VOL. 2014 NO. 8

AUGUST 2014

JURUTERA

THE MONTHLY BULLETIN OF THE INSTITUTION OF ENGINEERS, MALAYSIA

KDN PP 1050/12/2012 (030192)

ISSN 0126-9909

Environmental Engineering

JURUTERA

Number 8, August 2014 IEM Registered on 1 May 1959

YANG DIPERTUA / PRESIDENT
Y.Bhg. Dato' Ir. Lim Chow Hock

TIMBALAN YANG DIPERTUA / DEPUTY PRESIDENT
Ir. Tan Yean Chin

NAIB YANG DIPERTUA / VICE PRESIDENTS
Ir. P.E. Chong, Ir. Prof. Dr Wan Mahmood bin Wan Ab. Majid, Ir. Prof. Dr Lee Teang Shui, Ir. David Lai Kong Phooi, Y.Bhg. Dato Ir. Dr Andy Seo Kian Haw, Ir. Lee Weng Onn, Ir. Gopal Narian Kutty

SETIAUSAHA KEHORMAT / HONORARY SECRETARY
Ir. Gunasagaran a/l Kristnan

BENDAHARI KEHORMAT / HONORARY TREASURER
Ir. Prof. Dr Jeffrey Chiang Choong Luin

BEKAS YANG DIPERTUA TERAKHIR / IMMEDIATE PAST PRESIDENT
Ir. Choo Kok Beng

BEKAS YANG DIPERTUA / PAST PRESIDENTS
Y.Bhg. Dato' Ir. Pang Leong Hoon, Y.Bhg. Academician Dato' Ir. (Dr) Hj. Ahmad Zaidee bin Laidin, Y.Bhg. Dato' Ir. Dr Gue See Sew, Y.Bhg. Datuk Ir. Prof. Dr Ow Chee Sheng, Y.Bhg. Academician Dato' Ir. Prof. Dr Chuah Hean Teik

WAKIL AWAM / CIVIL REPRESENTATIVE
Ir. Prof. Dr Mohd. Zamin bin Jumaat

WAKIL MEKANIKAL / MECHANICAL REPRESENTATIVE
Ir. Dr Kannan M. Munisamy

WAKIL ELEKTRIK / ELECTRICAL REPRESENTATIVE
Ir. Ali Askar bin Sher Mohamad

WAKIL STRUKTUR / STRUCTURAL REPRESENTATIVE
Ir. Hooi Wing Chuen

WAKIL KIMIA / CHEMICAL REPRESENTATIVE
Ir. Prof. Dr Abdul Aziz bin Abdul Raman

WAKIL LAIN-LAIN DISPLIN / REPRESENTATIVE TO OTHER DISCIPLINES
Ir. S. Kumar a/l Subramaniam

WAKIL MULTIMEDIA / MULTIMEDIA REPRESENTATIVE
Engr. Abdul Fattah bin Mohd. Yatim, M.I.E.M.

AHLI MAJLIS / COUNCIL MEMBERS
Ir. Lee Boon Chong, Ir. Tu Yong Eng, Ir. Lai Sze Ching, Ir. Yap Soon Hoe, Ir. Li Thang Fai, Ir. Juares Rizal bin Abd. Hamid, Ir. Norazman bin Mohamad Nor, Ir. Ellias bin Saidin, Ir. Assoc. Prof. Dr Jimmy Mok Vee Hoong, Ir. Dr Tan Chee Fai, Ir. Kok Hee Poh, Ir. Tiong Ngo Pu, Ir. Yau Chau Fong, Ir. Teh Piaw Ngi, Ir. Assoc. Prof. Ahmad Kamil bin Arshad, Ir. Kim Kek Seong, Ir. Chong Chin Meow, Ir. Chin Kuan Hwa, Ir. Assoc. Prof. Dr Vigna Kumaran Ramachandaramurthy, Ir. Lee Cheng Pay, Ir. Ong Ching Loon, Ir. Gary Lim Eng Hwa, Y.Bhg. Dato' Ir. Noor Azmi bin Jaafar, Ir. Aminuddin bin Mohd. Baki, Ir. Mohd. Radzi bin Salleh, Ir. Ong Sang Woh

PENGERUSI CAWANGAN / BRANCH CHAIRMAN
1. Pulau Pinang: Ir. Paul Phor Chi Wei
2. Selatan: Ir. Assoc. Prof. Hayati binti Abdullah
3. Perak: Ir. Dr Perumal Nallagownden
4. Kedah-Perlis: Ir. Chua Teik Seng
5. Negeri Sembilan: Ir. Shahrin Amri bin Jahari
6. Kelantan: Ir. Hj. Syed Abdul Rahman bin Syed Abdullah
7. Terengganu: Ir. Hj. Abdullah Zawawi bin Mohd. Nor
8. Melaka: Ir. Nur Fazil Noor Mohamed
9. Sarawak: Ir. Haidel Heli
10. Sabah: Ir. Tan Koh Yon
11. Miri: Ir. Steven Chin Hui Seng
12. Pahang: Ir. Tuan Haji Ahmad Kamal bin Kunji

AHLI JAWATANKUASA INFORMASI DAN PENERBITAN / STANDING COMMITTEE ON INFORMATION AND PUBLICATIONS 2014/2015
Pengerusi/Chairman: Ir. Prof. Dr Lee Teang Shui
Naib Pengerusi/Vice Chairman: Ir. Dr Tan Chee Fai
Setiausaha/Secretary: Ir. Lau Tai Onn
Ketua Pengarang/Chief Editor: Ir. Prof. Dr Lee Teang Shui
Pengarang Buletin/Bulletin Editor: Ir. Mohd. Khir Muhammad
Pengarang Prinsipal Jurnal/Principal Journal Editor: Ir. Prof. Dr Dominic Foo Chwan Yee
Pengerusi Perpustakaan/Library Chairman: Ir. C.M.M. Aboobucker
Ahli-Ahli/Committee Members: Y.Bhg. Datuk Ir. Prof. Dr Ow Chee Sheng, Engr. Abdul Fattah bin Mohamed Yatim, M.I.E.M., Ir. Dr Kannan a/l M. Munisamy, Ir. Siow Yun Tong, Ir. Chin Mee Poon, Ir. Yee Thien Seng, Ir. Tu Yong Eng, Ir. Ong Guan Hock, Engr. Aida Yazrin Mohd. Khairi, Engr. Kok Jing Shun

LEMBAGA PENGARANG/EDITORIAL BOARD 2014/2015
Ketua Pengarang/Chief Editor: Ir. Prof. Dr Lee Teang Shui
Pengarang Buletin/Bulletin Editor: Ir. Mohd. Khir Muhammad
Pengarang Jurnal/Journal Editor: Ir. Prof. Dr Dominic Foo Chwan Yee
Ahli-ahli/Committee Members: Ir. Ong Guan Hock, Ir. Lau Tai Onn, Ir. Yee Thien Seng

(IEM Secretariat: Pamela Jitab, May Lee)

THE INSTITUTION OF ENGINEERS, MALAYSIA
Bangunan Ingenieur, Lots 60 & 62, Jalan 52/4, P.O. Box 223, (Jalan Sultan), 46720 Petaling Jaya, Selangor Darul Ehsan.
Tel: 603-7968 4001/4002 Fax: 603-7957 7678
E-mail: sec@iem.org.my Homepage: http://www.myiem.org.my

CONTENTS

IEM DIARY OF EVENTS

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.

7th International Conference on Cooling & Heating Technologies 2014 (ICCHT 2014)

4th – 6th November 2014

Innovation And Sustainability In Heating & Cooling Technologies

Venue : Dorsett Grand Subang Hotel, Subang Jaya, Selangor

TYPE	REGISTRATION FEE	
	Normal (after 30 Sept 2014)	Early Bird (30 Sept 2014 or before)
Full Delegate	US$500 (RM1,600.00)	US$450 (RM1,440.00)
Student	US$350 (RM1,120.00)	US$300 (RM960.00)
Accompany guest	US$200 (RM640.00)	

For more information, please contact ICCHT 2014 Secretariat
Tel No : +(603) 7958 6851 Fax No: +(603) 7958 2851
E-mail : iemtrainingcentre@iemtc.com
Website: http://www.myiem.org.my/ICCHT2014

DIMENSION PUBLISHING SDN. BHD. (449732-T)

Level 18-01-03, PJX-HM Shah Tower,
No. 16A, Persiaran Barat,
46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia.
Tel: +(603) 7493 1049 Fax: +(603) 7493 1047
E-mail: info@dimensionpublishing.com
Website: www.dimensionpublishing.com

Chairman ROBERT MEBRUER

CEO/Publisher PATRICK LEUNG

General Manager SHIRLEY THAM
shirley@dimensionpublishing.com

Business Development Manager JOSEPH HOW
joseph@dimensionpublishing.com

Editor TAN BEE HONG
bee@dimensionpublishing.com

Writer ARMAN PFORDTEN
pfordten@dimensionpublishing.com

Senior Graphic Designer SHIRLEY GINYAM
sleybeti@dimensionpublishing.com

Graphic Designer NABEELA AHMAD
beela@dimensionpublishing.com

Accounts cum Admin Executive YONG YEN YIN
yenyin@dimensionpublishing.com

For advertisement placements and subscriptions, please contact:
DIMENSION PUBLISHING SDN. BHD. (449732-T)
at +(603) 7493 1049, or E-mail: info@dimensionpublishing.com

Subscription Department
E-mail: subscription@dimensionpublishing.com

Printed by
HOFFSET PRINTING SDN. BHD. (667106-V)
No. 1, Jalan TPK 1/6, Taman Perindustrian Kinrara,
47180 Puchong, Selangor Darul Ehsan, Malaysia.
Tel: +(603) 8075 7222 Fax: +(603) 8075 7333

Mailer
PERFECT MAIL SERVICES. (648839-P)
14 Jalan TSB 2, Taman Perindustrian Sungai Buloh,
Sungai Buloh, Selangor Darul Ehsan, Malaysia.
Tel: +(603) 6156 5288

JURUTERA MONTHLY CIRCULATION: 30,000 COPIES

Submission or placement of articles in JURUTERA could be made to the:-

Chief Editor
THE INSTITUTION OF ENGINEERS, MALAYSIA (IEM)
Bangunan Ingenieur,
Lots 60 & 62, Jalan 52/4, P.O. Box 223 (Jalan Sultan),
46720 Petaling Jaya, Selangor.
Tel: +(603) 7968 4001/4002 Fax: +(603) 7957 7678
E-mail: pub@iem.org.my or sec@iem.org.my
IEM Website: http://www.myiem.org.my

© 2014, The Institution of Engineers, Malaysia (IEM) and Dimension Publishing Sdn. Bhd.

PUBLICATION DISCLAIMER

The publication has been compiled by both IEM and Dimension with great care and they disclaim any duty to investigate any products, process, services, designs and the like which may be described in this publication. The appearance of any information in this publication does not necessarily constitute endorsement by IEM and Dimension. There is no guarantee that the information in this publication is free from errors. IEM and Dimension do not necessarily agree with the statement or the opinion expresssed in this publication.

COPYRIGHT

JURUTERA Bulletin of IEM is the official magazine of The Institution of Engineers, Malaysia (IEM) and is published by Dimension Publishing Sdn. Bhd. The Institution and the Publisher retain the copyright over all materials published in the magazine. No part of this magazine may be reproduced and transmitted in any form or stored in any retrieval system of any nature without the prior written permission of IEM and the Publisher.

Climate Change and Global Warming

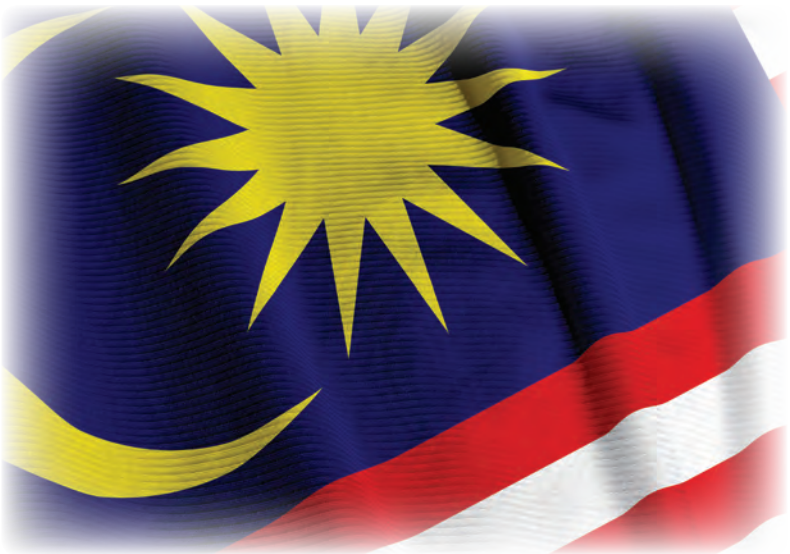
by ***Captain Ir. Fan Hong Poh***
Chairman,
IEM Environmental Engineering Division

SINCE the end of the 20th Century and the beginning of the 21st Century, global warming and climate change has been a bane in all societies throughout the world. The causes of this phenomenon have been largely due to human activities in the last 150 years which contributes increasing concentrations of greenhouse gases in the atmosphere. The International Panel on Climate Change (IPCC) in their 2013 findings reported that the largest driver of global warming is carbon dioxide (CO_2) emissions from fossil fuel combustion, cement production and land-use changes such as deforestation. They have indicated that in the 21st century, the global surface temperature is likely to rise a further 1.1 to 2.9°C for their lowest emissions scenario to 2.4 to 6.4°C for the highest. This is alarming as the effects of this global warming have been felt in all corners of the world.

Malaysia is no exception to these effects as witnessed by the exceptional rainfalls and floods at the end of 2013 and early 2014, to be followed by an unusual drought in February and March 2014.The drought in the Peninsular has caused our water reservoirs to run dry, resulted in the authorities having to impose water rationingcausing much inconvenience and disruptions to our daily lives.

Although the country has been a signatory to the *United NationsFramework Convention on Climate Changein* 1993 and the Prime Minister had made a pledge inthe *Climate Change Conference in Copenhagen* in 2009to reduce Malaysia's CO2 intensity by 40% by the year 2020 as compared to 2005 levels, much need to be done to realize this target. As engineers, we have a responsibility to our present and future generations to ensure reduction of greenhouse gases. As policy makers and project implementers, engineers have the ability to incorporate appropriate measures in their designs and construction that can contribute to the reduction or mitigation of greenhouse emission. I hope our engineers will take up this challenge to help Malaysia achieving this goal. ■

Ir. Fan Hong Poh is currently the Chairman of IEM Environmental Engineering Division.



Wishing all members and readers "Happy Merdeka Day 2014!....

Malaysia's Climate Change Policy and Actions

by Dr Lian Kok Fei

BACKGROUND

Malaysia's National Policy on Climate Change defines climate change *as any change in climate over time that directly and indirectly affects humans and their activities as well as natural systems and processes*.

Climate change is an issue that has serious implications on all countries' development efforts. Climate change has led to increased exposure to drought, floods, sea level rise and diseases which can have adverse socio-economic effects on countries' development trajectories. In the case of Malaysia, the Second National Communications has identified, among others, the following impacts of climate change:

i. Water shortages for irrigation, domestic and industrial use and deterioration in the quality of river water;
ii. Higher rainfall and extreme flows increase the severity of floods in affected areas whilst increasing the likelihood of floods in presently unaffected areas;
iii. Oil palm yields decrease by approximately 30 percent should temperatures increase 2°C above optimum levels and rainfall decrease by 10 percent; and
iv. Increases in temperatures and changes in rainfall will contribute to increase the spread of vector borne diseases like malaria and dengue.

It is clear that Malaysia as a developing country must continue on its development path while addressing the adverse impacts of climate change. Indeed, Malaysia's Prime Minister had already announced in 2009 during the Fifteenth Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change in Copenhagen that Malaysia would reduce its greenhouse gas emissions intensity of Gross Domestic Product (GDP) by up to 40% of 2005 levels by 2020.

To guide the actions on climate change within the country, the Ministry of Natural Resources and Environment (NRE) drafted a National Policy on Climate Change with assistance from Universiti Kebangsaan Malaysia.

THE NATIONAL POLICY ON CLIMATE CHANGE

The policy, launched in November 2009 by the Deputy Prime Minister of Malaysia Tan Sri Muhyiddin Yassin, recognises the cross-sectoral nature of climate change, since it involves more than environmental issues and affects also economic growth and human's well-being. It aspires to ensure climate-resilient development to fulfill national aspirations for sustainability with three objectives:

i. Mainstreaming climate change through wise management of resources and enhanced environmental conservation resulting in strengthened economic competitiveness and improved quality of life;
ii. Integration of responses into national policies, plans and programmes to strengthen the resilience of development from arising and potential impacts of climate change; and
iii. Strengthening of institutional and implementation capacity to better harness opportunities to reduce negative impacts of climate change.

ACTIONS ON CLIMATE CHANGE

Many actions have been taken towards climate resilient development in line with the objectives of the National Policy on Climate Change. Among them are the following:

THE NATIONAL GREEN TECHNOLOGY & CLIMATE CHANGE COUNCIL (MTHPI)

The National Green Technology and Climate Change Council (MTHPI) is the institutional framework to formulate strategies and policies relating to green technology and climate change in Malaysia. The Council is served by the joint secretariat under the Ministry of Energy, Green Technology and Water (KeTTHA) and the Ministry of Natural Resources and Environment (NRE).

