKM)(CIVIL & STRUCTURAL, 1998)
95909	PETROCELLI JOSEPH	B.E.HONS.(UKM)(CIVIL & STRUCTURAL, 1999)
95803	YUSDI BIN KADIR	B.E.HONS.(UKM)(CIVIL & STRUCTURAL, 1999)
94326	MOHD HAWARI BIN ABD. RAHMAN	B.E.HONS.(UKM)(CIVIL & STRUCTURAL, 2010)
94636	SIM SIN YEE	B.E.HONS.(UMP)(CIVIL, 2014)
95912	ABDUL GAFFAR BIN AMARULLAH	B.E.HONS.(UMS)(CIVIL, 2010)
94698	LAU CHONG NGING, DENNIS	B.E.HONS.(UMS)(CIVIL, 2010)
94638	JERALD PHILIP	B.E.HONS.(UMS)(CIVIL, 2013)
94365	MOHD IZWAN @ EBOY BIN JUMAT	B.E.HONS.(UMS)(CIVIL, 2009)

94375	TEH KHEAN SIANG	B.E.HONS.(UNI. OF EAST LONDON)(CIVIL, 2011) M.E.(UTM)(CIVIL-STRUCTURAL, 2015)	94372	MUHAMMAD AFIQ NAQUIDDIN BIN MUHAMAD ZUBIR	B.E.HONS.(UTM)(CIVIL, 2016)	94320	A'IN AMIRAH BINTI KAMARULZAMAN	B.E.HONS.(UITM.) (ELECTRICAL, 2017)
94655	TAN JIA JUN	B.E.HONS.(UNI. OF MANCHESTER)(CIVIL, 2015) M.SC.(UNI. OF BIRMINGHAM) (GEOTECHNICAL, 2016)	94664	NORHASANA BINTI MOKHTAR	B.E.HONS.(UTM)(CIVIL, 2016)	95883	LIM CHAW YIH	B.E.HONS.(UKM) (ELECTRICAL & ELECTRICAL, 2012)
94380	THARMESH SELVARAJOO	B.E.HONS.(UNI. OF PORTMOUTH)(CIVIL, 2014) M.SC.(CARDIFF UNI.) (STRUCTURAL, 2017)	95832	NUR LIYANA BINTI ABDUL AZIZ	B.E.HONS.(UTM)(CIVIL, 2016)	94659	TANG SOOK KWAN	B.E.HONS.(UMS) (ELECTRICAL & ELECTRONICS, 2009)
94688	AG KHAIRUL AKMAL BIN KAMALUDIN	B.E.HONS.(UNI. OF PORTSMOUTH)(CIVIL, 2014) M.SC.(CARDIFF UNI.) (STRUCTURAL, 2016)	94352	THIYAGU A/L MANOGARAN	B.E.HONS.(UTM)(CIVIL, 2016)	95884	AHMAD IZZUDDIN BIN HISHAM	B.E.HONS.(UMS) (ELECTRICAL & ELECTRONICS, 2012)
94652	ZAIT AIVIAN YUE BINTI YACUB	B.E.HONS.(UNIMAS)(CIVIL, 2012)	95893	LEE HAN WAY	B.E.HONS.(UTP)(CIVIL, 2014) M.SC.(UTP)(CIVIL, 2017)	95840	VASANTHASEHNAN RAM A/L RAJARAM	B.E.HONS.(UMS) (ELECTRICAL & ELECTRONICS, 2015)
95861	TAN CHIN CHIU, BENNY	B.E.HONS.(UNIMAS)(CIVIL, 2013)	94318	TIONG KET CHIING, JACKY	B.E.HONS.(UTP)(CIVIL, 2015)	94654	CHEN ZHU SHIN	B.E.HONS.(UMS) (ELECTRICAL & ELECTRONICS, 2016)
94348	JENARTENAN A/L TEGARAJA	B.E.HONS.(UNISEL)(CIVIL, 2010)	95875	FOO WEN LIN	B.E.HONS.(UTP)(CIVIL, 2016)	94661	NUR FADIAH ABDUL MUTALIB	B.E.HONS.(UNI. OF SOUTHAMPTON) (ELECTRICAL, 2004) M.E.(UNITEN)(ELECTRICAL, 2017)
94321	SITI ZULEIKA BINTI ZAMALIK	B.E.HONS.(UNITEN)(CIVIL, 2009)	94651	KEE RI HONG	B.E.HONS.(UTP)(CIVIL, 2016)	94648	MOHD HAFIZ ASNAWI BIN MOHD SUHAIMI	B.E.HONS.(UNIKL) (ELECTRICAL, 2016)
94680	NUR SALEEHAH RAEZA BINTI MOHD NIZAM	B.E.HONS.(UNITEN)(CIVIL, 2012)	95856	NALINII RAVICHANDRAN RICKNESH A/L KISHOR	B.E.HONS.(UTP)(CIVIL, 2016)	94385	MUHAMMAD NUR 'ARIF BIN MANAN	B.E.HONS.(UNIMAP) (ELECTRICAL SYSTEM, 2016)
94345	NURZARWINA BINTI RAMLI	B.E.HONS.(UNITEN)(CIVIL, 2016)	95848	DARRYL IAN J. JOINOL	B.SC.(BOISE STATE UNI.) (CIVIL, 2012)	94349	AHMAD FAIZAL BIN ABD RAHMAN	B.E.HONS.(UNIMAP) (ELECTRICAL SYSTEMS, 2007)
94322	MAGANRAAJ A/L TANASKULI	B.E.HONS.(UNITEN)(CIVIL, 2017)	95792	HAN FATT JUAN	B.SC.(SOUTH DAKOTA STATE)(CIVIL, 1990) M.SC.(SOUTH DAKOTA STATE)(CIVIL, 1992)	94377	NG TONG HENG	B.E.HONS.(UNITEN) (ELECTRICAL & ELECTRONICS, 2008)
94640	CHEN MEI SHAN	B.E.HONS.(UPM)(CIVIL, 2012)	95831	CHUAH KAI JIAN	B.SC.(UNI OF ALBERTA) (CIVIL, 2017)	95869	LIM YEW XING	B.E.HONS.(UNITEN) (ELECTRICAL & ELECTRONICS, 2013)
95864	LOW PHAK SHENG	B.E.HONS.(UPM)(CIVIL, 2015)	94235	IR. SAZALI BIN MOHAMAD SHARIFF	B.SC.(UNI. OF HARTFORD) (CIVIL, 1989)	94358	REETHA SHAMINI A/P PACHYMUTHU	B.E.HONS.(UNITEN) (ELECTRICAL & ELECTRONICS, 2013) M.E.(UTM)(ELECTRICAL POWER, 2016)
95795	MOHAMAD ZUL HELMIE BIN ZAABA	B.E.HONS.(UPNM)(CIVIL, 2015)	94677	CHONG KEAN CHEW	B.SC.(UTAH STATE UNI.) (CIVIL, 1997)	94336	LIM AUN SIONG	B.E.HONS.(UNITEN) (ELECTRICAL ELECTRONICS, 2001) MBA.(MMU)(2010)
95794	MOHD FAIZ BIN MD ZIN	B.E.HONS.(UPNM)(CIVIL, 2015)	95797	YEAP MING SOO	M.E.HONS.(UNI. OF BATH) (CIVIL, 2016)	94679	MOHD FAIZAL BIN ISMAIL	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2009)
95796	MUHAMAD SAFUAN BIN IBRAHIM	B.E.HONS.(UPNM)(CIVIL, 2015)	94703	CHAM TZE YING, SELWYN	M.E.HONS.(UNI. OF BRISTOL) (CIVIL, 2016)	95850	MUHAMMAD EZIRI SAIRI BIN MOHD RAZALI	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2012)
94312	ALIF BIN ABD HAMID	B.E.HONS.(UPNM)(CIVIL, 2016)	94689	LOK MING SHANN	M.E.HONS.(UNI. OF NOTTINGHAM)(CIVIL, 2011)	94642	DASARATA BALAKRISHNAN	B.E.HONS.(UNITEN) (ELECTRICAL POWER, 2013)
94647	DR AFIZAH BINTI AYOB	B.E.HONS.(USM)(CIVIL, 1999) M.SC.(USM)(CIVIL, 2006) PHD.(USM)(ENVIRONMENTAL TECHNOLOGY, 2013)	95813	LEE ZHEN NING	M.E.HONS.(UNI. OF NOTTINGHAM)(CIVIL, 2015)	95845	NOOR HAFIZ ZAIDI BIN HALIM	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC, 2015)
94643	MUHAMAD FARID BIN MOHD NORDIN	B.E.HONS.(USM)(CIVIL, 2014)	95798	LEE CHUN KEAT	M.E.HONS.(UNI. OF NOTTINGHAM)(CIVIL, 2017)	94350	ABDULLAH BIN HARMAN SHAH RANIRI	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC-POWER, 2016)
95899	ABANG ABDUL QAYYUM BIN ABANG YUSOP	B.E.HONS.(USM)(CIVIL, 2016)	95804	WONG WAI KAE, ADRIAN	M.E.HONS.(UNI. OF NOTTINGHAM)(CIVIL, 2017)	94667	IDD MUBARAK BIN ZAMRI	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC-POWER, 2016)
95859	LIM SHIANG JIE	B.E.HONS.(UTAR)(CIVIL, 2011)	KEJURUTERAAN BIODINAMIKA			94342	MOHAMAD AMIRUL SHAFIQ BIN SABTU	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC-POWER, 2016)
94682	CHANG TUEN HUI	B.E.HONS.(UTAR)(CIVIL, 2013)	94371	LUQMANHAKIM BIN MOHD FO'AD	B.E.HONS.(IUM) (BIOCHEMICAL-BIOTECHNOLOGY, 2015)	94314	MUHAMAD MUSTAQIM BIN SAUPI	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC-POWER, 2016)