Specifically, the functions of the MTHPI are to:

i. determine the policies and directions of green technology and climate change;
ii. identify strategic issues to advance green technology in the country;
iii. coordinate issues relating to green technology and climate change at the national level; and
iv. monitor and evaluate the effectiveness of policies relating to green technology and climate change in the country.

The membership of the council is made up of:

i. Ministers from relevant ministries, including Energy, Green Technology and Water; Natural Resources and Environment; Transport; Science, Technology and Innovation and Housing and Local Government;
ii. The Chief Secretary to the Government;
iii. The Secretaries-General of the Ministry of Energy, Green Technology and Water and the Ministry of Natural Resources and Environment and the Chief Executive Officer of Green Technology Corporation
iv. The Chairmen of the eight working committees established under the council.

The eight working committees, established with specific focus areas to assist the MTHPI and involving other stakeholders including the private sector and agencies are as follows:

i. Industry Working Committee;
ii. Human Capital Working Committee;
iii. Research and Innovation Working Committee;
iv. Promotion and Public Awareness Working Committee;
v. Transportation Working Committee;
vi. Green Neighbourhood Working Committee;
vii. Adaptation Working Committee; and
viii. Green Development Working Committee.

The MTHPI plays an important role in ensuring that policies, measures and actions are implemented on green technology and climate change in the country. Among the issues that have been discussed in the council and its committees are green townships, generation of electricity from biomass, roadmap to achieve greenhouse gas reduction, refuse derived fuel waste to energy and financing of green projects.derived fuel waste to energy and financing of green projects.

THE ENVIRONMENTAL PERFORMANCE INDEX FOR MALAYSIA (EPI)

The Environmental Performance Index (EPI) was jointly developed by Yale University and Columbia University and published biennially at the World Economic Forum since 2006. It is a measure of countries' environmental performance on a wide range of environmental indicators. The use of such an indicator will help Malaysia to make better decisions on the environment.

The EPI for Malaysia was developed by NRE in collaboration with Universiti Teknologi Malaysia (UTM) in order to provide Malaysian policy makers with a data driven decision making tool in the field of environment.

It focuses on three broad environmental objectives:

i. Reducing environmental stresses on human health;
ii. Promoting ecosystem vitality; and
iii. Promoting socioeconomic sustainability.

The environmental health objective is weighted at 31.4% and captures the policy categories of environmental burden of disease, water effects on human, air pollution effects on human and waste.

The ecosystem vitality objective is weighted at 50.7% and captures seven policy categories: air pollution effects on ecosystem, water effects on ecosystem, biodiversity and habitats, forest and urban green areas, fisheries, agriculture and landuse and climate change.

The socioeconomic sustainability objective is weighted at 18% and includes the following policy categories: resource efficiency, environmental awareness and behavior, and environmental governance.

For all the policy categories, indicators have also been developed to capture relevant data.

The EPI for Malaysia will rank states in terms of their environmental performance. It is an important tool in contributing to the objectives of the National Policy on Climate Change because apart from tracking climate change, it also captures the policy categories that contribute to climate change.

THE LOW EMISSIONS CAPACITY BUILDING (LECB) PROJECT

The Low Emission Capacity Building (LECB) Project aims at assisting Malaysia in enhancing national greenhouse gas (GHG) inventory systems, promoting the uptake of nationally appropriate mitigation actions (NAMA) as well as designing measurement, reporting, and verification (MRV) framework that ultimately serves national priorities for Low Emission Development Strategies (LEDS). It would be implemented in 2013-2015 with the support of United Nations Development Programme.

The Project organized the Introductory Workshop on Nationally Appropriate Mitigation Actions (NAMAs) on 29-30 July 2013 to introduce NAMAs to the stakeholders by providing an insight on NAMA from the international, regional and national perspectives. Two Focus Group Discussions on NAMAs were then held on 4-6 October 2013 and 13 December 2013, respectively. The first Technical Working Group on NAMA Meeting was held on 1 April 2014. The Project outlined options of the potential

national framework and arrangement for managing NAMAs in the country. The proposed institutional arrangement includes a NAMA Committee, a Secretariat and an Expert Group. The NAMA Committee may have several functions related to policy, technical and institutional aspects, while the Secretariat will support the NAMA Committee in its work and the Expert Group is suggested as an ad hoc group of specialists and experts to be selected and appointed as and when necessary.

THE CLEAN DEVELOPMENT MECHANISM (CDM)

At the global level, countries have become members of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to address climate change.

The Clean Development Mechanism (CDM) is one of the flexible mechanisms under the Kyoto Protocol that allows industrialised countries to implement emission-reduction projects in developing nations. Malaysia ratified the protocol on 4 September 2002. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO2, which can be counted towards meeting Kyoto targets. It is the first global, environmental investment and credit scheme of its kind, providing a standardized emission offset instrument, CERs. A CDM project activity might involve, for example, a rural electrification project using solar panels or the installation of more energy-efficient boilers.

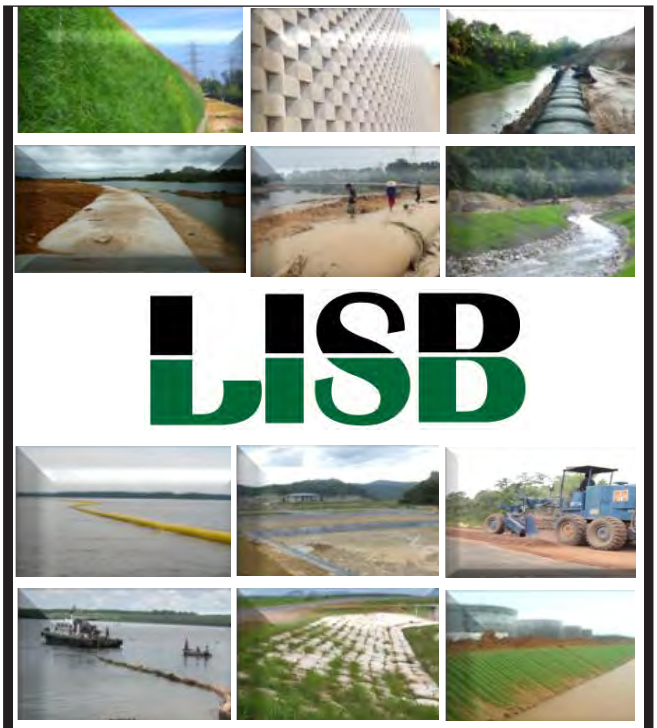
The mechanism stimulates sustainable development and emission reductions, while giving industrialized countries some flexibility in how they meet their emission reduction or limitation targets at a lower cost than if the emissions were done in the industrialised countries.

CDM projects must meet measurable environmental criteria and be in line with a developing country's development priorities. A total of 44 projects have been issues CERs (i.e. 39 projects under energy sector and 5 projects under agriculture sector) with accumulative CER issuance as of 31 December 2013 of 7,823,487 tCO_2E.

GREEN TECHNOLOGY FINANCING SCHEME (GTFS)

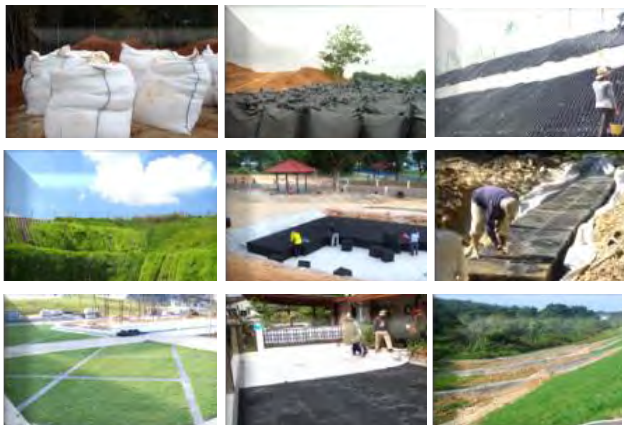
In the budget speech for 2010, the Prime Minister announced the establishment of Green Technology Financing Scheme (GTFS) as an effort to improve the supply and utilization of green technology. The scheme would benefit companies which produce and use green technology. As a sign of commitment, the Government will bear 2% of the total interest/profit rate. In addition, the Government will provide a guarantee of 60% on the financing amount via Credit Guarantee Corporation Malaysia Berhad (CGC), with the remaining 40% financing risk to be borne by participating financial institutions (PFIs).

The Prime Minister also appointed Malaysia Green Technology Corporation (MGTC) as the conduit for the Green Technology Financing Scheme (GTFS) application. The scheme is expected to provide benefits to producers and users of green technology. The approved value for financing is more than RM 1,928 billion.



LISB

Civil, Geotechnical, Hydraulic, Marine and Landfill Engineering
Soil Stabilization, Earthworks, Erosion Control



Our Services
- ✓ *Slope Repair*
- ✓ *Reinforced Soil Wall*
- ✓ *Keystone Wall*
- ✓ *Soft Soil Stabilization*
- ✓ *River Bank Protection*
- ✓ *Slope Erosion Control*
- ✓ *Flood Mitigation*
- ✓ *Coastal Protection*
- ✓ *Silt & Sediment Control*
- ✓ *Landfills*
- ✓ *On-site Detention System*
- ✓ *Earthworks*
- ✓ *Infrastructures*

Our Products
- ✓ *Turf Reinforcement Matrix*
- ✓ *Erosion Control Blanket*
- ✓ *Coirlog & Straw Watters*
- ✓ *Profix Sandfilled Mattress*
- ✓ *Geocell / Geoweb*
- ✓ *High Strength Geotextile*
- ✓ *Nonwoven Geotextile*
- ✓ *Polyester Geogrid*
- ✓ *Geocomposite / Geofabric*
- ✓ *Gabion & Gabion Mattress*
- ✓ *HDPE Geomembrane*
- ✓ *Geosynthetic Clay Liner*
- ✓ *Chemilink*

LANDASAN IMPIAN SDN BHD (CO. NO. 860015-T)
No 12-1 & 12-2, Jalan BPP 5/3, Pusat Bandar Putra Permai,
43300 Seri Kembangan, Selangor Darul Ehsan, Malaysia.
Tel: 03-8943 8598 Fax: 03-8943 8591
Design (Ching): 016-215 5531 Project (Teo): 016-233 5531
Email: landasanimpian@gmail.com

THE FEED-IN TARIFF (FIT)

A feed-in tariff (FiT) is a policy mechanism designed to accelerate investment in renewable energy technologies. Under a FiT, eligible renewable electricity generators, including homeowners, business owners, farmers and private investors, are paid a cost-based price for the renewable electricity they supply to the grid. This enables diverse technologies (wind, solar, biogas, etc.) to be developed and provides investors a reasonable return. Malaysia's Feed-in Tariff (FiT) system obliges Distribution Licensees (DLs) to buy from Feed-in Approval Holders (FIAHs) the electricity produced from renewable resources (renewable energy) and sets the FiT rate. The DLs will pay for renewable energy supplied to the electricity grid for a specific period.

By guaranteeing access to the grid and setting a favourable price per unit of renewable energy, the FiT mechanism would ensure that renewable energy becomes a viable and sound long-term investment for companies, industries and also individuals.

MYCARBON

The corporate sector plays an important role in reporting and reduction of greenhouse gas (GHG) emissions. Globally, corporate reporting of GHG emissions is an important element of national sustainability strategies.

By accounting for its GHG emissions, the corporate sector can enjoy many benefits including the following:

i. Review resource and process efficiency and identify potential savings such as reducing electricity inputs;
ii. Increase competitive advantage through greater efficiency;
iii. Increase transparent communication with stakeholders; and
iv. Fulfil goals in social corporate responsibilities.

Corporate reporting of GHG emissions is already regulated by law in developed nations such as the United Kingdom, Canda, Jaopan, Australia and France.

National Corporate GHG Reporting Programme for Malaysia, commonly referred as MYCarbon, has been initiated by the Ministry of Natural Resources and Environment with support from the United Nations Development Programme. The programme was officially launched on 14th August 2013.

The main objectives of MYCarbon are:

i. To set up a globally recognised, standard GHG accounting and reporting programme in Malaysia;
ii. To encourage corporate level carbon accounting and emissions reductions; and
iii. To provide standards, guidance and support measures (training, fiscal and other incentives)

The outcome targeted from MYCarbon is GHG reporting and management system that contributes towards national mitigation initiatives and sustainable development goals. The programme is in-line with the National Climate Change Policy, Malaysia's voluntary indicator to reduce greenhouse gas emissions intensity of Gross Domestic Product (GDP) by up to 40% of 2005 levels by 2020 and other national policies to reduce greenhouse gas emissions.

The pilot stage of MYCarbon implementation (2013-2015) started in August 2013. The pilot stage will be voluntary in nature to provide sufficient time for building awareness and for corporate sectors to build sufficient capacity before any future mandatory reporting.

The pilot phase will also allow the framework, guidance document to be tested and refined before full implementation. Approximately 20 pilot organisations representing various sectors are expected to participate in the 1st round of reporting in 2014. The numbers may be increased to 40-50 organisations by 2015 but is still based on the voluntary approach.

THE LOW CARBON CITIES' FRAMEWORK (LCCF)

The LCCF was developed by Ministry of Energy, Green Technology & Water Malaysia together with GreenTech Malaysia in collaboration with the Malaysian Institute of Planners in 2010 - 2011. LCCF was developed under the Green Township Project. It was endorsed as a government tool to facilitate the development of Low Carbon Cities in Malaysia, which is based on actual performance of carbon reduction.

The four main areas in the LCCF are urban environment, urban transportation, urban infrastructure and buildings.

The first phase of the LCCF project involves cities such as Iskandar Malaysia in Johor Bahru, Hang Tuah Jaya in Malacca, Petaling Jaya in Selangor and Miri in Sarawak.

CONCLUSION

Many initiatives have already been initiated by the Government to address climate change. Such initiatives must be continued and further enhanced in the years to come as the adverse effects of climate change are already with us. National development priorities need to take into account the realities of climate change. ■

Dr Lian Kok Fei is the Under-Secretary of the Environmental Management and Climate Change Division at the Ministry of Natural Resources and Environment (NRE). Prior to NRE, he had served at the International Institute of Public Policy and Management (INPUMA) at the University of Malaya, National Institute of Public Administration (INTAN), Ministry of Housing and Local Government and Ministry of Human Resources. He is, among others, the National Focal Point for the United Nations Framework Convention on Climate Change (UNFCCC) and the National Focal Point for the Intergovernmental Panel on Climate Change (IPCC).

Forests, Climate Change and The Un-Redd

by Engr. Dr Vasanthi Sethu, Grad.IEM

INTRODUCTION

Forests play an important role in life, as they are home to flora and fauna, protect land and water resources, produce oxygen, provide food and shelter and control various geochemical cycles. Besides providing vital ecosystem services globally, forests also support the livelihood of millions of people throughout the world. The importance of forests has long been emphasized by scientists, foresters and proponents of sustainable forest management. Today, their significance has been further underlined by the recognition of their contribution towards global climate regulation (Hall, 2012). This is because forests play a major role in governing the balance of greenhouse gases (GHGs) in the atmosphere that contribute towards climate stability.

GHGs refer to those gases that capture and retain heat from solar radiation in the atmosphere. Examples include carbon dioxide, methane, nitrous oxides and water vapour. When solar rays come in, they are in the form of short-waved radiation that is transparent to most GHGs. This radiation reaches the Earth's surface, heats it, and re-radiates as long-waved radiation. Since GHGs are opaque to the outgoing long-waved radiation, heat is trapped in the atmosphere. This exchange of incoming and outgoing radiation is called the "greenhouse effect", because it works very much like a greenhouse which retains heat. The natural greenhouse effect is important as it helps maintain Earth's temperature at about an average of 15^0C, a level that is comfortable and suitable to sustain life on this planet.

CLIMATE CHANGE

Problems arise when there is too much of GHGs in the atmosphere. Human activities have contributed to the release of excessive GHGs that trap unnecessary amounts of heat on earth. The most prominent ones are carbon dioxide and methane which over the past two centuries have caused an imbalance in the overall global temperature. The increase in carbon dioxide is attributed mainly to the burning of fossil fuels and land-use change such as deforestation and forest degradation, while those of methane are a consequence of agricultural activities. When there are excessive GHGs, the enhanced greenhouse effect takes place, and it leads to global climate change, primarily global warming.

Dire consequences have come about as a result of climate change, especially in developing countries. The rise of sea levels due to the melting of glaciers and polar ice caps, the acidification of oceans due to excess carbon dioxide gas, and the intensification of extreme weather conditions such as droughts, floods, storms and cyclones are all results of climate change. This can lead to the faster extinction of species, inundation of coastal lands and population displacements, declining agricultural productivity, water scarcity and increasing deaths from growing food insecurity problems (Stern, 2007).