94351	NOR HALIF BIN NOR ZAMAN	B.E.HONS.(UTHM)(CIVIL, 2012)	KEJURUTERAAN ELEKTRIKAL			94368	MUHAMMAD AIDHIL BIN SAMSUDIN	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC-POWER, 2016)
94681	MUHAMMAD ZAIDI BIN ALLIAS	B.E.HONS.(UTHM)(CIVIL, 2013)	95793	WONG PARK CHUNG	B.E.(UNI. OF TASMANIA) (ELECTRICAL POWER, 2011)	94669	MUHAMMAD DANIAL BIN NAJIB	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC-POWER, 2016)
94356	LINGESWARRAN NUMBIKANNU	B.E.HONS.(UTHM)(CIVIL, 2016)	94346	MUHD FUAD SYAHMI BIN JAMALUDIN	B.E.(UNSW)(ELECTRICAL, 2013)	94313	MUHAMMAD FIRDAUS BIN YAHAYA	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC-POWER, 2016)
94671	MUHAMMAD NUR HADI BIN MOHTAR	B.E.HONS.(UTHM)(CIVIL, 2016)	95882	THIEN JUIN YII	B.E.HONS.(CURTIN UNI. OF TECH.)(ELECTRICAL POWER, 2012)	94670	MUHAMMAD HAFIZ BIN MOHD YUSOFF	B.E.HONS.(UPNM) (ELECTRICAL & ELECTRONIC-POWER, 2016)
95902	MOHD NUR ASMAWISHAM BIN ALEL	B.E.HONS.(UTM)(CIVIL, 1999) M.E.(UTM)(STRUCTURE, 2003)	94334	WONG SHY CHIEN	B.E.HONS.(MALAYA) (ELECTRICAL, 2016)	95809	MOHAMAD ALI BIN ABU BAKAR	B.E.HONS.(UTEM) (ELECTRICAL-INDUSTRIAL POWER, 2009)
94675	LIM KEAN HONG	B.E.HONS.(UTM)(CIVIL, 2000)	95907	SHAHRIK IDZWAN BIN ZAINUDIN	B.E.HONS.(MMU) (ELECTRICAL, 2006)	95903	YAP CHEW MAY, CINDY	B.E.HONS.(UTHM) (ELECTRICAL, 2008)
95849	ABD LATIF BIN MD ZAIN	B.E.HONS.(UTM)(CIVIL, 2001)	94366	DR. TAN KHENG SUAN, FREDDY	B.E.HONS.(MMU) (ELECTRICAL, 2010) PHD.(MALAYA)(ENGINEERING, 2015)			
94330	FRASSER ANAK GEORGE MICHAEL	B.E.HONS.(UTM)(CIVIL, 2005)	94649	NADARAJAN SUBRAMANIAM	B.E.HONS.(TAYLOR'S UNI.)(ELECTRICAL & ELECTRONIC, 2013)			
94386	DR SITI NORAFIDA BINTI JUSOH	B.E.HONS.(UTM)(CIVIL, 2006) PHD.(UTM)(CIVIL, 2017)	94369	SAJEESH NAIR A/L MADHAVAN	B.E.HONS.(UCSI) (ELECTRICAL & ELECTRONIC, 2013)			
95872	MOHD HASLIMI BIN RAMLI @ MOHD RAMLI	B.E.HONS.(UTM)(CIVIL, 2007)	94339	AHMAD SAIFUL IZZA BIN HASHIM	B.E.HONS.(UITM) (ELECTRICAL, 2006)			
94311	MOHD FAKRI BIN MUDA	B.E.HONS.(UTM)(CIVIL, 2009)	94672	NAZLAN AZIZI BIN ABD AZIZ	B.E.HONS.(UITM) (ELECTRICAL, 2009)			
95913	GOH JING LIN	B.E.HONS.(UTM)(CIVIL, 2011)	94367	AHMAD USSHAMMA BIN AMERUDIN	B.E.HONS.(UITM) (ELECTRICAL, 2012)			
95908	ZAIRUL RIZA BIN ABDUL MANAN	B.E.HONS.(UTM)(CIVIL, 2011)	94699	MOHD SAIFUL HAFIZI BIN ZAKARIA	B.E.HONS.(UITM) (ELECTRICAL, 2013)			
95801	ZETTY SHAZLIN BINTI MOHAMED	B.E.HONS.(UTM)(CIVIL, 2011)	94650	LUGMAN BIN PIRMANANG	B.E.HONS.(UITM) (ELECTRICAL, 2016)			
94360	LAU JIE MIN	B.E.HONS.(UTM)(CIVIL, 2014)						
94363	KALAIHELWAN A/L SUBRAMANIAM	B.E.HONS.(UTM)(CIVIL, 2016)						

94705	MUHAMAD IRWAN BIN CHE ROHIM	B.E.HONS.(UTHM) (ELECTRICAL, 2010)	95852	DR AZMAN BIN AHMAD	B.E.HONS.(UTM) (ELECTRICAL-ELECTRONICS, 2002)	94635	MUHAMMAD ALIF SOPHIAN BIN MOHD ASRI	B.E.HONS.(THE UNI OF NEBRASKA-LINCOLN) (MECHANICAL, 2013)
95816	NIK HASANUL ANWAR BIN GHANI	B.E.HONS.(UTHM) (ELECTRICAL, 2010)	94388	AZIZUL BIN KEPLI	B.E.HONS.(UTM) (ELECTRICAL-MECHATRONIC, 2007)	95818	PERABU A/L MOORTY	B.E.HONS.(UMP) (MECHANICAL, 2013)
94645	MOHD RAIS SAIFUDDIN BIN OTHMAN	B.E.HONS.(UTHM) (ELECTRICAL, 2013)	95873	UMI KALSOM BINTI MOHAMAD YUSOF	B.E.HONS.(UTM) (ELECTRICAL-MEDICAL ELECTRONICS, 2012)	95802	HENG CHI CHIEN	B.E.HONS.(UMS) (MECHANICAL, 2016)
95876	STEINOLD PAULI	B.E.HONS.(UTHM) (ELECTRICAL-TELECOMMUNICATION, 2007)	94341	CHONG HOR KONG	M.E.HONS.(UNI. OF NOTTINGHAM)(ELECTRONIC & COMPUTER, 2017)	94329	KUEH CHUN KIAT	B.E.HONS.(UNI. OF PORTMOUTH)(MECHANICAL & MANUFACTURING, 2002)
94384	NORHAILIZA BINTI AMIR HAMZAH	B.E.HONS.(UTM) (ELECTRICAL, 2005)	95910	DR CHAN YI JING	B.E.HONS.(MALAYA) (CHEMICAL, 2007)	94653	KHAIRUL 'AQIL BIN KHAIRULNISAN	B.E.HONS.(UNI. OF TECHNOLOGY SYDNEY) (MECHANICAL, 2017)
95834	MUNA NAZURAH BINTI MOHTAR	B.E.HONS.(UTM) (ELECTRICAL, 2015)	94310	TING YI QI, JASON	B.E.HONS.(MALAYA) (CHEMICAL, 2016)	95814	AHMAD FATHIAKHIR BIN MOHAMAD	B.E.HONS.(UNI. OF WOLLONGONG) (MECHANICAL, 2014)
94693	MOHAMMAD SYAMIM BIN MOHAMMAD BASRI	B.E.HONS.(UTM) (ELECTRICAL, 2016)	94319	YONG KUN GUAN	B.E.HONS.(MALAYA) (CHEMICAL, 2016)	94656	MUHAMMAD LUQMAN HAKIM BIN MOHAMAD	B.E.HONS.(UNIKL) (MECHANICAL, 2016)
94347	MUHAMMAD ASYRAF BIN AIZUDDIN	B.E.HONS.(UTM) (ELECTRICAL, 2016)	94353	LEONG YIP CHENG, JANET	B.E.HONS.(MONASH) (CHEMICAL, 2013)	94690	LEE YEW YU, JACKIE	B.E.HONS.(UNIMAP) (MECHANICAL, 2015)
95851	SOM SAK A/L EH FORM	B.E.HONS.(UTM) (ELECTRICAL-INSTRUMENTATION & CONTROL, 2007)	95891	FAIZAL FARIS BIN MOHAMAD SHAFFIE	B.E.HONS.(UITM)(CHEMICAL & PROCESS, 2014)	94389	DR MOHD NASRULL BIN ABDOL RAHMAN	B.E.HONS.(UNISEL) (MECHANICAL, 2007)
95870	MOHAMAD ASYRAF BIN SAMSUDIN	B.SC.(IOWA STATE UNI. OF SCIENCE & TECH.) (ELECTRICAL, 2016)	95844	ARINA BINTI SAUKI	B.E.HONS.(UITM) (CHEMICAL, 2008)	94694	YAP WAI KEAT	B.E.HONS.(UNITEN) (MECHANICAL, 2006)
95858	ASYRAFUDDIN BIN ABD WAHAB	M.E.HONS.(CARDIFF UNI.)(ELECTRICAL & ELECTRONICS, 2017)	95810	AZRI BIN MARMOH	B.E.HONS.(UMP)(CHEMICAL, 2013)	95867	NG XU LI	B.E.HONS.(UNITEN) (MECHANICAL, 2007)
KEJURUTERAAN ELEKTRONIK			KEJURUTERAAN KIMIA					
95791	NAZUHA BINTI FADZAL	B.E.HONS.(UITM) (ELECTRICAL, 2006)	94673	ANAS AMIRUL HAKIM BIN JAMAL NASIR	B.E.HONS.(UNI. OF AUCKLAND)(CHEMICAL & MATERIALS, 2014)	94307	ABU DHAHIR BIN SAIFUDDIN	B.E.HONS.(UNITEN) (MECHANICAL, 2010)
95819	NUR DALILA BINTI KHIRUL ASHAR	B.E.HONS.(UITM) (ELECTRICAL, 2010)	94665	YEOH WEI MING	B.E.HONS.(USM)(CHEMICAL, 2008)	94309	WAN MOHD FIRDAUS BIN MOHD RAUS	B.E.HONS.(UNITEN) (MECHANICAL, 2011)
94696	LOKE WING RICK	B.E.HONS.(UNI OF HERTFORDSHIRE) (ELECTRICAL & ELECTRONIC, 2000)	95895	DR ONG YIT THAI	B.E.HONS.(USM) (CHEMICAL, 2008)	95906	MOHAMED ABDUL BARI BIN BAHARUDDIN	B.E.HONS.(UNITEN) (MECHANICAL, 2012)
94637	NORAHMARISRAJ BINTI AHMAD	B.E.HONS.(UNIMAP) (BIOMEDICAL ELECTRONIC, 2013)	95889	NGU WANG KEAT	B.E.HONS.(UTAR)(CHEMICAL, 2014)	95881	ABDULLAH BIN AZMI	B.E.HONS.(UNITEN) (MECHANICAL, 2013)