Carbon dioxide, the main culprit of global climate change, is the much debated about GHG. The reasons are because of its abundant amounts released, plus its ability to stay in the atmosphere for thousands of years. Although methane is a more potent GHG, its concentration is very much lower and it stays in the atmosphere for only 10 years. Thus, carbon dioxide is widely accepted as the prime cause of today's global climate change issues. During the pre-industrial era, the global concentration of carbon dioxide in the atmosphere was about 280 ppm (based on the recordings at the Mauna Loa observatory). Today, the level is at 430 ppm, and the Intergovernmental Panel on Climate Change (IPCC) predicts it to rise to about 450 - 550 ppm in the year 2050. As a consequence, there could be a rise of 2 to 3°C in the global mean temperature in the next 30 years if the current emission rates continue (IPCC, 2007).

Climate change may be mitigated by removing surplus amounts of carbon dioxide in the atmosphere by means of capture and sequestration. This can be carried out by channeling the gas into natural sinks like water bodies, soils and plants that are able to store the gases. It is also possible to channel carbon dioxide into artificial sinks, but the process may not be economically feasible due to the very large amounts of the gas that needs to be captured. Natural sinks are better, as they entail minimal economic and environmental cost. Two of the largest natural carbon sinks are oceans and forests. Oceans are able to take up large amounts of carbon dioxide, but they have limited capacity. Too much of carbon dioxide in the oceans also cause water acidification and harm aquatic life. Forests seem to be a better solution.

CURRENT STATUS OF FORESTS

Forests account to about 30% of earth's total land area, with the Russian Federation, Brazil, Canada, United States and China having the largest coverage areas (FAO, 2011). Of this, primary forests account to about 36%, followed by secondary forests and other types of vegetation. According to the Millennium Ecosystem Assessment (2003), the chief roles of forests may be classified into four categories, which include (i) supporting (biodiversity conservation, soil

formation and water cycling); (ii) regulating (climate, hydrology, nutrients and carbon); (iii) provisioning (supply of timber and non-timber related products); and (iv) cultural services (non-use values and landscape beauty). At the moment, 15 out of 24 of the services examined are being seriously compromised (World Bank, 2010). It is a matter of fact that the maintenance of all ecosystem services is vital for the future, but the regulatory role of forests in sequestering carbon to mitigate climate change is the focus of the present discussion, due to the social, economic and environmental impacts.

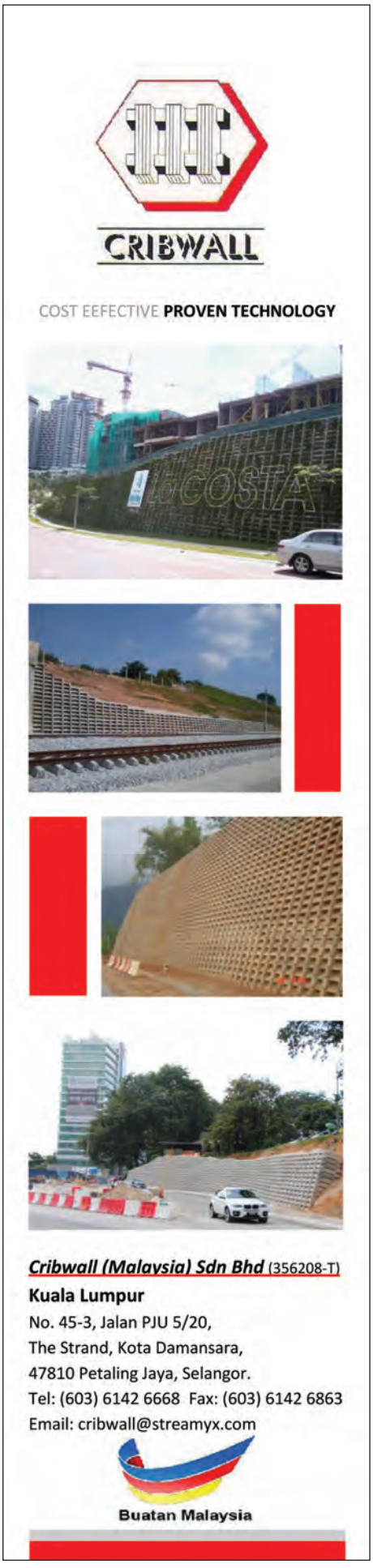
Forests have a very close relationship with the carbon cycle. They hold more than half of the world's terrestrial carbon, which accounts to about 289 gigatonnes (Gt) of carbon stored in their biomass. This compares with about 1,500 Gt carbon in the world's soils and about 730 Gt carbon in the atmosphere (IPCC, 2007). Forests help to balance the carbon cycle by acting as massive storehouses of carbon, both in their vegetation and soil. Forest trees are able to take up large amounts of carbon dioxide from the atmosphere and store it as carbon in their leaves, branches, trunks, roots and fruits. Smaller plants and agricultural crops also store carbon, but mature forests are able to store up to a hundred times more carbon. One tonne of carbon in trees is the result of removal of 3.67 tonnes of carbon dioxide from the atmosphere (Prentice, et al., 2001). Thus, with such large coverage area and capacity to store carbon, forests seem to the most feasible solution for combating global warming. It is cost effective and environmentally friendly as well. However, only a small proportion of this potential is being realised due to the ever increasing deforestation and forest degradation activities for social and economic development.

DEFORESTATION AND FOREST DEGRADATION

Deforestation is a process where forests are cleared by human activities and the land is converted for non-forest uses, such as agriculture or urban development. Forests can also be reduced through degradation, which is defined as the decrease of density or increase of disturbance in forest classes. It may be caused by natural disasters like volcanic eruptions, or fires that make the area unfit for natural regeneration. Deforestation and degradation terms are best used together, where they effectively refer to the carbon accounting stock. When forests are destroyed via deforestation and degradation, the carbon stored is released into the atmosphere as carbon dioxide gas. In order to balance the carbon released, an equal mass of carbon has to be absorbed. This can be achieved through replanting forests, where the forest returns to its original biomass and soil organic carbon status. The process of replenishing forests is known as afforestation or reforestation. Afforestation is the growing of trees on land that was not previously forested, while reforestation refers to the growing of trees on land that was previously forested. Reforestation can be intentional, where humans replant forests, or natural, where a secondary forest grows by itself over time. At a particular time and place, the total forest coverage area depends on the net balance between forestation and deforestation.

GOVERNANCE

Recent figures from IPCC show that land-use change and forestry account for around 18% of global carbon dioxide emissions, after the power sector (26%) and industry (19%). Other sources are agriculture (14%) and transportation (13%). In relation to this, it is estimated that more than 1.5 billion tonnes of carbon dioxide per year is released to the atmosphere due to deforestation and forest degradation. Today, these figures are significant, but twenty years back, forest-related emissions were not given priority by the Kyoto Protocol (KP) and United Nations Framework Convention on Climate Change (UNFCCC) due to the complexity in getting agreement on forest related GHG emissions management between developing and developed nations. The focus then was on GHG emissions from industrial sources



alone. However today after twenty years, the relative political complexity of focusing on emissions reductions from industrial sources alone followed by the substantially large amounts of emissions from deforestation and forest degradation (12-17%) have led to a return on an emphasis on the crucial role that forests play in combating climate change (Agrawal, et al., 2011). There is sufficient evidence today showing that forest related emissions are much easier to control apart from being more cost effective compared to industrial emission sources (Stern, 2007).

This has led to discussions on a United Nations (UN) programme called REDD – Reducing Emissions from Deforestation and Forest Degradation (**http://www.un-redd.org/**). The idea of UN-REDD is to develop a mechanism that aims at halting deforestation through financial incentives. In simpler terms – if a country agrees to reduce deforestation below a baseline that is agreed to with others, it could receive financial compensation for this effort. The Stern Review, (2007), which discussed this issue in depth, drew much attention of the global community. It stressed on the possible feasibility and cost-effectiveness of implementing forest policies. Many forest scientists also agreed that with proper forest policies and carbon pricing in place, forest related emissions may be reduced significantly by the year 2020 (Rokityanskiy, et al., 2007). This has led to a renewed outlook on the ability of the global community to deal with forests and mitigate their GHG emissions.

Today, REDD is known as REDD+, which goes beyond deforestation and forest degradation to the role of conservation, sustainable management of forests and enhancement of forest carbon stocks. There are 51 partner countries with the REDD+ programme, including Malaysia as one of the countries from the Asia-Pacific region. All participating countries are urged to collect data, estimate their emissions from deforestation and forest degradation, monitor and report the results to address the issue. Malaysia is involved in the "National REDD+ Readiness in Malaysia" project, a joint venture between the United Nations Development Programme (UNDP), the Economic Planning Unit (EPU) and the Ministry of Natural Resources and Environment (NRE). The output would be a national framework aims at enhancing the conservation of natural forests and reduce forest degradation in Malaysia. The project would allow for the implementation of REDD+ at the national level. Our neighbouring countries which have seen the successful implementation of REDD+ include Indonesia and Vietnam. It is indeed timely for Malaysia to follow suit and contribute towards GHG mitigation and environmental protection.

CONCLUSION

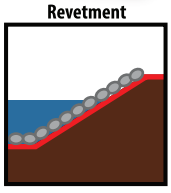
It can be said that deforestation and forest degradation are underlying principle causes of climate change today. Thus, addressing emissions from forests must be part of any solution to reduce GHG emissions nationally as well as globally. It is advantageous to do so as the method is more cost effective and has the potential to offer significant reductions fairly quickly when compared to reducing emissions from industrial sources alone. Moreover, a plus point is that large amounts of carbon may be stored in forest resources when compared to other sequestration methods. For this move to be a success, it would be a wise for developing nations like Malaysia to support and participate in the REDD+ programme, as it is one of the most efficient ways of stabilising the atmospheric concentration of GHGs. We need to reduce our deforestation activities and look into more sustainable forest management options. It is the society's role to play, as we hold a moral obligation towards our country and planet - to safeguard our natural resources and mitigate pollution, for a better future. ■

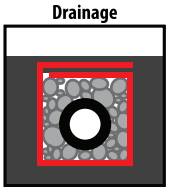
Neusynthetics
(1086519-T)
Built On Integrity
A Nehemiah Group of Companies

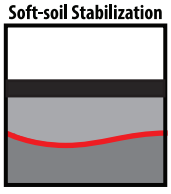
We supply geosynthetic products:

- Nextile NX-Series (non-wovens)
- Nexgrid NG-Series (geogrids)
- Nexforce NF-Series (woven HS)
- Nexbrid NB-Series (composites)

- We provide design, specification, bill of quantities, cost estimate and drawings free of charge.







Get in touch with us:
Lim Yu Jeen (H/P: 012-568 5713)
Tel: 03-6142 6638 (Ext 215)
Fax: 03-6142 6693
sales.enquiry@neusynthetics.com

NEUSYNTHETICS SDN. BHD.
No. 45-3, Jalan PJU 5/20,
The Strand, Kota Damansara,
47810 Petaling Jaya,
Selangor Darul Ehsan.
Malaysia.

www.neusynthetics.com

APPLIED TECHNOLOGY GROUP OF COMPANIES
Australia • New Zealand • Hong Kong • Malaysia • Singapore

Course on Practical Foundation Design and Construction for Tall Buildings

Course Presenter: Dato' Ir. Dr. Gue See Sew

D.S.P.N., D.S.M., Hon.D.Sc, FASc, D.Phil., BSc., Dip., FAAET, Hon.FAFEO ASEAN Eng., Hon FIEM, FICE, FIES, F.W.I.F., MACEM, APEC Eng.,IntPE(My),P.Eng.

- More than 30 years' experience in Geotechnics.
- Managing Director of G&P Geotechnics Sdn. Bhd. and CEO of G&P Professional Sdn. Bhd.
- Past President of the Institution of Engineers, Malaysia (IEM) (2001 to 2003), International Chairman of the Coordinating Committee of APEC Engineer (2001 to 2005, 2007 to 2011), Head Commissioner of ASEAN Engineers Register (AER) (2003 to May 2007) and Board Member of Board of Engineers Malaysia (1993 to 1998, 2000 to 2003).
- Ex-Chairman of the Penang Hillsite Advisory Panel (2011 to 2012).
- Independent Reviewer for Ministry of Science, Technology and Environment on geotechnical issues related to EIA since 1998.
- Presented more than 200 lectures on Geotechnical Engineering and published more than 100 technical papers.
- Awarded Construction Professional of the Year Award in Year 2006.

Benefits of Course

The course will benefit practising civil, structural and geotechnical engineers, contractors and project managers in successful design and construction of foundation for tall buildings based on practical experience and state of art knowledge. The participants will be able to appreciate and apply different construction techniques of foundation design and construction.

Course Outline

- **Session 1: Subsurface Investigation for Tall Buildings**
  -Objectives, stages, scope and planning of subsurface investigation
  -Investigation methods and procedures
  -Interpretation of field and laboratory data for design of tall buildings
- **Session 2: Foundation Design for Tall Buildings (Part 1)**
  -Selection of foundation system
  -Allowable settlement and its effect for Tall buildings
  -Design of raft and piled raft foundation system
- **Session 3: Foundation Design for Tall Buildings (Part 2)**
  -Design of piled foundation
  -Interpretation of pile testing results
- **Session 4: Foundation Construction for Tall Buildings**
  -Methods of foundation construction
  -Importance of site supervision
  -Checklists for foundation supervision
  -Case histories

EARLY BIRD DISCOUNT RM100
Pay Before: 18 September 2014

Date	Venue	
18 OCTOBER 2014	ARMADA HOTEL, PJ	RM1100 (Individual)
Closing Date: 10 OCTOBER 2014		RM1000 (Group)

Please contact Applied Technology Group Sdn Bhd:
Phone: 03-56347905 / 017-328 1097
Email: admin@apptechgroups.net
Fax: 03-56379945

7 BEM Approved CPD-Hours (Ref No.: IEM14/PP/033/C)
10 CIDB Approved CCD-Points (Ref No.: CIDBHQ/C/2014/0426),

REGISTER NOW, limited seats available!
Please visit our website at **www.apptechgroups.net**
for detailed course brochure or other engineering related courses.

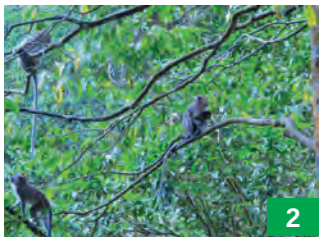


Photo 1-5: *Tropical rainforests – Courtesy of Dr Svenja Hanson, Department of Chemical and Environmental Engineering, University of Nottingham Malaysia Campus*

REFERENCES

[1] Agrawal, A., Nepstad, D. and Chhatre, A. (2011), Reducing emissions from deforestation and forest degradation, *Annual Review of Environmental Resources* 36, 373-396.

[2] FAO, (2011), *State of the World's Forests 2011*, Rome: FAO

[3] Hall, A., (2012), *Forests and Climate Change – The Social Dimensions of REDD in Latin America*, EE Publishing Ltd.

[4] IPCC (2007), *Climate Change 2007: The Physical Science Basis, Contribution of Working Group 1 to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Summary for Policymakers*, Geneva: IPCC.

[5] MEA, Millennium Ecosystem Assessment (2003), *Ecosystems and Human Well-being: A Framework for Assessment*, Washington DC: Island Press

[6] Prentice, C., G. Farquhar, M. Fasham, M. Goulden, M. Heimann, V. Jaramillo, H. Kheshgi, C. Le Quere, R. Scholes and D. Wallace (2001), *The Carbon Cycle and Atmospheric Carbon Dioxide, in J. Houghton et al., (eds), Climate Change Assessment Report of the International Panel on Climate Change*, Cambridge: Cambridge University Press.

[7] Rokityanskiy, D., Benitez, P., Kraxner, F., McCallum, F., Obersteiner, M., Rametsteiner, E., and Yamagata, Y. (2007), Geographically explicit global modeling of land-use change, carbon sequestration and biomass supply, *Technological Forecasting and Social Change* 74 (4), 1057-82.

[8] Stern, N., (2007), T*he Economics of Climate Change: The Stern Review*, Cambridge: Cambridge University Press.

[9] World Bank, (2010), *World Development Report 2010*, Development and Climate Change, Washington DC: World Bank.

[10] http://www.un-redd.org/ Accessed on 9th June 2014

Engr. Dr Vasanthi Sethu is an Assistant Professor in the Department of Chemical and Environmental Engineering, University of Nottingham Malaysia Campus. She received her BEng and MEngSc in Chemical Engineering from the University of Malaya, and PhD from the University of Nottingham. Her research interests include carbon management, climate change and water/wastewater related technologies. People with research interest in the similar area are welcome to provide feedback.

Management System Standards: Purpose Processes and Issues

Examples From Recent ISO Management System Standards

by Ir. Hussein Rahmat

INTRODUCTION

Do you ever wonder why some standards are published whilst others that you think useful are not? Why some standards appear much earlier - ISO 9001 Quality Management System Standard was published in 1987 whilst ISO 14001 Environmental Management System Standard was published about ten years later in 1996. Why an international standard on occupational health and safety management system is only now being considered by ISO (International Organization for Standardization)? This article attempts to explain in a nutshell an overview of international management system standards in particular and what are the issues and the processes surrounding their publications. The author will explain this from his first-hand experience through involvements with ISO standards committees from the early 1990s with ISO 14001 Environmental management System Standard until recently with ISO 45001 Occupational Health and Safety Management System Standard.