94316	LEE JUN YI	B.E.HONS.(UNIMAP) (ELECTRONIC, 2016)	95897	MUHAMED AMIN BIN MOKHTAR	B.E.HONS.(UTM)(CHEMICAL, 2015)	94674	PHANG ZHENG JIE	B.E.HONS.(UNITEN) (MECHANICAL, 2013)
94390	VINMALAAR A/P KUNAISEKARAN	B.E.HONS.(UNITEN) (ELECTRICAL & ELECTRONICS, 2013)	94704	RINGO LIM	B.E.HONS.(UTM)(CHEMICAL-GAS, 2001)	95839	REVEATHARAN THIAGARAJAN	B.E.HONS.(UNITEN) (MECHANICAL, 2013)
95901	DUALI MUNSIN	B.E.HONS.(USM) (ELECTRICAL & ELECTRONIC, 1997)	KEJURUTERAAN MEKANIKAL			94324	CHUAH WUI CUAN	B.E.HONS.(UNITEN) (MECHANICAL, 2015)
94359	MOHAMAD SOFIAN BIN ABU TALIP	B.E.HONS.(USM) (ELECTRONIC, 2005)	94684	WONG TIONG SING	B.E.(MONASH UNI.) (MECHANICAL & COMPUTING, 1994)	94666	POON TUCK SENG	B.E.HONS.(UNITEN) (MECHANICAL, 2015)
95853	NUR DARINA BINTI AHMAD	B.E.HONS.(UTHM) (ELECTRICAL, 2009)	95892	DR. MUHAMMAD NUR FARHAN BIN SANIMAN	B.E.(NAGAOKA UNI. OF TECH.)(MECHANICAL, 2011)	95843	GANES A/L TAREMELINGGAM	B.E.HONS.(UNITEN) (MECHANICAL, 2016)
94357	AZWATI BINTI AZMIN	B.E.HONS.(UTHM) (ELECTRICAL, 2010)	94378	MOHD RIDZUAN BIN SUID	M.E.(NAGAOKA UNI. OF TECH.)(MECHANICAL, 2013)	94676	MUHAMAD NADZMY HAKKIM BIN HELMY FARED	B.E.HONS.(UNITEN) (MECHANICAL, 2016)
94335	DR RADHA SWATHE PRIYA A/P MALON MARUGAN	B.E.HONS.(UTM) (BIO-MEDICAL, 2011)	95857	ALI AZEEZAN BIN MOHAMAD ZON	B.E.(NAGAOKA UNI. OF TECH.)(MECHANICAL, 2012)	94376	MUHAMMAD HAKIM BIN SAMSUL BAHRI	B.E.HONS.(UNITEN) (MECHANICAL, 2016)
94702	AINI HAFIZAH BINTI MOHD SAOD	B.E.HONS.(UTM) (COMPUTER, 2008)	95838	POH WYE KIM, RAYMOND	B.E.(THE UNI. OF ADELAIDE) (MECHANICAL, 2005)	95880	ERDY HERWAN BIN RAHMAT	B.E.HONS.(UPM) (MECHANICAL, 2009)
95865	MOHD SHAZALI BIN RAMLI	B.E.HONS.(UTM)(COMPUTER, 2009)	94332	KU MOHD FAIZ BIN KU AHMAD	B.E.HONS.(IUM) (MECHANICAL-AUTOMOTIVE, 2014)	94361	KOO WEE TAK	B.E.HONS.(UPM) (MECHANICAL, 2009)
94306	NYDIA NATHASHA BINTI ABD RAZAK	B.E.HONS.(UTM) (ELECTRICAL- ELECTRONIC, 2008)	94378	MOHD RIDZUAN BIN SUID	B.E.HONS.(MALAYA) (MECHANICAL, 2010)	94323	KHOR LING SI	B.E.HONS.(UPM) (MECHANICAL, 2012)
95815	NURUL ASHIKIN BINTI ABDUL KADIR	B.E.HONS.(UTM) (ELECTRICAL-BIOMEDICAL ELECTRONIC, 2009)	95835	AHMAD AZRIN BIN NORDIN	B.E.HONS.(MALAYA) (MECHANICAL, 2016)	94338	HASANAT JAMIL-UL HAQUE	B.E.HONS.(UPM) (MECHANICAL, 2017)
94641	ARAVIN NANDHA A/L BASKARAN	B.E.HONS.(UTM) (ELECTRICAL-ELECTRONIC, 2008)	94379	VINOTH THEVAN JANAVELOO	B.E.HONS.(MMU) (MECHANICAL, 2011)	94691	MOHD FAZEEL HELMY BIN MOHD SAUPI	B.E.HONS.(UPNM) (MECHANICAL, 2016)
			95799	TAN JIAN WEI, NICHOLAS	B.E.HONS.(NILAI UNI.) (MECHANICAL, 2016)	94662	AZNIFA MAHYAM BINTI ZAHARUDIN	B.E.HONS.(USM) (MECHANICAL, 2000)
			95800	TEOH WEI ZHI	B.E.HONS.(RMIT) (MECHANICAL, 2017)	94692	MAZRAN BIN AHMAD	B.E.HONS.(USM) (MECHANICAL, 2004)
			95806	FOONG WEI KHIONG, EMMANUEL	B.E.HONS.(SWINBURNE UNI. OF TECH.)(MECHANICAL, 2017)	95833	CHAN CHEN MING	B.E.HONS.(UTAR) (MECHANICAL, 2010)
						94644	MUHAMMAD IZAR BIN MD. NOR	B.E.HONS.(UTEM) (MECHANICAL-AUTOMOTIVE, 2007)
						94370	WAN SYADIQ BIN WAN BADIO ZAMAN	B.E.HONS.(UTEM) (MECHANICAL-DESIGN & INNOVATION, 2007)
						94683	MOHD FAUZY BIN KHAMIS	B.E.HONS.(UTEM) (MECHANICAL-DESIGN & INNOVATION, 2010)
						95847	MUHAMMAD FITRI BIN ABD LATIP	B.E.HONS.(UTEM) (MECHANICAL-THERMAL FLUIDS, 2016)

94657	AZMI BIN MOHAMED	B.E.HONS.(UTHM)(MECHANICAL, 2007))
95874	ALI IMRAN MUHAMMAD IZAM	B.E.HONS.(UTHM)(MECHANICAL, 2010)
94343	FAEZZAN BIN MADLI	B.E.HONS.(UTHM)(MECHANICAL, 2012)
95900	MUHAMMAD TARIQ ZIAD BIN TARMIZI	B.E.HONS.(UTHM)(MECHANICAL, 2014)
94373	ISQANDAR ZULKARNAIN BIN ABU BAKAR	B.E.HONS.(UTHM)(MECHANICAL, 2015)
94658	MOHAMAD IDZHAR BIN ANUAR	B.E.HONS.(UTHM)(MECHANICAL, 2015)
94308	MOHD. IZZINUDDIN BIN MOHD ZAINI	B.E.HONS.(UTHM)(MECHANICAL, 2015)
95866	AMIR SHAFIQ BIN ADHAM	B.E.HONS.(UTM)(MECHANICAL, 2013)
95885	KHALIZAN BIN MOHAMAD	B.E.HONS.(UTM)(MECHANICAL, 2014)
95860	MUHAMMAD FUAD BIN SHAFIE	B.E.HONS.(UTM)(MECHANICAL, 2014)
94685	SALAM BIN TAAZIM	B.E.HONS.(UTM)(MECHANICAL, 2017)
94317	MOHD NOR HAKIM BIN HASSAN	B.E.HONS.(UTM)(MECHANICAL-INDUSTRIAL, 2006)
94362	SYAHRUL ANUAR BIN ABD WAHAB	B.E.HONS.(UTM)(MECHANICAL-MANUFACTURING, 1998)
95817	MOHD FAHMI BIN JAILANI	B.E.HONS.(UTM)(MECHANICAL-MANUFACTURING, 2008)
94706	MUHD MAHZUZ 'AFIF BIN MAHAYUDDIN	B.E.HONS.(UTM)(MECHANICAL-MANUFACTURING, 2010)
95868	AZREEL ZAIREE BIN OMAR	B.E.HONS.(UTP)(MECHANICAL, 2012)
94687	PRASANTH RAJ BASKARAN	B.E.HONS.(UTP)(MECHANICAL, 2016)
94327	ZULKIFLEE BIN HUSSAIN	B.SC.(HANYANG UNI.)(MECHANICAL, 2009)
95811	MUAZ BIN MAZLAN	B.SC.(SUNGKYUNKWAN UNI.)(MECHANICAL, 2012)
95807	TEH BOON TZUAN, JOSHUA	M.E.HONS.(TEESSIDE UNI.)(MECHANICAL, 2015)
94639	LAW CHUN SIAN	M.E.HONS.(UCL)(MECHANICAL, 2015)
94678	MOHD SYAHMI BIN YACOB	M.E.HONS.(UNI. OF SHEFFIELD)(MECHANICAL, 2014)
95894	MUHAMMAD DANIAL BIN HASSAN	M.E.HONS.(UNI. OF SOUTHAMPTON)(MECHANICAL, 2016)