STANDARDS

Standards have existed and have served mankind since ancient times. King Henry I of England standardized measurement in 1120 AD by instituting the *ell*, which was equivalent to the length of his arm[1]. In ancient China there were standards for beauty: *Slender Beauty in the Han Dynasty vs. Plump Beauty in the Tang Dynasty2*. The Industrial Revolution accelerated the need for standards when machines were invented and railways were constructed. The railroad as a fast, economical and effective means of sending products cross-country was made possible by the standardization of the railroad track gauge1. The Whitworth screw thread standard - the world's first national screw thread standard – was first devised and specified by Joseph Whitworth in 1841. This standard goes a long way towards compatibility of machines and equipment.

A technical standard is a formal document that establishes a norm or a requirement. Thus you will find the following types of standards are available:

1. A standard specification: A set of requirements for an item, material, component, system or service. e. g. ITU V.34 : A modem operating at data signalling rates of up to 33,600 bit/s for use on the general switched telephone network and on leased point-to-point 2-wire telephone-type circuits;
2. A standard test method: A description of a testing procedure that will provide comparable result. e.g. ASTM F37-06(2013) Standard Test Methods for Sealability of Gasket Materials);
3. A standard practice or procedure: A set of instruction for performing an operation or function. e.g. BS 8887-1:2006 Design for manufacture, assembly, disassembly and end-of-life processing (MADE). General concepts, process and requirements;
4. A management system standard: Describes the set of processes and procedures an organization needs to follow in order to meet its objectives e.g. ISO 14001 Environmental management System Standard, ISO 45001 Occupational Health and Safety Management System Standard;
5. Standard units: Commonly accepted measurements of physical quantities. e.g. The Système International d'Unités (SI). The seven SI are the metre for length, kilogram for mass, second for time, ampere for electric current, kelvin for temperature, candela for luminous intensity and mole for the amount of substance; and
6. Standard definition.

A standard is usually developed through a consensus process among the relevant stakeholders of standards bodies (e.g. SIRIM) or unilaterally by institutions or corporations. As an example of the latter was when American Petroleum Institute (API) publishes extensive standards and guidelines for all phases of the industry or when IBM and Microsoft provided specifications for personal computers.

Standards are frequently revised as new technology, knowledge, needs and application changes over the time. ISO standards have to be reviewed in every five years either for these to be reaffirmed, withdrawn or revised. Similarly, Malaysian Standards MS 1722 Occupational Safety and Health Management System standard, for example, first published in 2003, was amended and re-published in 2005 and again in 2011.

BENEFITS OF STANDARDS

The benefits of technical standards are threefold. Standards engender efficiency, reliability and safety. It enables industry to mass produce products. With standards, both businesses and consumers derive benefits. Consumers have choices of products and suppliers, ease of maintenance, compatibility and interoperability of products and finally more consistent, reliable and safer products. For businesses, standards

allow them open access to markets, encourage innovation or enhancements of existing technologies, the development of new technologies and lastly provide economies of scale. With standardization, businesses and industries do not have to invent new solutions for commonly used items. Even governments derive some benefits from standards to specify regulations.

As with any standard, an effective management system standard offers many benefits: A more efficient resource use; reliability in meeting the organization's objectives including quality and compliance (legal, contractual, etc.); improved risk management; increased organisation's values through customer and stakeholder satisfactions; continual improvements; and enhanced organizational image and reputation.

INTERNATIONAL STANDARDS

International standards help facilitate international trade and reduce the so-called "technical barriers to trade". It also enhances harmony and life convenience such as for international communications, the internet and the credit card system.

International standardization began with the *International Electrotechnical Commission (IEC)* in the electro-technical field in 1906. Prior to this, electricity supply provided by many electrical power companies specify their own standards for voltage, frequency and components such as plugs and sockets and the like. Thus neighbouring houses may have completely incompatible electrical systems.

British Standards Institution (BSI), founded in 1901, was one of the first national standards bodies formed in the world3. In 1946 *British Standards Institution* organised the first ever Commonwealth Standards Conference, in London. This led to the establishment of the *International Organization for Standardization (ISO)*. ISO is the foremost organization in publishing widely accepted standards. There are of course other international institutions which specialised themselves in standards for certain sectors. *The International Telecommunication Union (ITU)*, for example, is responsible for issues concerning information and communication technologies.

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO has a membership of 163 national standards bodies from all over the world including ***Standards Malaysia***. ISO has a portfolio of almost 20,000 standards. The best-known and most widely implemented standards ever are its management system standards. *ISO 9001 Quality Management System* has over a million certifications worldwide, *ISO 14001 Environmental Management System* has more than a quarter of a million certifications implemented in 138 countries, and its *ISO 50001 Energy management systems* is fast gaining a third place in ISO standards implementation[4].

The major works of ISO are done by its 2,700 technical committees, subcommittees and working groups. Each committee and subcommittee is headed by a Secretariat from one of the member organisations. ISO technical committee TC176 is concerned with ISO 9000 series of standards and TC207 is for the ISO 14000 series of standards. Technical committee meetings are hosted by member countries in all parts of the world.

MANAGEMENT SYSTEM STANDARD

History of management system standard

The bulk of technical standards are mostly material specifications based. After the end of World War II, the Department of Defense in the USA recognized the benefits of a management system that had transformed the Japanese manufacturing industry. In 1959 the United States developed Mil-Q-9858a ("Quality Program Requirements") for military procurement. The British Standards Institution (BSI) published the first edition of its BS 5750 series of quality assurance Standards in 19793. In 1987 ISO published its ISO 9000:1987 based on the UK Standard BS 5750. ISO 9000 is a departure for ISO, being the first management system standards published by it. Since then, ISO publishes many more management system standards, of which many are published since year 2000. A current list of ISO management system standard[5] is as follows:

The anatomy of a management system standard

The structure of management system standards today began with the so-called PDCA cycle devised by Dr Walter Shewhart and later championed by Dr Edward Deming[6]. PDCA stands for *Plan, Do, Check* and *Act*. Basically it means to manage any activities you must begin by: planning to achieve your objectives;

ISO 9000	Family of Quality Management
ISO 14000	Family of Environmental Management
ISO 50001	Energy Management
ISO 22000	Food Safety Management
ISO/IEC 27001	Information Security Management
ISO 26000	Social responsibility
ISO 39001	Road traffic safety (RTS) Management Systems
ISO 31000	Risk Management
ISO 20121	Sustainable Events Management
ISO 22301	Societal Security
ISO 45001	Occupational Health and Safety Management (to be published in 2016?)

then implement exactly what you have planned; ensure that you check or analyze the result of your implementation; and act on the information you get from the analysis you performed in the previous step for corrective action and continual improvement. The first ISO management system standard using this concept was *ISO 14001 Environmental Management System* standard.

Standardizing management system standards

As management system standards proliferate, two issues arose. Firstly, many organizations wish to integrate their management systems for efficiency and reliability but the proliferation of standards has caused implementation and documentation problems. Secondly, although the elements of the management standards appear to be the same but there may be subtle contextual differences in meaning and interpretations. This caused a problem in implementation and auditing. To overcome this situation, ISO produces guidelines for standard writers to ensure uniformity of management system standards. The document is called *Annex SL*, formerly known as GUIDE 83, a template for a generic management system that will have a common core text and common terms and core definitions. The overall structure of the standard shall have 10 high level structure clauses:

- Scope
- Normative References
- Terms and Definitions
- Context of the Organisation
- Leadership
- Planning
- Support
- Operation
- Performance evaluation
- Improvement

Some recent standards that conform to Annex SL are ISO 39001 - Road Traffic Safety (RTS) management systems and ISO 31000 - Risk Management. Upcoming revisions of management system standards such as IS0 14001 and ISO 9001 will conform to this structure as well.

Process of writing international standards

The publication of an international standard is the last stage of a long process. The process involves six stages:

Stages of standard development	Document produced
Stage 1: Proposal	New Work Item Proposal (NWIP)
Stage 2: Preparatory	Working Draft (WD)
Stage 3: Committee	Committee Draft (CD)
Stage 4: Enquiry	Draft International Standard (DIS)
Stage 5: Approval	Final Draft International Standard (fDIS)
Stage 6: Publication	International Standard published

How long does it take to write a standard?

Each stage of the processes mentioned above could take three months or more. Indeed *ISO 26000 Social Responsibility Standards* took 5 years to deliver, not inclusive of the two-year Strategic Advisory Group deliberations before its formal development. This is what it takes to gain consensus. Social responsibility is a contentious subject that requires more and longer deliberations to acquire consensus. In practice, draft documents are distributed to participating member bodies and in turn they will organize meetings of their National Mirror Committees to discuss and provide feedback to ISO main committees. ISO meetings are very civil and democratic where every comment will be heard. Consensus is to be achieved; unfortunately this process takes time, partly due to the difficulty of those who already have formed their own opinions to accept others.

International Organization for Standardization is now trying its best to get standards to the market place as quickly as possible. ISO Technical Management Board has directed that standards are to be published within two years to three years upon approval. ISO45001 developments will take three years to complete because it had a late start-up; it is scheduled to be published in 2016.

Competency of ISO to write a management system standard is sometimes questioned

Prior to ISO9001 all ISO standards were technical in nature and were specifications for products, components and their relevant testing and manufacturing methods. ISO 9001 was a departure but at least it was about the manufacturing, design and testing of products and related services. After India's Bhopal disaster in 1984 and *United Nations Conference on Environment and Development (UNCED)* in Rio de Janeiro in 1992, the subject

KLIA PROFESSIONAL & MANAGEMENT COLLEGE

AUTODESK BUILDING INFORMATION MODELLING (BIM) SYSTEM TRAINING
"BIM - Transforming the Construction Industry"

DISCOVER BIM: A BETTER WAY TO BUILD BETTER BUILDINGS

Building Information Modelling (BIM) offers a novel approach to design, construction, and facility management in which a digital representation of the building process is used to facilitate the exchange and interoperability of information in digital format. BIM is beginning to change the way buildings look, the way they function, and the ways in which they are designed and built.

KLIA Professional and Management College, being the premier in Construction, now offers the most comprehensive BIM Training in Malaysia to AEC industry players.

Introduction to BIM (1/2 days)
BIM for Technician (2 days)
BIM for Modeler (Architecture) (3 days)
Specialised Autodesk Revit Structure/Architecture/MEP (5 days)
BIM for Modeler (Structure) (3 days)
BIM for Modeler (MEP) (3 days)
BIM for Coordinator (3 days)
BIM for Manager (2 days)

EXECUTIVE MASTER IN OCCUPATIONAL, SAFETY & HEALTH *(In collaboration with Universiti Teknologi Mara (UTM)*
EXECUTIVE DIPLOMA IN OCCUPATIONAL, SAFETY & HEALTH *(In collaboration with Universiti Teknologi Mara (UTM)*
SPECIALISED IN PROJECT MANAGEMENT
SPECIALISED IN OCCUPATIONAL, SAFETY AND HEALTH
SPECIALISED IN AIRPORT PLANNING & DESIGN
CEP - DUTYHOLDER'S OBLIGATIONS UNDER THE OSH LEGISLATION COSTS AND EFFECTS OF WORKPLACE ACCIDENTS
CEP - HIRARC (ADVANCED) (THE HOW)
CEP - SCAFFOLDING
CEP - WORKING AT HEIGHT
CEP - CRANE OPERATION
CEP - FORMWORK & FALSEWORK

For registration please log on to www.kliacollege.edu.my
Further info, please call:
Lela/Fakri at 603-8783 1002/1006
Email: lela@kliacs.com.my / fakri@kliacs.com.my
Course will be conducted at KLIA Professional & Management College

New Low Cost Carrier Terminal (LCCT), Sepang, Selangor.

Refinery and Petrochemicals Integrated Development (RAPID), Pengerang, Johor

Data Logger in the cabin of PVD installation rig.

Partners to the Best with Emas Kiara

Having established its reputation as an integrated provider of a complete range of geosynthetic products and geotechnical solutions, Emas Kiara had been entrusted to undertake the supply and installation of Prefabricated Vertical Drains (PVD) for fast paced, challenging and mega quantity projects. Together with our valued clients we have won accolades for best in safety, productivity and most importantly, completion time.

We also possess a comprehensive fleet of equipment, which include Hydraulic Rigs capable of penetrating depths up to 50m, mounted on Excavators and Crawler Cranes and Static Rigs which are all customized to suit various ground conditions.

Coupled with state of the art data loggers, capable of providing real-time data for recording and monitoring installations, we remain at the forefront of PVD technology.

Independent Deepwater Petroleum Terminal, Pengerang, Johor

EMAS KIARA MARKETING SDN BHD (226612W)

Lot 13A, Jalan RP3, Rawang Industrial Estate,
48000 Rawang, Selangor, Malaysia.
Tel : 603 - 6092 9898, 6092 6881 Fax : 603 - 6092 6602
Email : marketing@emaskiara.com

www.emaskiara.com

of managing the environment was considered an urgent issue. The ISO was pressured to produce a management system standard. There were objections to ISO writing this standard because it was not considered to be within the expertise and scope of ISO. It also intrudes on the role of the government who has responsibility and provides legislations on such matters. Other institutions are also experts in these matters. The same issue was raised again when ISO attempted to write an *Occupational Health and Safety Management System* standards and when it considered the writing of ISO 26000 Social Responsibility standard. Objections like these are the reason why until today (2014) no occupational health and safety management system standard was ever published by ISO although it attempted to do so in 1996. In these two cases the main opponent to ISO is the *International Labour Organisation (ILO)* which considers these subjects are within its domain.

ISO countered the argument by stating its advantage of being organization that reaches the entire world and building its standards through collaboration and consensus of experts. ISO in actual is an organiser of expertise and considers that whatever its doing is for the market needs. ILO eventually capitulated by signing on separate occasions a Memorandum of Understanding for cooperation to jointly develop the above two standards. ■

REFERENCES

[1] American National Standards Institute. "Through History with Standards". http://www.ansi.org/consumer_affairs/history_standards.aspx?menuid=5. July 10, 2014

[2] "On the Beauty Standards in Ancient China". http://history.cultural-china.com/en /183History4382.html. July 10, 2014

[3] British Standards Institution. "About BSI – Our history". http://www.bsigroup.com/en-GB/about-bsi/our-history/. July 10, 2014

[4] International Organization for Standardization. "About International Organization for Standardization". http://www.iso.org/iso/home/about.htm. July 10, 2014

[5] International Organization for Standardization. "Management system standards". http://www.iso.org/iso/home/standards/management-standards.htm. July 10, 2014

[6] Wikipedia, the free encyclopedia. "PDCA". http://en.wikipedia.org/wiki/PDCA. July 10, 2014

Ir. Hussein Rahmat is past chairman of the Environmental Technical Division, IEM. Currently he is theDirector of Environmental Resources Management Malaysia and a panel of trainers and examiners for Safety and Health Officer Certificate with the National Institute of Occupational Safety and Health (NIOSH). Ir. Hussein has been involved in standards writing activities since the early 1990s through his membership in several ISO National Mirror Committees at SIRIM. He has led the Malaysian delegation to ISO Technical Committee (TC) meetings, first when ISO 14001 environmental management system was approved by the TC in Oslo in 1995 and recently to the first meeting of the ISO Project Committee (PC283) on Occupational Health and Safety (ISO 45001) in London in 2013. Over the years he has attended many other ISO TC meetings on all the five continents. He was in the committee that drafted all the three revisions of MS1722 Occupational Safety and Health Management System standard.

IEM DIARY OF EVENTS

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.

Talk on Drilling Engineering - What Is It?

13 Sep 2014

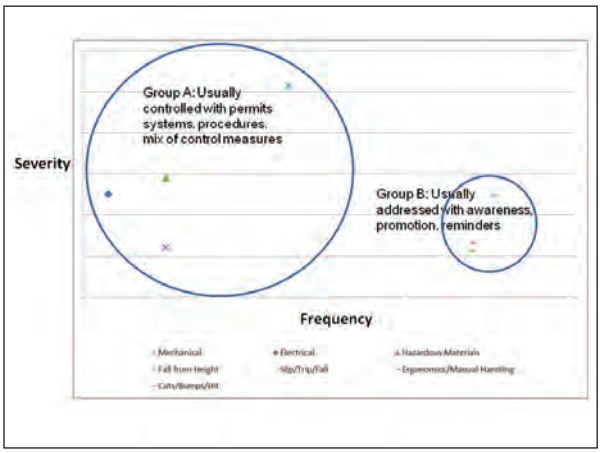
Time : 9.00 a.m. – 11.00 a.m.
Venue : Wisma IEM (02- C&S Lecture Room, Second Floor,03- TUS Lecture Room, Second Floor)
CPD/PDP: : 2

SAFE TEA TIME

Addressing High Impact

by Ir. Shum Keng Yan

I suppose you have your graph ready by now. Let's have a look again.



Group A incidents are typically controlled via permit systems, strict procedures, vigorous training and engineering out the hazard using different layers of control measures with a dash of behavioural safety.

Group B incidents, on the other hand, links up to attention and keeping a safety mind all the time. You tend to see awareness, promotion, posters, toolbox talks, pre-start checks and a heavy dose of behavioural safety, team safety, etc. as a way to reduce these incidents.