KEJURUTERAAN MEKATRONIK

95887	LIM MIN HONG	B.E.HONS.(APU)(MECHATRONICS, 2015)
94328	DR NG JIUNN YEA	B.E.HONS.(MONASH)(MECHATRONICS, 2009) PHD.(MONASH)(2016)
95842	MUHAMMAD MUAZ BIN ABDUL MALEK	B.E.HONS.(UNISEL)(MECHATRONICS, 2012)
95877	MOHANAD MOHIELDIN SALIH ALI	B.E.HONS.(UNISEL)(MECHATRONICS, 2013)
94646	MOHD AZIZI BIN MAT SAH	B.E.HONS.(USM)(MECHATRONICS, 2007)
94663	DINESH A/L S S MAHKEYDRAN	M.E.HONS.(UNI. OF NOTTINGHAM)(MECHATRONICS, 2016)

KEJURUTERAAN MIKROELEKTRONIK

95871	HAIRIL AZEEM BIN AZMY	B.E.HONS.(UNIMAP)(MICROELECTRONIC, 2008)
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KEJURUTERAAN PEMBUATAN

94701	AHMAD FUAD AB GHANI	B.E.HONS.(UNI. OF SHEFFIELD)(MECHANICAL, 2004) M.SC.(UNI. OF MANCHESTER)(MAINTENANCE ENGINEERING & ASSET MANAGEMENT, 2007)
95886	MUHAMMAD ZAKI BIN ROSLI	B.E.HONS.(UNIMAP)(MANUFACTURING, 2013)

KEJURUTERAAN PROSES & MAKANAN

94340	NUR ASILAH BINTI NASIRUDDIN	B.E.HONS.(UPM)(FOOD & PROCESS, 2016)
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KEJURUTERAAN TELEKOMUNIKASI

95905	NORAZLIZAH MOHD ZAM @ MD LAZAM	B.E.HONS.(MALAYA)(TELECOMMUNICATION, 2006)
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PERMOHONAN MENJADI AHLI 'INCORPORATED'

No. Ahli	Nama	Kelayakan
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KEJURUTERAAN AWAM

95821	SIEW KAM LEONG	B.SC.(FENG CHIA UNI.)(CIVIL, 1987)
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KEJURUTERAAN ELEKTRIKAL

94634	LEE YENG YANG	B.E.HONS.(UNI. OF BRADFORD)(ELECTRICAL & ELECTRONIC, 2015)
94393	DHANUREESAN KHRISNAN	B.E.HONS.(UNI. OF EAST LONDON)(ELECTRICAL & ELECTRONIC-POWER, 2009)
94394	KUHAN A/L GANESWARAN	B.E.HONS.(UNI. OF NOTTINGHAM)(ELECTRICAL & ELECTRONICS, 2009)

KEJURUTERAAN ELEKTRONIK

95820	LEE CHIING LIANG	B.E.HONS.(SHEFFIELD HALLAM UNIVERSITY)(ELECTRONIC SYSTEMS, 2002)
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KEJURUTERAAN KIMIA

94633	DR IRVAN BIN DAHLAN MANSYOER	B.E.(UNIVERSITAS SYIAH KUALA)(CHEMICAL, 1999) M.SC.(USM)(CHEMICAL, 2005) PHD.(USM)(CHEMICAL, 2009)
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PERMOHONAN MENJADI AHLI 'ASSOCIATE'

No. Ahli	Nama	Kelayakan
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KEJURUTERAAN ELEKTRIKAL

95822	GANESH PRASAD A/L WASU	DIPLO.(WIT)(ELECTRICAL/ELECTRONIC, 1995)
94391	MOHD IDHAM BIN RASHID	DIPLO.(UTM)(ELECTRICAL POWER, 2016)