Even as we look at the graph, you will notice that severity in Group B is not totally equivalent to the severity in Group A. Group B tends to be Chronic due to long medical leave or recovery period. Group A is usually Acute.

Thus as management frets on the frequency rate (largely due to Group B), perhaps more attention should be paid to Group A. There are early warning signs and can appear as unsafe conditions or short cuts in carrying out critical procedures. They tend to be picked up during audits, site inspections or even casually over a cup of tea at the cafeteria. Usually nothing serious occurs and then all of a sudden something major just "happen". I do not believe it was sudden. There are usually pre-cursors that might have been missed out.

Contrast this to Group B. They occur more frequently and this riles up the management as the "numbers" do not look good. There is often a knee jerk reaction to "have a campaign" or do something about it. These cases are usually due to a sudden lapse of attention. It could be that the person thinks that the activity is not so risky.

How then can we better address both of them?

Let's look further down the root. I believe we have all implemented management commitment and involvement, line management and employee responsibilities, unsafe behaviours and so on. Then there is the positive reinforcement approach. Pretty traditional and time tested methods. The improvement is usually marginal.

How can we better improve on the control measures? Send your ideas to: pub@iem.org.my

How can we better improve on the control measures? Send your ideas to: **pub@iem.org.my**. ■

The safest risk is the one that you did not take. Often it is the gap in the risk perception that leads to a gap in risk control.

Ir. Shum Keng Yan is a chemical engineer and a certified accident prevention and safety practitioner. He advises on EHS in the chemical, fast moving consumer goods, heavy metal manufacturing and building services industries across Asia Pacific and beyond. He regularly delivers talks at conferences, forums and universities.

IEM DIARY OF EVENTS

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.

IEM Engineer's Run 2014

14 September 2014 (Sunday)

Time : 7.30 a.m.

Venue : Persiaran Barat, Petaling Jaya (in front of Amcorp Mall)

One-Day Seminar on "Climate Change, Engineer's Role and Challenges"

by Ir. Tang Boon Heng

ENVIRONMENTAL ENGINEERING TECHNICAL DIVISION (ENETD)

THE Environmental Engineering Technical Division (EETD) successfully organized a one-day seminar, *"Climate Change, Engineer's Role and Challenges"* on 26 June 2014 to enhance engineers' awareness on issues, causes and impact of climate change to the earth and to discuss ways to adapt, minimize or mitigate the impact of the problem. Six distinguished speakers from various organizations with different background and experiences presented their papers.

Following the opening and welcome speech by the EETD chairman, Dr Gary W. Theseira from the Ministry of Natural Resources and Environment presented *"Overview and Issues On Climate Change, Malaysia's contribution, Policies and Planning in Mitigating The Problem"*. Malaysia's national policy on climate change was presented with frameworks of adaptation and mitigation. Combating climate change is a global issue which requires all nations to work together, assist each other in terms of technology and financing for the successful implementation of the agreed strategies and policies.

The second speaker, Dr Abdul Rahim Bin Ahmad, Head of Energy & Sustainable Development of UNITEN spoke on *"Industries and Greenhouses Gases Mitigations: How Can We Play a Role"*. GHG emission, its impact and emission reduction efforts were well discussed. Energy Efficiency (EE) & Conservation is identified as an important way forward to reduce emission and enhance the development of sustainable energy policy.

Ir. Dr YauYat Huang, currently attached to Universiti Malaya and INTI International University, presented the *"Indoor Air Quality and climate change – Engineer's Role and Challenges"*. His presentation dealt with the relationship between indoor air quality and climate change. Due to climate change, the air quality design parameters adopted has to be modified accordingly and innovative ventilation system to be incorporated to mitigate its impact.

"Overview on Oil & Gas Sector's Risk Management Strategy and Adaption Towards Climate Change Related Risks" by Engr. Chew Teck Wee of Envirosolutions & Consulting is the fourth presentation. He discussed the risk management and adaptation strategy in the oil and gas industry which is one of the contributors to GHG emission. A new technique, Carbon Capture & Storage (CCS) is currently being developed but it is an expensive solution. Engineers can contribute by promoting Energy Efficiency, and reducing carbon footprint on projects via innovative design, develop effective assessment and monitoring technique and build-in adaptation action plans.

Engr. Krishna MoorthyPalanisamy presented *"Climate Change & Palm Oil Industry, Engineer's Role and Challenges"*. Palm oil industry has been associated with high emission of greenhouse gases which intensifies the climate change problems. Implementation of resource efficiency operation at palm oil mills can provide opportunity to mitigate or minimize the problem, consequently promoting green growth of the industry. The abundant biomass by-products of the industry also provide opportunity for the generation of clean energy to offset carbon emissions. Innovative re-design of oil extraction process is currently available to minimize energy usage and achieve better energy efficiency and subsequently lower the operation cost, reduce emissions and provide better profitability (**www.rank.com.my/ energywise**).

The final speaker, Robert CY Cheong presented *"Carbon Related Issues: How It Can Affect the World Climate Change & Solutions to Mitigate the Problem"*. The Kyoto Protocol called for reductions in emissions of six GHC types. Identification of emission sources and types of emission are essential to assist in development of techniques and methods to measure and control GHG. Various techniques such as *Clean Development Mechanism (CDM), Joint Implementation (JI), Verified Emission Reductions (VER)*, and *Carbon Neutrality* are commonly adopted to assess and mitigate the problem. Established standards and guidelines including ISO 14064 *Series Part 1 to 3, GHG Protocol, PAS 2050, MY Carbon, Gold Standard* are being implemented to enhance control measures.

The seminar ended after the Question and Answer session and the presentation of Mementoes and Certificates of Appreciation to the speakers. ■

Ir. Tang Boon Heng, Environmental Engineering Technical Division (ENETD) is a committee member, BE (Hons) MIEM, PEng

IEM DIARY OF EVENTS

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.

Talk on An Introduction to A Pneumatic Conveying System, Its Advantages and Practical Selection Guidelines

6 Sep 2014

Time : 9.00 a.m. – 11.00 a.m.
Venue : Wisma IEM (02-C&S Lecture Room, Second Floor, 03-TUS Lecture Room, Second Floor)
CPD/PDP: : 2

Talk on Development Challenges in Singapore MRT Project

GEOTECHNICAL ENGINEERING TECHNICAL DIVISION

by Ir. Liew Shaw Shong

A technical lecture was delivered by Dr Ng Tiong Guan, President of Geotechnical Society of Singapore (GEOSS) at Seminar Room of Royal Institution of Surveyor Malaysia on 18th April 2014. It was chaired by Ir. Liew Shaw Shong, Chairman of Geotechnical Engineering Technical Division (GETD) and attended by 64 participants.

Dr Ng started the lecture with sharing the background history of Mass Rapid Transport (MRT) construction projects in Singapore in early 1980's. The first line, namely the North South Line, followed by East West Line, North East Line, Circle Line and Down Town Line Stage 1 have occupied the construction industry of Singapore in the past 30 years. Few more lines are under construction or in the detail design stage now. To date Singapore has over 160 km operational rail lines and over 80 MRT stations. The Land Transport Authority (LTA) of Singapore plans to expand the current networks to 360 km in 2030.

The challenges encountered in the heavily populated metropolitan city, like Singapore, can be briefly summarised as follows:

a) Ground variability likes soft surficial deposits, variable bedrock profiles and formations.
b) Challenges of mixed faces tunnelling works.
c) Underground excavation and tunnelling at close proximity to existing properties.
d) Impact of treatment works stabilising the excavation works, likes grouting induced ground movements and/or the operation works itself, like installation of diaphragm wall, etc which are not able to be estimated by the finite element analysis.
e) Unforeseen underground obstructions (mostly undocumented man-made objects left in the ground).
f) Construction controls and mitigation measures for tunnelling at very narrow margin to existing operational tunnels.
g) Integration of old MRT station with new station or expansions.
h) Groundwater problems, likes seepage and water bearing formation of high permeability.

In the last part of his presentation, Dr Ng shared with the audience a case study involving serious ingress seepage problem (maximum seepage rate of 800 liters/minute) at the corner of the excavation, which might be contributed by mixture of probable causations, likes the existence of highly permeable bearing layer, namely F1 fluvial sand layers, unforeseen weak joints, possible of inadequate water stop provision at diaphragm wall panels below the excavation depth that do not extend beyond the F1 fluvial sand layer due to constructability issue and differential deflection of diaphragm wall panels due to corner effect. He then also presented the monitoring results of the affected excavation wall, showing the connectivity of the piezometric responses in the F1 fluvial deposit in relation to the drawdown due to the leakage to the excavation. Besides, the influence zone subjected to construction disturbance could be much wider if it involves groundwater drawdown effect in the water bearing stratum.

During the very interactive discussion session, there were many interesting questions about the removal of ground anchor strands for tunnelling works, protection of instruments within the excavation, advantages of three tips vibrating wired piezometer as compared to pneumatic piezometer, computational time for a three dimensional finite element analysis, the party to bear the cost of remedy, cost for the instrumentation per MRT station and others.

The talk ended with a presentation of memento by a senior member of GETD, Ir. Dr Ooi Teck Aun, to Dr Ng Tiong Guan.■

Photo 1 : Presentation of memento by Ir. Dr Ooi Teck Aun to Dr Ng Tiong Guan

Ir. Liew Shaw Shong is currently the advisor of IEM Geotechnical Engineering Technical Division (GETD). He is the Senior Director of G&P Geotechnics Sdn. Bhd.

IEM DIARY OF EVENTS

Kindly note that the scheduled events below are subject to change. Please visit the IEM website at www.myiem.org.my for more information on the upcoming events.

Visit to Havys Biogas Plant in Palong, Negeri Sembilan

6 Sep 2014

Time : 8.30 a.m. – 5.30 p.m.
Venue : Havys Oil Mill Sdn. Bhd., KM32, Bahau-Keratong Highway, Bera Pahang, 72100 Bahau, Negeri Sembilan.
CPD/PDP: : 2

Technical Visit to Boustead Naval Shipyard and Royal Malaysian Navy Naval Base, Lumut, Perak

by Shazlan Rahman CEng MICE

MARINE & NAVAL ARCHITECTURE TECHNICAL DIVISION

THE Marine Engineering and Naval Architecture Technical Division (MNATD) organized a two-day technical visit to the **Boustead Naval Shipyard (BNS)** and **The Royal Malaysian Navy (RMN) Naval Base** in Lumut, Perak on 11 and 12 April 2014. The group comprised of 20 members and engineers in the related fields.

On the first day of visit to BNS, one of the major shipyard in the country, the group was briefed by Tuan Haji Nasiruddin Mat Som on the history of the organization, its operation and current projects including the service life extension program, maintenance and repair overhaul, emergency repair and fabrication of offshore structure. His presentation followed by a question-answer session ranging from technical queries to the career development of young engineers. The visitors were later given a tour around the shipyard facilities by Mr. Nor Rahim Kadir. They visited the floating pier, which is able to stay afloat as the sea level going up and down due to the tide cycles, a ship lift platform which can lift up a vessel of up to 3,800 tonnes; and a large workshop, where hull-outfitting works are carried out.

On the second day, the group visited the Naval Base RMN where they were given a tour aboard of the KD RAJAWALI, the KD SELANGOR and the KD PELANDOK navy ships. The KD RAJAWALI housed the air-wing of the RMN including a heli-pad. Leading Rate Noah and Leading Rate Azam gave a briefing on the two of the RMN's helicopters – Super Lynx and Fennec – their operational capabilities and roles.

The group later visited the KD SELANGOR, one of the RMN's newest Offshore Patrol Vessels (OPV), which has seen tour of duty in Daulat Ops in 2013 and recently in the search and rescue operation of the missing MH 370. Sub-Lieutenant Kulwant Singh briefed on the technical details of the ship, its operations, technical and roles of marine engineers in keeping the ship in excellent operational conditions. The group then proceeded to the *Galeri Panglima Tentera Laut* of KD PELANDOK, an exhibition of the past and present admirals (Chief of Navy) and history of RMN. The visitors were very appreciative of what RMN and their admirals have done to protect the security of our country.

The technical visit to both organizations were certainly informative and interesting and the visitors now have a better understanding and informed of the maritime industry in Malaysia. ■

Engr. Shazlan Rahman is a corporate member with the Institution of Civil Engineers UK (MICE) and a chartered engineer with Engineering Council UK (CEng). He has experience in the structural design and integrity management of offshore structures. He is a committee member of the IEM Marine and Naval Architecture Technical Division.

Figure 1: Group photo of IEM visitors and BNS staff

Figure 2: Group photo with Sub-Lieutenant Kulwant Singh on board of KD SELANGOR

The 41st Annual General Meeting of the Institution of Engineers, Malaysia (Southern Branch)

by Ir. Mohd. Khir Muhammad
Southern Branch

THIS year's Annual General Meeting (AGM) of The Institution of Engineers Malaysia, (Southern Branch) has seen Ir. Assoc. Prof. Hayati bt Abdullah made history in IEM when she became the first lady engineer to be elected as the chairman of an IEM branch.

Ir. Hayati, currently an associate professor of mechanical engineering at Universiti Teknologi Malaysia (UTM), Skudai has been actively serving the southern branch committee as well as the Women Engineers section in recent years.

She took over the helm of the southern branch for the Session 2014/2015 during the 41st AGM on 21 June 2014 at a hotel in Johor Bahru from Ir. David Lee Hock Hai who has effectively served for the last two sessions.

The AGM was well attended by a total of 159 members comprising of 18 fellows, 117 corporate members, and 24 graduates including past chairmen and those members working and residing in Singapore.

Prior to the AGM, the branch arranged for a technical talk on "Steel Fiber Reinforced Concrete" which was presented by Ing. Hendrik Thooft from Bakaert Southern Wire Sdn. Bhd. From Bakaert Southern Wire Sdn Bhd. it was attended by 88 members.

This year's AGM is also a homecoming for IEM President Dato' Ir. Lim Chow Hock. The southern branch is certainly very proud to see Dato' Ir. Lim,who is its past chairman, to be elected as IEM president.

Overall, the AGM was successfully conducted and following the meeting, members enjoyed the buffet lunch, compliments of the Southern Branch. As in every year, the branch's AGM (as well as the annual dinner) is not only seen as a formal conduct of meeting among members but it is also an occasion for them to get together, meeting friends and colleagues. ■

EXECUTIVE COMMITTEE, IEM SOUTHERN BRANCH SESSION 2014/2015

Chairman
Ir. Assoc. Prof. Hayati binti Abdullah

Vice Chairman
Ir. Lee Meng Chiat
Ir. Hj. Zainuddin bin Md. Ghazali

Hon. Secretary
Ir. Derek Cheah Kong Yew

Hon. Treasurer
Ir. Wong Yee Foong

Committee Members
Ir. Kamisan bin Turiman
Ir. Lai Woon Fatt
Ir. Assoc. Prof. Dr Sharul Kamal bin Abd. Rahim
Ir. Khairul Annuar bin Sulaiman
Ir. Dr Goh Hui Hwang (co-opted)

Immediate Past Chairman
Ir. David Lee Hoke Hai

Past Chairman Serving In The Committee
Dato' Ir. Steve Chong Yoon On
Dato' Ir. Ng Ah Kow
Ir. Teh Sea Chuan
Ir. Chan Choong Cheong
Ir. Sim Tian Liang
Ir. Hj. Mohd. Khir bin Muhammad

Photo 1: *Chairman and Executive Commitee of Southern Branch with IEM President*

Photo 2: *The AGM in session*

Photo 3: *IEM President (sitting right) with past chairmen of Southern Branch*

Photo 4: *Members attending the AGM*

Photo 5: *Members attending the AGM*

Photo 6: *Members attending the AGM*

Photo 7: *Registration*

Photo 8: *Members taking opportunity to meet freinds and colleagues*

Photo 9: *The incoming chairman, Ir. Hayati Abdullah (left) and the outgoing chairman, Ir. David Lee Hoke Hai*

Photo 10: *The newly elected chairman of Southern Branch, Ir. Assoc Prof. Hayati Abdullah*

Ir. Mohd. Khir is the past chairman of IEM Southern Branch.

Protection Technologies
Injection Systems

Whether for restoring structural integrity or for sealing cracks and surfaces against the ingress of water, MC-Bauchemie – the leading supplier and expert in this area – offers proven Injection Systems to suit your project requirements.

- Waterproofing of Structures
- Strengthening of Structures
- Sealing against Water Ingress
- Foundation Stabilisation

MC

Your Partner in Construction for:
- Injections and Sealing Systems
- Concrete Repair & Surface Protection
- Industrial Flooring Systems
- Waterproofing Systems
- Architectural Mortars
- Tile Adhesives and Grouts
- High Performance Concrete Admixtures

MC Bauchemie (M) SDN BHD
Lot S113 • 2nd Floor • Centrepoint
No.3 Lebuh Bandar Utama • Bandar Utama
47800 Petaling Jaya • Selangor • Malaysia
Tel: 03 - 7728 1233 • Fax: 03 - 7728 6833
enquiry@mc-bauchemie.com.my • www.mc-bauchemie.com

The 2nd IEM Chemical Engineering Design Competition 2013/2014

by Engr. Dr Chong Chien Hwa

CHEMICAL ENGINEERING TECHNICAL DIVISION

THE chemical engineering design project, known as the Capstone Project, is one of the most important module or subject for an accredited Chemical Engineering degree programme. It involves the utilisation and integration of learning outcomes gained throughout the entire undergraduate course. To enhance the design competency for undergraduate students in Malaysia, the Chemical Engineering Technical Division (CETD) has organised the IEM Chemical Engineering Design Competition 2013/2014 on 26 April 2014.