KEJURUTERAAN MEKANIKAL

94392	RAMESH A/L ARUMUGAM	DIPLO.(FIT)(MECHANICAL, 1997)
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5	12327	AZMAN BIN TALIB
6	17568	CHAI SHOON LEONG
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12	02828	CHOO KOK BENG
13	01583	CHOO SENG KIT
14	11719	DONALD MACPHAIL MCLEOD
15	95901	DUALI MUNSIN
16	37254	FARIDAH BINTI RAKIDIN
17	06869	GAN WEE PENG
18	08091	HA TING LIONG
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20	12467	HAFIDZ BIN HASHIM
21	22187	HARDEEP SINGH CHAHIL
22	16994	HASNI BIN HASSAN
23	05127	HEE CHOI
24	04871	HEW WAI THO
25	06689	HONG YIH LIN, LAWRENCE
26	09391	ISMAIL BIN ABDUL RAHMAN
27	16514	JAILANI BIN SALIHON
28	13113	JAMAL BIN ABDUL GHANI
29	20249	KHAIRUL ANWAR BIN HAJI HUSIN
30	14183	LAM HUNG MAN
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35	03651	LIM KEE SIN
36	10675	LIM THUAN SWEE
37	21702	LING CHAI HUI, ANTHONY
38	06440	LINGANATHAN S/O V THILLAINATHAN
39	01994	LOH ENG WAH
40	29020	LOW KIAN YUNG
41	43931	LUQMAAN BIN AHMAD ZAIDI
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48	19730	MOHD REHAT BIN AHMAD @ SALIMAN
49	12809	MOHD SABRI BIN ABDULLAH
50	25559	MOHD. HARDY BIN LAIDIN @ SAIDIN
51	18015	MOHD. TAJUDIN BIN REJAB

52	20117	MOHD. YUSOF BIN AHMAD
53	86618	MONITHA A/P ANTHONISAMY
54	33771	MUHAMMAD AZMIR BIN ABDUL MUTALIB
55	05387	MUHAMMAD RAZIF BIN HAJI IBRAHIM
56	21575	NGIM CHIN KIM
57	03580	NIK MOHD PENA BIN NIK MUSTAPHA
58	05033	NOR HASSAN BIN ISMAIL
59	71674	NORIAH BINTI YUSOFF
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64	94704	RINGO LIM
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68	14955	TENGGU HAZIAN BIN TENGGU AB. HAMID
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70	14417	TU CHUAN FUK
71	07256	UTAP SEBAU

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74	09542	WONG NENG KWONG, PETER
75	17560	WONG SU KEN
76	06389	WONG TEN AN
77	19275	YAH KEM CHUI
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79	21275	YONG KOK HOONG
80	49313	YUZRIAN EFREN YUNUS
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Title: Talk on “Digital Tools for Project Managers: Prospects and Challenges”

19 May 2018

Organised by: Urban Engineering Development Special Interest Group

Time : 9.00 a.m. - 11.00 a.m.

CPD/PDP : 2

Title: Talk on Brownfield Series 4

26 May 2018

Organised by: Project Management Technical Division

Time : 9.00 a.m. - 11.00 a.m.

CPD/PDP : Applying

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Plato DesFire Reader



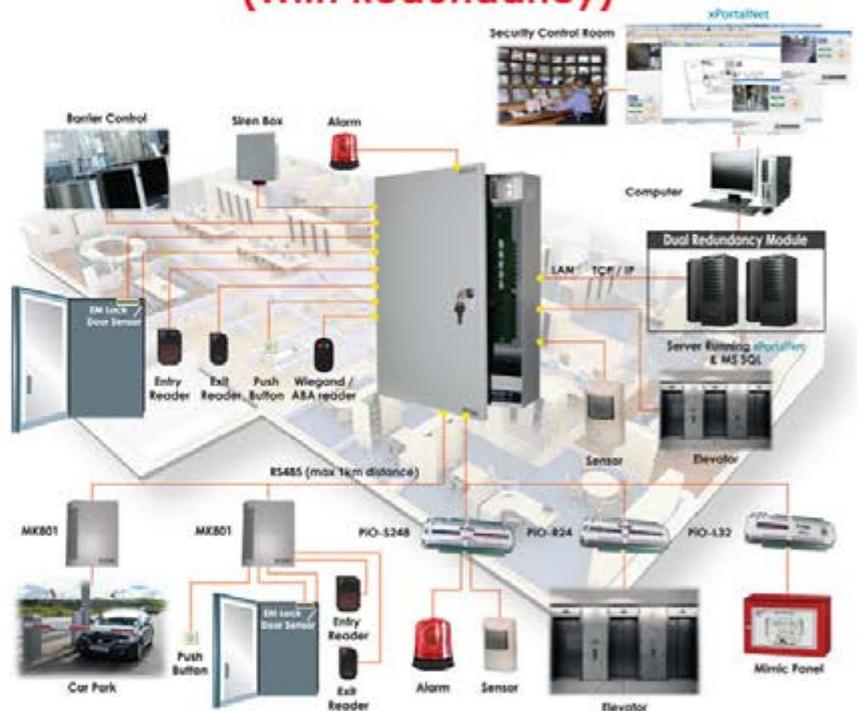
- ▶ 64 Bit Programmable Card ID
- ▶ Encrypted with 3DES
- ▶ Card ID Not by Serial Number

P1000i PoE Controller



- ▶ PoE with Battery Charger
- ▶ AES128 Encrypted IP
- ▶ Support 1 Door/2 Readers

Integrated Security System (With Redundancy)



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