This 2nd design competition with the theme 'Design of a Palm-based Biomass Plant – Production and Utilisation' was sponsored by Invensys, a process simulation company. Deliverables of the competition covered feasibility report, process flow diagram and equipment selection, mass and energy balances, demonstration of sustainability concept, equipment design, process and instrumentation diagram, basis, criteria and limits of design and economic performance.

The competition attracted 18 teams from public and private institutions in Malaysia and after evaluation of progress reports, the following teams were shortlisted for the final presentation at Armada Hotel Petaling Jaya on 26 April 2014: Monash University (Sunway Campus), University of Nottingham (Malaysia Campus), Universiti Kebangsaan Malaysia, University Malaysia Pahang, and Universiti Tunku Abdul Rahman (Kampar campus).

Oral and poster presentations were held during the final presentation, with judges consisting of academics and industrial practitioners. Judges for the competition were appointed from among academics and industry practitioners. Some insightful questions posed to the students regarding the life span of catalyst, plant feasibility, design requirement for certain process, have indeed enlightened the participants. The final results of the competition are summarized as in Table 1.

Table 1: The final results of the competition

AWARDS	UNIVERSITY	NAME OF PARTICIPANT
Champion	Monash University (Sunway Campus)	Lee Leong Hwee, Jenny Yap Wee Li, Nisha Thavamoney, Lydia Yap Li-Ya, Fatimah Azizah Riyadi
First Runner Up	Monash University (Sunway Campus)	Loow Yu-Loong, Tommy Chandra, Muhammad Adib Norshariffudin, Nicholas Wongso, Tan Hock Tai
Second Runner Up	Universiti Tunku Abdul Rahman Universiti Malaysia Pahang (co-winner)	Chan Jiun Haur, Fan Kar Hoe, Ooi San Nee Liew Shi Yan, Jesslyn Tan Kim Ean, Tay Hong Luan, Loo Mei Soon, Chong Hon Yvain

At the end of the final presentation, CETD chairman Prof Ir. Dr Dominic Foo Chwan Yee presented a souvenir to Mr. Hans Tan, representative sponsor's company. The competition chairman, Engr. Dr Chong also presented certificate of appreciation to all judges. ■

Photo 1: *Judges and organizing committee members of 2nd IEM Design Competition*
Photo 2: *The winning teams, judges and the shortlisted team supervisors*

Dr Chong Chien Hwa is a committee member of CETD and currently is the Associate Dean (Learning & Quality), School of Engineering, Taylor's University. He a Chartered Engineer with the UK, Member of the Institution of Chemical Engineers (MIChemE) and the Institution of Engineering and Technology (MIET). He is also the chairman for the IEM Chemical Engineering Design Competition 2013/2014.

Orang Asli on Campus Exploration: A Welfare Initiative Programme of Women Engineers Section


by Engr. Dr Habibah@ Norehan Hj. Haron
Engr. Assoc. Prof. Dr Leong WaiYie

WOMEN ENGINEERS SECTION

IEM-WE (WOMEN ENGINEERS SECTION) organized educational visits for *Orang Asli* school children from Kuang, Selangorto two universities on 30 May 2014. The objectives were: encourages the learning of math and science as the basis of engineering as career; attracts students to pursue the study and career in engineering and exposure to the university learning environment and various engineering opportunities.

The Orang Asli children arrived at Universiti Teknologi Malaysia (UTM), Kuala Lumpur campus at 9.30am. They were welcomed by UTM Razak School of Professional Quality (Pro-Q) committee members, followed by a motivational talk which included a 'brain game' and later the tour of laboratories including the Robotics and Formula 1 labs.

The group was later divided into three groups for a creativity competition. They were given the task to design and make a model car from recycled materials within 20 minutes. Each group produced a model car to meet the given criteria including operational and aesthetic values. Prizes were given to the fastest car category, most creative and most economical in terms of least waste material during the production process. All of them responded positively to the survey questions about the programmed organized by IEM-WE and UTM. It had motivated them to wanting to pursue the study in science and engineering in the future.

By 2.00p.m. the group left for the second leg of the program at Taylor's University Lakeside Campus. The 10 Orang Asli students and the two group leaders were impressed by the facilities, halls of residence, support services, cafés and labs in the campus.

"The contemporary campus is amazingly beautiful. We wish to join university life and enjoy a special sense of community. With its green open spaces, lake, trees and wildlife it is an exceptional environment in which to study, live and relax." – Comments by the youths.

Just a short walk to the engineering workshop, they were extremely excited about the various research projects including the Taylor's Racing Car, which drew great interest from the group.

"We really wish to use the state of the art equipment and software available at the labs to ensure that we can build a car that is not only light and fuel efficient, but also safe and comfortable".

"I think that the best way to succeed in school and achieve my goal is to study, study and even study some more," said one of the youths.

After the Campus Exploration Programme, the Orang Asli students were fully motivated to further their studies at the university level. This IEM–WE welfare initiative has no doubt provided a platform to nurture the youth's interest to study engineering.

(IEM-WE would like to acknowledge support of the two universities in making this welfare programme a success). ■

Photo 1-2: *Ice-breaking and motivation session at UTM Kuala Lumpur*

Photo 3 & 4: *Design and make project – creativity at UTM Kuala Lumpur*

Photo 5 & 6: *UTM Engineering labs and F1 WIP*

Photo 7 & 8: *Luncheon at UTM KL Campus and Farewell*

Photo 11: *Impressed with the contemporary campus*

Photo 10: *Asli with the Taylor's Racing Car*

Engr. Dr Habibah@ NorehanHj.Haron is a lecturer at UniversitiTeknologi Malaysia, is currently acommittee member of Women Engineers Section and involved in in engineering education research and manufacturing systems engineering.
Engr. Assoc. Prof. Dr Leong Wai Yie currently a lecturer at Taylor's University, is currently a committee member of Women Engineers Section and involved in biomedical signal processing analysis and wireless communications.

Tarikh: 14 Julai 2014

To All Members,

SENARAI CALON-CALON YANG LAYAK MENDUDUKI TEMUDUGA PROFESIONAL TAHUN 2014

Berikut adalah senarai calon yang layak untuk menduduki Temuduga Profesional bagi tahun 2014.

Mengikut Undang-Undang Kecil IEM, Seksyen 3.9, nama-nama seperti tersenarai berikut diterbitkan sebagai calon-calon yang layak untuk menjadi Ahli Institusi, dengan syarat bahawa mereka lulus Temuduga Profesional tahun 2014.

Sekiranya terdapat Ahli Korporat yang mempunyai bantahan terhadap mana-mana calon yang didapati tidak sesuai untuk menduduki Temuduga Profesional, surat bantahan boleh dikemukakan kepada Setiausaha Kehormat, IEM. Surat bantahan hendaklah dikemukakan sebulan dari tarikh penerbitan dikeluarkan.

Ir. Gunasagaran Kristnan
Setiausaha Kehormat, IEM,

PERMOHONAN BARU

Nama	Kelayakan
KEJURUTERAAN KIMIA	
AW SEI HOWE	BE HONS (UTM) (CHEMICAL, 2010)
FATIHAH BINTI SUJA'	BSc (CLARKSON) (1991) MSc (UKM) (CHEMICAL & PROCESS, 1997) PhD (NEWCASTLE UPON TYNE) (2005)
KEJURUTERAAN AWAM	
ABHIRAM PRATIBHAYANAND GOPINATH	BE (MYSORE) (CIVIL, 1977) MSc (INDIAN INST. OF TECH MADRAS) (CIVIL, 1979) MBA (BANGALORE) (MARKETING MANAGEMENT, 1988) PhD (INDIAN INST. OF TECH MADRAS) (1982)
ALI BIN MOHAMAD YUSOF	BE HONS (UiTM) (CIVIL, 2008)
CHANG CHAO KIAT	BE HONS (ADELAIDE) (CIVIL & STRUCTURAL, 2005) ME (ADELAIDE) (CIVIL, 2005)
CHUNG CHOON KEE	BE HONS (UNITEN) (CIVIL, 2007)
KEJURUTERAAN ELEKTRIKAL	
MUHAMAD HAD BIN KADIR	BE HONS (UiTM) (ELECTRICAL, 2007)
WONG HANG WEE	BE HONS (MULTIMEDIA) (ELECTRICAL, 2006)
KEJURUTERAAN MEKANIKAL	
ABANG ASHAARI BIN ABDUL RAHMAN	BE HONS (UTP) (MECHANICAL, 2005)
AHMAD BAHARUDDIN ABDULLAH	BE HONS (USM) (MECHANICAL, 1999) MSc (USM) (MECHANICAL, 2002) PhD (UPM) (2013)
KHAIRUL AZRI BIN ISHAK	ME HONS (LIVERPOOL) (MECHANICAL, 2009)
MOHAMMAD FUAD BIN ABDULLAH	BSc (TEXAS) (MECHANICAL, 1990)
NG WEE MENG	BE HONS (UNIMAS) (MECHANICAL & MANUFACTURING SYSTEMS, 2003)
ZAHRIN BIN NADZIMUDDIN	ME HONS (MANCHESTER) (MECHANICAL, 2006)
KEJURUTERAAN TELEKOMUNIKASI	
ROSDISHAM BIN ENDUT	BE HONS (UM) (TELECOMMUNICATIONS, 2000) MSc (UPM) (COMMUNICATION & NETWORK SYSTEM, 2004)

PERPINDAHAN AHLI

No. Ahli	Nama	Kelayakan
KEJURUTERAAN AEROANGKASA		
33902	KAMARUL ARIFIN BIN AHMAD	BE HONS (USM) (AEROSPACE, 2001) MSc (CRANFIELD) (AERODYNAMICS, 2003) PhD (BELFAST) (2006)
61935	NORILMI AMILIA BT ISMAIL	BE HONS (USM) (AEROSPACE, 2004)
KEJURUTERAAN KIMIA		
54232	ZURAIMI BIN ALIAS	BE HONS (UiTM) (CHEMICAL, 2008)
KEJURUTERAAN AWAM		
62055	LAW SOON GUAN	BE HONS (SALFORD) (CIVIL, 2004)
36647	LEE KOK SUN	BE (SWINBURNE) (CIVIL, 2004)
37228	MOHD AZYZUL BIN YAHAYA	BE HONS (UiTM) (CIVIL, 2001)
19596	RAJA EZRIN SHAFRIZAN BIN RAJA SAFIAN	BE HONS (UiTM) (CIVIL, 2001)
23160	SASITHARAN S/O RAMAKISHAN	BE HONS (UTM) (CIVIL, 2002)
52404	TAN CHONG HOO	BE HONS (USM) (CIVIL, 2004) MSc (USM) (STRUCTURAL, 2005)
23233	WONG SEE POH	BE HONS (HERTFORDSHIRE) (CIVIL, 1998)
61897	YONG KUOK SOON	BE HONS (UNIMAS) (CIVIL, 2004)
KEJURUTERAAN ELEKTRIKAL		
51302	LIEW ZHAN LIU	BE HONS (UNITEN) (ELECTRICAL & ELECTRONIC, 2006)
70631	MOHD HELMI BIN ABDUL RAHMAN	BE HONS (UM) (ELECTRICAL, 2005)
34844	MOHD JUFRI BIN ISMAIL	BE HONS (UTM) (ELECTRICAL, 2007)
66410	NG JOO YOONG	POST GRAD (EC) (ELECTRICAL, 2011)
51273	RAJA SAHARUDDIN BIN RAJA DAUD	BE HONS (UTP) (ELECTRICAL & ELECTRONICS, 2007)
46862	SHAMSUDIN BIN MOHD FUAD	BE HONS (UM) (ELECTRICAL, 2010)
61188	YUSRIZAL BIN MOHD YUSOF	BE HONS (UiTM) (ELECTRICAL, 2004)
KEJURUTERAAN ELEKTRONIK		
70459	FATIMAH BINTI MD HASAN	BE HONS (UNIMAS) (ELECTRONICS & TELECOMMUNICATIONS, 2006)
25647	HARIKRISHNAN RAMIAH	BE HONS (USM) (ELECTRICAL & ELECTRONIC, 2000) MSc (USM) (ELECTRICAL & ELECTRONIC, 2003) PhD (USM) (2009)
KEJURUTERAAN LEBUHRAYA		
16042	POK SUM LONG	BE HONS (UTM) (CIVIL, 1994) MSc (UPM) (HIGHWAY & TRANSPORT, 2001)
16207	S. PANNEERCHELVAM A/L S. SEVUGAPPERUMAL	BE HONS (MANGLORE) (CIVIL, 1995) ME (UPM) (HIGHWAY & TRANSPORT, 2006)
KEJURUTERAAN KAWALAN & INSTRUMENTASI		
53714	NORHALIZA ABDUL WAHAB	BE HONS (UTM) (INSTRUMENTATION & CONTROL, 1999) ME (UTM) (ELECTRICAL, 2001) PhD (STRATHCLYDE) (2009)
55846	THANNEERMALAI S/O R.MEENAKSHI SUNDARAM	BE HONS (UCSI) (MECHATRONIC, 2010)
KEJURUTERAAN PEMBUATAN		
61939	CHIN JENG FENG	BE HONS (BIRMINGHAM) (MANUFACTURING, 2000) PhD (BIRMINGHAM) (MANUFACTURING & MECHANICAL, 2006)
KEJURUTERAAN MEKANIKAL		
32805	AHMAD ZAMANI MASNIZAM BIN ABDULLAH ZAWAWI	BE HONS (UTP) (MECHANICAL, 2008)
47603	KHAIRUL FAIZI BIN MOHAMED	BE HONS (UNITEN) (MECHANICAL, 2009)
43794	MAHESVARAN A/L PAMUSAMY	BE HONS (UTM) (MECHANICAL-AERONAUTICS, 2006)
21537	MOHD FAIRUSHAM GHAZALI	BE HONS UiTM) (MECHANICAL, 2002) MSc (MANCHESTER) (2005) PhD (SHEFFIELD) (2012)
55835	MOHD FAIZAL BIN MALEK	BE HONS (UPM) (MECHANICAL SYSTEM, 2000)
28621	MOHD SHAFIQ SHARHAN BIN ZAINAL	BE HONS (UTM) (MECHANICAL, 2008)
64639	NAVIN A/L RAMASAMY	BE HONS (UTHM) (MECHANICAL, 2011) ME (UM) (2012)
53768	SHAHRUL AZHAR BIN MUSTAFFA	BE HONS (UKM) (MECHANICAL, 2008)
34360	SIA HUA JIUH	BE HONS (UTP) (MECHANICAL, 2007)
34845	VALENTINE AK GLAYAN	BSc (CALIFORNIA) (MECHANICAL, 2000)
KEJURUTERAAN TELEKOMUNIKASI		
50195	LIM MUN YEE, JOANNE	BE HONS (MONASH) (ELECTRICAL & COMPUTER SYSTEMS, 2009)
54528	MOHAMED NIZA BIN HANI	MESc (UM) (2012)
55873	RENGIAH A/L SINNATHAMBY	BE HONS (UMP) (ELECTRICAL SYSTEM, 2007)
		BE HONS (UTM) (ELECTRICAL, 2006) ME (UTM) (ELECTRICAL-ELECTRONIC & TELECOMMUNICATIONS, 2009)

Pengumuman yang ke-73

SENARAI PENDERMA KEPADA WISMA DANA BANGUNAN IEM

Institusi mengucapkan terima kasih kepada semua yang telah memberikan sumbangan kepada tabung Bangunan Wisma IEM. Ahli-ahli IEM dan pembaca yang ingin memberikan sumbangan boleh berbuat demikian dengan memuat turun borang di laman web IEM http://www.iem.org.my atau menghubungi secretariat di +603-7968 4001/5518 untuk maklum,at lanjut. Senarai penyumbang untuk bulan Ogos 2014 adalah seperti jadual di bawah:

NO.	NO. AHLI	NAMA
1	04961	ASOK KUMAR S/O HARILAL HIRA PATEL
2	06138	LIEW HIN LEONG
3	13339	MAZLAN BIN SHAMSUDDIN
4	65218	NG SEE EN, JEFFERY DANIEL

NO.	NO. AHLI	NAMA
5	01793	PROF. MOHAMAD AFIFI BIN ABDUL MUKTI
6	02680	QUAH EWE HOCK
7	15132	TAN CHEE SENG
8	08253	TAN CHUNG KEN
9	06172	TAN HOON KEONG

CALL FOR NOMINATIONS

IEM ENGINEERING HALL OF FAME AWARD 2015

The Sub-Committee of Engineering Hall of Fame under the auspices of the Standing Committee on Professional Practice is proud to invite nominations for the IEM Engineering Hall of Fame Award 2015.

It is timely and expedient to induct and to record the accomplishments of engineers in the country who have or had demonstrated particularly outstanding professional achievements and provided excellent services to the Institution, the engineering industry and the Nation.

The IEM Engineering Hall of Fame is established with the aim to confer recognition and to celebrate the accomplishments of members of the IEM:

- Who have demonstrated outstanding professional achievements.
- Who have made significant contributions to the engineering profession, the Institution of Engineers, Malaysia (IEM) and the Nation.
- Who have rendered valuable service to the Community.

The Engineering Hall of Fame will serve as the focal point or showcase of outstanding Malaysian engineers, past and present, who had or have made great contributions to the engineering profession and to the quality of life in Malaysia. Engineers honoured in the Engineering Hall of Fame will also serve as a beacon and as role models for young engineers as well as create greater interest in engineering in general and awareness of the contributions made by outstanding engineers in the country.

Nominations for the Award are open to Malaysian citizens who are or have been Corporate Members of the IEM.

The closing date for receipt of nominations for IEM Engineering Hall of Fame Award is **30 September 2014**.

The nomination form can be downloaded from the IEM website ***www.myiem.org.my***. For further details, kindly contact IEM Secretariat at **03-7968 4001/2**.

IEM AWARD FOR CONTRIBUTIONS TO THE ENGINEERING PROFESSION IN MALAYSIA 2015

To encourage an interest in engineering and to recognise important services or contributions to engineering in Malaysia, the IEM Award for Contribution to the Engineering Profession in Malaysia is to be presented to the person(s), who has:

- Contributed to the advancement of engineering in Malaysia, and/or
- Designed and constructed an original engineering device or system of merit and applicability to industry.

This Award is open to all Malaysian citizens and permanent residents.

NOMINATIONS

- Nominations will be invited annually. The closing date for receipt of nominations for each year is 30 September.
- Nominations shall be made through a member of the Institution. Each member is restricted to one nomination per year.
- Each nomination shall be accompanied by a brief write up of the services rendered or contributions made or system designed and/or constructed together with relevant photographs and other documents.

AWARD

- The Award is to be made by the Council upon recommendation by the Awards Committee.
- The Award shall comprose a metal plaque, a scroll and a sum of RM1,000.

The closing date for nominations is **30 September 2014**.

Hon. Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, Petaling Jaya, Selangor.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***

IEM OUTSTANDING ENGINEERING ACHIEVEMENT AWARD 2015

The IEM Outstanding Engineering Achievement Award is created to confer recognition to an organisation or body for outstanding engineering achievements within Malaysia. The award will be given to an organisation or body responsible for an outstanding engineering project in the country.

The basis for the award shall be an engineering achievement that demonstrates outstanding engineering skills which has made a significant contribution to the profession and to the quality of life in Malaysia. In making the selection, the following criteria will be given special consideration:

1. Contribution to the well-being of people and communities,
2. Resourcefulness in planning,
3. Creativity in the solution of design problems,
4. Pioneering use of materials and methods,
5. Innovations in planning, design and construction,
6. Unusual aspects and aesthetic values.

Engineering achievements which include, interalia, the following can be submitted for consideration:

- Bridges, Tunnels, Waterways Structures, Roads
- Telecommunications of national/ international character, Power Transmission and Transportation
- Dams and Power Stations
- Ports and Harbours
- Building and Structures
- Airports
- Water Supply, Waste Disposal Projects
- Military projects such as bases, launching units, harbour facilities
- Drainage, Irrigation and Flood Control Projects
- Local design and manufacture of high technology products
- Energy, Heat, Mass Transfer
- Outstanding work in engineering research and development
- Chemical processing of indigenous raw resources such as rubber, palm oil and various other local plants
- Innovative use of local engineering materials
- Outstanding contribution in engineering education
- Original discovery of useful engineering theory

Nominations are invited from all members of the Institution. Each nomination submitted should contain a brief summary/write-up of the project in approximately 1,000 to 2,000 words together with full relevant reports on the project and three copies of supporting documentation including photographs. A project or component part thereof which has received an earlier award, from IEM does not qualify for nomination.

The closing date for nominations is **30 September 2014**.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***

IEM YOUNG ENGINEER AWARD 2015

(On behalf of IEM, the YES-G&S Committee is proud to invite nominations for the YOUNG ENGINEER AWARD for year 2015)

The objective of the Award is to encourage interest in engineering and to recognise potential among young engineers in Malaysia. The Award will be presented to the person who has shown outstanding ability and leadership qualities, **either**

i. in the design and/or construction of an engineering device or system of merit; **or**

ii. in the research and development or teaching of engineering.

In any one year, the Award may be made in either one or both of the categories mentioned above. If the Award is to be made in only one of the two category may be made in the year. The Award is open to candidate who are:

i. Registered member with the Board of Engineers, Malaysia and under 35 years of age

ii. Malaysian citizens or permanent residents of Malaysia

iii. Graduate or Corporate Members of IEM.

Photocopies are allowed. The closing date for nominations is 30 September 2014.

The Proposer may or may not be a member of IEM. However, each nomination shall be supported by a brief recommendation from two Referees who are Corporate members of IEM. If the Proposer himself is a Corporate member of IEM (or higher), then he may also act as one of the two required Referees.

Future nomination will be invited bi-annually.

The Award will comprise a cash prize of RM500.00, a scroll and plaque, to be presented with due ceremony to each recipient of the Award.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***.

IEM WOMAN ENGINEER AWARD 2015

The Women Engineer's Sub-Committee under the auspices of the Welfare Committee is proud to invite nominations for the Woman Engineer Award 2015.

The primary objective of the Award is to recognise the contributions by women engineers. This Award may also incidentally encourage interest in engineering among women and encourage them to strive towards greater excellence. The Award will be presented to the woman engineer who has shown outstanding ability and leadership qualities, or has been a pioneer in any more of the following areas:

- In the design and/or construction of an engineering device or system, structural system, planned development, environmental improvements or,
- In the research and development of engineering device, systems, processes and/or materials, publication of paper or,
- In the teaching of engineering or,
- In the management of engineering projects,
- Entrepreneurship in the commercial sector.

In making the selection, the following criteria will be given special consideration:

- Contribution to the well-being of people and communities
- Resourcefulness in planning and in the solution of design problems
- Pioneering in use of materials and methods
- Innovations in planning, design and construction
- Unusual aspects and aesthetic values

The Award is opened to candidates who are:

- Registered members of the Board of Engineers, Malaysia,
- Malaysian citizens or permanent residents of Malaysia,
- Graduate or Corporate Members of The Institution of Engineers, Malaysia.

The closing date for nominations is **30 September 2014**. Please submit nomination to:

The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, P.O. Box 223 (Jalan Sultan)
46720 Petaling Jaya, Selangor.

The Proposer may or not be a member of IEM or BEM, or an engineer. However, each nomination shall be supported by a brief recommendation from two Referees who are Graduate or Corporate member of IEM. If the Proposer is herself either a Corporate or Graduate member of IEM (or higher), then she may also act as one of the two required Referees.

The nomination form can be downloaded from the IEM website at ***www.myiem.org.my***.

CONTRIBUTIONS TO WISMA IEM BUILDING FUND

RM 2,386,336.70 from IEM Members and Committees

RM 741,502.00 from Private Organisations

TOTAL RM 3,127,838.70

(ANOTHER RM 4,674,654.77 IS NEEDED)

The Institution would like to thank all contributors for donating generously towards the IEM Building Fund

HELP US TO PROVIDE BETTER SERVICES TO YOU AND TO THE FUTURE GENERATION

(The donation list to the Wisma IEM Building Fund is published on page 41)

KEAHLIAN

Note: *This is a continuation of the list which was first published on page 45 of the July 2014 issue.*

PEMOHONAN MENJADI AHLI SISWA

No. Ahli	Nama	Kelayakan
KEJURUTERAAN AWAM		
69700	JASMIN AIDA BT. JOHARI	1ST YEAR (UTM)(CIVIL)
69769	JEFFREY CACKEY AK SYLVESTER SABANG	1ST YEAR (UNIMAS) (CIVIL)
69770	JENIFFER VICTORIA ANAK RATAI	1ST YEAR (UNIMAS) (CIVIL)
69771	JESICCA ANAK JIMBAU	1ST YEAR (UNIMAS) (CIVIL)
69772	JESSICA HENRIETA ANAK JEFFREY	1ST YEAR (UNIMAS) (CIVIL)
69773	JONG SOON TECK	1ST YEAR (UNIMAS) (CIVIL)
69774	JOSEPH TYRAN ANAK MANGUI	1ST YEAR (UNIMAS) (CIVIL)
69701	JULIHAZIRA BT. ALI	1ST YEAR (UTM)(CIVIL)
69775	KEITH ARDAN LUHAT	1ST YEAR (UNIMAS) (CIVIL)
69776	KHAIRULDEEN AZAHAR B. ISMAIL	4TH YEAR (UNIMAS) (CIVIL)
69777	KHUZARINA BT. MARZUKI	1ST YEAR (UNIMAS) (CIVIL)
69778	KONG WEN YEE	1ST YEAR (UNIMAS) (CIVIL)
69779	LAU KIN FEI, JEFFREY	1ST YEAR (UNIMAS) (CIVIL)
69780	LAW HAO FUNG, PERRY	1ST YEAR (UNIMAS) (CIVIL)
69781	LEE KA NYUK	1ST YEAR (UNIMAS) (CIVIL)
69702	LEE KUAN LIM	4TH YEAR (UTM)(CIVIL)
69782	LENNY KOPPER ANAK ENGGU	3RD YEAR (UNIMAS) (CIVIL)
69783	LEO RANDELL ANAK LEWIS	1ST YEAR (UNIMAS) (CIVIL)
69784	LEONG GEOK TENG	1ST YEAR (UNIMAS) (CIVIL)
69785	LIEW KEN MEE, NICOLE TRISH	1ST YEAR (UNIMAS) (CIVIL)
69703	LIM ENG CHUAN	1ST YEAR (UTM)(CIVIL)
69704	LIM YEE CHIH	1ST YEAR (UTM)(CIVIL)
69786	LING HENG TECK, JOHN	1ST YEAR (UNIMAS) (CIVIL)
69544	LIONEL DANNY CHONG	4TH YEAR (IUKL)(CIVIL)
69787	LOUISA DUBAH ANAK HUBERT CHUNGGAT	1ST YEAR (UNIMAS) (CIVIL)
69545	MAHMOUD M H ABOTAHA	3RD YEAR (IUKL)(CIVIL)
69705	MASTURA BT. MOHAMED AMIN	1ST YEAR (UTM)(CIVIL)
69788	MOHAMAD LUQMAN HAKIM B. HASHIM MOHD	1ST YEAR (UNIMAS) (CIVIL)
69789	MOHAMAD NAZRI B. HUSSEN	1ST YEAR (UNIMAS) (CIVIL)
69546	MOHAMED HIDIG FARAH	4TH YEAR (IUKL)(CIVIL)
69547	MOHAMED MALIK ALOBARD ALI	3RD YEAR (IUKL)(CIVIL)
69548	MOHAMMED NABIL ABO TAHER	3RD YEAR (IUKL)(CIVIL)
69549	MOHAMOUD MUSE MOHAMED	4TH YEAR (IUKL)(CIVIL)
69790	MOHD NASSIERIN B. ADENAN	2ND YEAR (UNIMAS) (CIVIL)
69791	MUAZ B. MASLAN	1ST YEAR (UNIMAS) (CIVIL)
69792	MUHAMMAD AIMAN B. MAT GHANI	1ST YEAR (UNIMAS) (CIVIL)
69793	MUHAMMAD FAIQ B. ZAINAL ABIDIN	1ST YEAR (UNIMAS) (CIVIL)
69794	MUHAMMAD FAQIH B. MOHD JAAFAR	1ST YEAR (UNIMAS) (CIVIL)
69550	MUHAMMAD ZAIM B. ABDUL RAHMAN	3RD YEAR (IUKL)(CIVIL)
69706	NABILA NAJAD BT. AJLAN	1ST YEAR (UTM)(CIVIL)
69707	NABILAH BT. BASIRUN	1ST YEAR (UTM)(CIVIL)
69708	NADZIRAH BT. MOHD FOZI	1ST YEAR (UTM)(CIVIL)
69795	NAJWA BT. ISMAIL	1ST YEAR (UNIMAS) (CIVIL)
69796	NINNA AMIRA BT. MAT DAUD	1ST YEAR (UNIMAS) (CIVIL)
69797	NOORAZRINA BT. MD. YATIM	1ST YEAR (UNIMAS) (CIVIL)
69798	NOR INTAN ZAHARAH BT. AHMAD ZAIDI	1ST YEAR (UNIMAS) (CIVIL)
69532	NORASYIKIN BT. YAAKUB	4TH YEAR (UTM)(CIVIL)
69799	NORDIAYANA BT. AZMEY	1ST YEAR (UNIMAS) (CIVIL)
69800	NORSYATHIRAH BT. MAT SHOIB	1ST YEAR (UNIMAS) (CIVIL)
69709	NUR ADILAH BT. MOHD IDRUS	1ST YEAR (UTM)(CIVIL)
69710	NUR AFINI BT. DZULKIFLI	1ST YEAR (UTM)(CIVIL)
69801	NUR AIN BT. ZAM	1ST YEAR (UNIMAS) (CIVIL)
69802	NUR ALIAA BT. MOHAMAD	1ST YEAR (UNIMAS) (CIVIL)
69803	NUR ATIRAH BT. AHMAD MAS DALI	1ST YEAR (UNIMAS) (CIVIL)
69711	NUR AZIRA BT. ALIAS	1ST YEAR (UTM)(CIVIL)
69712	NUR AZLIN BT. BAHARUDIN	1ST YEAR (UTM)(CIVIL)
69713	NUR BALQIS IDAYU BT. MAHMAD RASEN	1ST YEAR (UTM)(CIVIL)
69804	NUR IZYAN BT. WAHAP	1ST YEAR (UNIMAS) (CIVIL)
69805	NUR IZZAH DIYANA BT. YAHAYA	1ST YEAR (UNIMAS) (CIVIL)
69806	NUR KHADIZAH BT. SALLEH	1ST YEAR (UNIMAS) (CIVIL)
69714	NUR LIYANA BT. JAMALUDIN	1ST YEAR (UTM)(CIVIL)
69807	NUR SABRINA BT. RAMLI	1ST YEAR (UNIMAS) (CIVIL)
69715	NUR SHAHIDAH BT. AFTAR ALI	1ST YEAR (UTM)(CIVIL)
69808	NUR SHIFAA BT. NURHAIZAN	1ST YEAR (UNIMAS) (CIVIL)
69809	NUR WAJIHAH BT. ABD HAKIM	1ST YEAR (UNIMAS) (CIVIL)
69716	NURADIHA NAJLA HIDAYU BT. ADIB	1ST YEAR (UTM)(CIVIL)
69717	NURHAFIZAH BT. AHMAD	1ST YEAR (UTM)(CIVIL)
69810	NURIZATULSIMA BT. ABDUL AZIZ	1ST YEAR (UNIMAS) (CIVIL)
69718	NURUL AQILAH BT. ZAINAL	1ST YEAR (UTM)(CIVIL)
69811	NURUL ASYIQIN BT. ABD RAHIM	1ST YEAR (UNIMAS) (CIVIL)
69812	NURUL FAZILLA BT. AHMADI	1ST YEAR (UNIMAS) (CIVIL)
69813	NURUL NADZATUL FARHANA BT. ABDUL HALIM	1ST YEAR (UNIMAS) (CIVIL)
69814	NURUL QURDATU AINI BT. ISMAIL	1ST YEAR (UNIMAS) (CIVIL)
69815	NURUL SITI FATIMAH BT. MATZIN	1ST YEAR (UNIMAS) (CIVIL)
69816	NYEMAS DEWI PRAMITA BT. AIE	1ST YEAR (UNIMAS) (CIVIL)
69551	OMAR SAMIM MOHAMMED SAEED	3RD YEAR (IUKL)(CIVIL)
69817	PATRICK LUMPOH ANAK EMPATIE	1ST YEAR (UNIMAS) (CIVIL)
69818	PHENLEE MISON	1ST YEAR (UNIMAS) (CIVIL)
69719	PO JIA CHUAN	1ST YEAR (UTM)(CIVIL)
69552	PRABGARAN A/L PUNUSAMY	3RD YEAR (IUKL)(CIVIL)
69819	PUA JIA YUNN	1ST YEAR (UNIMAS) (CIVIL)
69533	RABIAH MOHAMAD	4TH YEAR (UTM)(CIVIL)
69820	RACHEL RHER ANAK EDWIN	1ST YEAR (UNIMAS) (CIVIL)
69821	RAFIDAH BT. RAMLI	1ST YEAR (UNIMAS) (CIVIL)
69553	RAMI ISAMELDIN ALI ABDELRAHMAN	4TH YEAR (IUKL)(CIVIL)
69822	RAYNOLD ANAK MERUM	1ST YEAR (UNIMAS) (CIVIL)
69823	ROY ANAK THOMAS	1ST YEAR (UNIMAS) (CIVIL)
69720	SAJEEV NAIR RADAKRISHNAN	1ST YEAR (UTM)(CIVIL)
69824	SALIHAH BT. MOHAMAD SALIM	1ST YEAR (UNIMAS) (CIVIL)
69825	SARAH ANAK DONYSOS	1ST YEAR (UNIMAS) (CIVIL)
69826	SHAHIZATUL AMIZA BT. SAHRIMIN	1ST YEAR (UNIMAS) (CIVIL)
69827	SIBYLLE SULEY ANAK SURIK	1ST YEAR (UNIMAS) (CIVIL)
69721	SIK SERN KHUAN	4TH YEAR (UTM)(CIVIL)
69828	SIM JOO ERN	1ST YEAR (UNIMAS) (CIVIL)
69722	SITI HAMIMAH BT. SAFDIN	1ST YEAR (UTM)(CIVIL)
69829	SITI HUZAIMAH BT. SALAM	1ST YEAR (UNIMAS) (CIVIL)
69723	SITI NADHIRAH BT. ABDUL HAMID	1ST YEAR (UTM)(CIVIL)
69534	SITI NUREHAN BT. OMAR	4TH YEAR (UTM)(CIVIL)
69724	SITTI NUR AISYAH BT. MOHD JAMIN	1ST YEAR (UTM)(CIVIL)
69830	SPENCER ANAK ROGER	1ST YEAR (UNIMAS) (CIVIL)
69831	STEPHANIE SYNNEQ ANAK STEPHEN JANONG	1ST YEAR (UNIMAS) (CIVIL)
69832	TAN CHOON HONG	1ST YEAR (UNIMAS) (CIVIL)
69725	TAN JIA YANG	1ST YEAR (UTM)(CIVIL)
69833	TAN SOON KEN	1ST YEAR (UNIMAS) (CIVIL)
69834	THANISHA A/P CHANDRAN	1ST YEAR (UNIMAS) (CIVIL)
69835	VALENTINE LANGAN AK GAYAU	1ST YEAR (UNIMAS) (CIVIL)
69836	VALENTINO SIGAU LAING	1ST YEAR (UNIMAS) (CIVIL)
69837	VALIANT ANAK DAVID BRANCH	1ST YEAR (UNIMAS) (CIVIL)
69838	VANNYSSA VICTORIA ANAK PATRICK	3RD YEAR (UNIMAS) (CIVIL)
69839	VIKKI DIANE ANAK SAMPAI	1ST YEAR (UNIMAS) (CIVIL)
69840	VINNESPI TERAH LINANG	1ST YEAR (UNIMAS) (CIVIL)
69841	VIVI MERIANA LIAS	1ST YEAR (UNIMAS) (CIVIL)
69726	VYNOTDNI A/P RATHINASAMY	1ST YEAR (UTM)(CIVIL)
69842	WAN AINATUN NADRAH BT. WAN YAHAYA	1ST YEAR (UNIMAS) (CIVIL)
69843	WILSON ROY AK BAKA	1ST YEAR (UNIMAS) (CIVIL)
69844	WONG SIA SIANG	1ST YEAR (UNIMAS) (CIVIL)
69535	ZANALIZAH BT. JAUHARI	4TH YEAR (UTM)(CIVIL)
KEJURUTERAAN BAHAN		
69647	SHAZREEN BT. SULAIMAN	3RD YEAR (UIAM) (MATERIALS)
KEJURUTERAAN BIOPERUBATAN		
69526	JASON HIEW	2ND YEAR (UTAR)(BIO-MEDICAL)
KEJURUTERAAN ELEKTRIKAL		
70086	ABDUL AZIZ B. ABDUL SATAR	3RD YEAR (UTM) (ELECTRICAL)
70087	AHMAD NAZRIN B. ZAKARIA	3RD YEAR (UTM) (ELECTRICAL)
70088	ANG YONG XIAN	1ST YEAR (UTM) (ELECTRICAL)
70089	ARIFF AZRAAI B. ROSLAN	3RD YEAR (UTM) (ELECTRICAL)
69557	AZYYATI BT. AJUDIN	1ST YEAR (UTEM) (ELECTRICAL)
70090	CHAN KAM FAI, EDWARD	1ST YEAR (UTM) (ELECTRICAL)
70091	CHAU CHOK YOA	1ST YEAR (UTM) (ELECTRICAL)
69558	CHE AIN ZULAIKHA BT. CHE ZULKARNAIN	1ST YEAR (UTEM) (ELECTRICAL)
69555	DILDORA ATADJANOVA	1ST YEAR (APU) (ELECTRICAL)
70092	KHOO MING KWAN	1ST YEAR (UTM) (ELECTRICAL)
70093	KONG WEN JIE, JAMES	3RD YEAR (UTM) (ELECTRICAL)
70094	MOHAMAD HAFIDZUDIN B. HARUN	3RD YEAR (UTM) (ELECTRICAL)
69559	MOHAMAD HAKIMIE B. ISMAIL	1ST YEAR (UTEM) (ELECTRICAL)
70095	MOHD AFIQ HAZIQ B. MD JUMADI	3RD YEAR (UTM) (ELECTRICAL)
70096	MUHAMMAD AFIQ B. MOHD NASIR	3RD YEAR (UTM) (ELECTRICAL)
70097	MUHAMMAD HAFIZ B. BADRULHISHAM	3RD YEAR (UTM) (ELECTRICAL)
70098	MUHAMMAD IEZZAT B. KHAIRUDIN	3RD YEAR (UTM) (ELECTRICAL)
69556	MUHAMMAD ZUBAIR SALAHUDDIN CHISHTI	1ST YEAR (APU) (ELECTRICAL)
69560	NG YONG JIE	1ST YEAR (UTEM) (ELECTRICAL)
69561	NOR AIN BT. HALIM	1ST YEAR (UTEM) (ELECTRICAL)
69562	NOR SYAZMEERA BT. ABDUL WAHAB	1ST YEAR (UTEM) (ELECTRICAL)
69563	NORIZAN BT. FAUZI	1ST YEAR (UTEM) (ELECTRICAL)
69554	NURDIYANA BT. ZAHED	3RD YEAR (UMP) (ELECTRICAL)
69564	NURUL FARAHANIE BT. ABDUL RASHID	1ST YEAR (UTEM) (ELECTRICAL)
70099	POH HONG SHENG	1ST YEAR (UTM) (ELECTRICAL)

70100	POH HONG YONG	1ST YEAR (UTM) (ELECTRICAL)
69568	RAIYAN RIYAZ TALKHANI	1ST YEAR (MONASH) (ELECTRICAL)
69565	SYAHIRAH HANANI BT. AHMAD HANAFIAH	1ST YEAR (UTEM) (ELECTRICAL)
70101	TAN CHUN KIT, LEOW	1ST YEAR (UTM) (ELECTRICAL)
69566	TAN JIUNN LIN	1ST YEAR (UTEM) (ELECTRICAL)
70102	TAN YING JIAN	1ST YEAR (UTM) (ELECTRICAL)
70103	THAVENTRAN A/L PANCHANATHAN	1ST YEAR (UTM) (ELECTRICAL)
70104	VINEETHA A/P G. JAYA KUMARAN	2ND YEAR (UTM) (ELECTRICAL)
70105	WONG SOON YAW	1ST YEAR (UTM) (ELECTRICAL)
70106	YEANG MENG HERN	1ST YEAR (UTM) (ELECTRICAL)
70107	YEOH JI HONG	3RD YEAR (UTM) (ELECTRICAL)
70108	YIEW KAH YEE	1ST YEAR (UTM) (ELECTRICAL)
70109	YONG BANG XIANG	1ST YEAR (UTM) (ELECTRICAL)
69567	ZULAIKHA BT. ZOLKEFLI	1ST YEAR (UTEM) (ELECTRICAL)

KEJURUTERAAN ELEKTRONIK

70110	ABANG MOHD ARIF ANAQI B. ABANG ISA	1ST YEAR (UNIMAS) (ELECTRONIC)
70111	ABDUL RAID B. MATJENI	1ST YEAR (UNIMAS) (ELECTRONIC)
70112	AFIQAH BT. BAHARIN	1ST YEAR (UNIMAS) (ELECTRONIC)
70113	AHMAD HELMI B. CHE ROSE	1ST YEAR (UNIMAS) (ELECTRONIC)
70114	AHMAD SYAFIQ B. NORALDIN	1ST YEAR (UNIMAS) (ELECTRONIC)
70115	AINA NAJIAH BT. ABDUL RAZAK	1ST YEAR (UNIMAS) (ELECTRONIC)
70116	AMALINA BT. AFFENDI	1ST YEAR (UNIMAS) (ELECTRONIC)
70117	AMEERUL FIQRI B. ABU BAKAR	1ST YEAR (UNIMAS) (ELECTRONIC)
70118	AMIRAH AFIQAH BT. MAT ZAID	1ST YEAR (UNIMAS) (ELECTRONIC)
70119	AMY SAHIDA BT. SOETARMAN	4TH YEAR (UNIMAS) (ELECTRONIC)
70120	ANDRAHYZER TEKOSTER ANAK ANYAP	1ST YEAR (UNIMAS) (ELECTRONIC)
70121	ARIZAM B. ABI	4TH YEAR (UNIMAS) (ELECTRONIC)
70122	AUDREY TAWE JILING	1ST YEAR (UNIMAS) (ELECTRONIC)
70123	AVYLIA NOAMI ANAK NELSON	1ST YEAR (UNIMAS) (ELECTRONIC)
70124	BONG JU SHIN	1ST YEAR (UNIMAS) (ELECTRONIC)
70125	CHAN IAN ALFONSO	2ND YEAR (UNIMAS) (ELECTRONIC)
69570	CHANG MENG KIT	1ST YEAR (UTAR) (ELECTRONIC)
69571	CHOONG YEW SIING	1ST YEAR (UTAR) (ELECTRONIC)
70126	CHRISTIAN JOHN	1ST YEAR (UNIMAS) (ELECTRONIC)
70127	CHUA TEN HOU	1ST YEAR (UNIMAS) (ELECTRONIC)
70128	CYNTHIA GILBERT YAMAN	3RD YEAR (UNIMAS) (ELECTRONIC)
69581	ELLIYANA FAZLIN BT. ISHAK	4TH YEAR (UTEM) (ELECTRONIC)
70129	ELMA LOYANTO ANAK BRONIE	1ST YEAR (UNIMAS) (ELECTRONIC)
70130	ERNAWATY BT. REDUAN	1ST YEAR (UNIMAS) (ELECTRONIC)
69582	FATIN AZRIN BT. MUHAMMAD EFANDI	4TH YEAR (UTEM) (ELECTRONIC)
70131	FATIN NUR IZZATI BT. MOHD JIZAD	1ST YEAR (UNIMAS) (ELECTRONIC)
70132	FINLAYSON RUSELL ANJIE ANAK EDWIN	1ST YEAR (UNIMAS) (ELECTRONIC)
70133	FRELESION FIONA ANAK YULID	2ND YEAR (UNIMAS) (ELECTRONIC)
70134	GOH JU HAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70135	HAFIZAH BT. MATSULUDIN	1ST YEAR (UNIMAS) (ELECTRONIC)
70136	HASBAH BT. MOHAMAD HASHIM	1ST YEAR (UNIMAS) (ELECTRONIC)
70137	HIDAYATI BT. KELANA	1ST YEAR (UNIMAS) (ELECTRONIC)
70138	HUMAIRA BT. ABDUL HAYI	1ST YEAR (UNIMAS) (ELECTRONIC)
70139	ISAAC WAN PHILIP	1ST YEAR (UNIMAS) (ELECTRONIC)
70140	IZZAT B. ZAINAL ABIDIN	1ST YEAR (UNIMAS) (ELECTRONIC)
70141	JOSEF ANAK JONIP	4TH YEAR (UNIMAS) (ELECTRONIC)
70142	JOSELYN JOK	1ST YEAR (UNIMAS) (ELECTRONIC)
70143	KHAIRUL ANWAR B. ZAINAL ABIDIN	1ST YEAR (UNIMAS) (ELECTRONIC)
70144	LAWRINCE TAPA	1ST YEAR (UNIMAS) (ELECTRONIC)
69572	LAXSHMI A/P SUBRAMANIAN	1ST YEAR (UTAR) (ELECTRONIC)
69573	LEI YEE FOOK	1ST YEAR (UTAR) (ELECTRONIC)
69574	LIEW SHIN YING	2ND YEAR (UTAR) (ELECTRONIC)
69592	LIM HWEI EAN	3RD YEAR (MMU) (ELECTRONIC)
70145	LIM WEI CHIEN, WILSON	1ST YEAR (UNIMAS) (ELECTRONIC)
69575	LINA YU HENG	1ST YEAR (UTAR) (ELECTRONIC)
70146	LOH SIAW HUI, RUTH	1ST YEAR (UNIMAS) (ELECTRONIC)
70147	LUQMANULHAKIM B. MOHD AMIR	1ST YEAR (UNIMAS) (ELECTRONIC)
70148	MELVIN ANAK PHILIP ATTAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70149	MERVIN ANAK ROVER	1ST YEAR (UNIMAS) (ELECTRONIC)
70150	MICHELLE ANAK CHRISTIE	1ST YEAR (UNIMAS) (ELECTRONIC)
69576	MOH CAI WEI	2ND YEAR (UTAR) (ELECTRONIC)
70151	MOHAMAD ASRAF B. ABDUL RAHIM	1ST YEAR (UNIMAS) (ELECTRONIC)
69583	MOHAMAD FAIQ B. CHE ZAKI	4TH YEAR (UTEM) (ELECTRONIC)
70152	MOHAMAD IZUDDIN B. YASIP	1ST YEAR (UNIMAS) (ELECTRONIC)
70153	MOHAMAD KAMAL NAJIB B. SHAKIR	1ST YEAR (UNIMAS) (ELECTRONIC)
70154	MOHAMMAD RAZEEN B. MOHD ROSLAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70155	MOHAMMAD ZAKI MUTHAHHARI B. SHOLAHUDDIN	1ST YEAR (UNIMAS) (ELECTRONIC)
69584	MOHD ADDIE B. AMIR	4TH YEAR (UTEM) (ELECTRONIC)
70156	MOHD AMIRUL SAIFUAZHAR	2ND YEAR (UNIMAS) (ELECTRONIC)
70157	MOHD HELMI B. MUSTAFA	1ST YEAR (UNIMAS) (ELECTRONIC)
70158	MOHD NAZREEN B. KHALID	1ST YEAR (UNIMAS) (ELECTRONIC)
69585	MOHD SHAIKHUL KHALID B. ABDULLAH	4TH YEAR (UTEM) (ELECTRONIC)
70159	MOHD SYAHNIZAM B. GARIP	1ST YEAR (UNIMAS) (ELECTRONIC)
70160	MUHAMAD ADAM FITRI B. MOKLAS	1ST YEAR (UNIMAS) (ELECTRONIC)
70161	MUHAMMAD ATIF B. NORZAN SHAH	1ST YEAR (UNIMAS) (ELECTRONIC)
70162	MUHAMMAD FAQIH MUHSIN B. MOHAMMAD GUNAWAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70163	MUHAMMAD SHAFIQ AZHARI B. MOHD HAFIDZ	1ST YEAR (UNIMAS) (ELECTRONIC)
70164	MUHAMMAD SHAFIQ B. KAMARULZAMAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70165	MUHAMMAD YUSUF MUSADDIQ B. MOHD AKMAL	1ST YEAR (UNIMAS) (ELECTRONIC)
70166	NABILAH BT. AHMAD	1ST YEAR (UNIMAS) (ELECTRONIC)
70167	NG JIUN YUE	1ST YEAR (UNIMAS) (ELECTRONIC)
70168	NICHOLAS DAWN ANAK EDWIN AMIN	4TH YEAR (UNIMAS) (ELECTRONIC)
69586	NOOR AKMAL BT. AB BAKAR	4TH YEAR (UTEM) (ELECTRONIC)
69587	NOORSHAFIRA LIANA BT. KAMARUDDIN	4TH YEAR (UTEM) (ELECTRONIC)
70169	NOR AZRA BT. WAHAB	1ST YEAR (UNIMAS) (ELECTRONIC)
70170	NOR ZURAYA BT. FAUZI	1ST YEAR (UNIMAS) (ELECTRONIC)
70171	NORALINI BT. SUDIN	1ST YEAR (UNIMAS) (ELECTRONIC)
70172	NORIZZATI BT. KAMARUZAMAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70173	NUR AFIFAH BT. ISMAIL	1ST YEAR (UNIMAS) (ELECTRONIC)
69588	NUR AINNE BT. HAZEMI	4TH YEAR (UTEM) (ELECTRONIC)
70174	NUR AMIRAH BT. ZAKARIA	1ST YEAR (UNIMAS) (ELECTRONIC)
70175	NUR ASHIKIN BT. MOHD BUJANG	1ST YEAR (UNIMAS) (ELECTRONIC)
70176	NUR AZIE HAZMIDA BT. ABDUL HAZIS	1ST YEAR (UNIMAS) (ELECTRONIC)
70177	NUR FARHANAH BT. ABU BAKAR	1ST YEAR (UNIMAS) (ELECTRONIC)
70178	NUR HAZIYAH BT. MOHAMAD RAZALI	1ST YEAR (UNIMAS) (ELECTRONIC)
70179	NUR INTAN NAZIHAH BT. SALLEH	1ST YEAR (UNIMAS) (ELECTRONIC)
70180	NUR IZZATI ATHIRAH BT. MOHD RADZI	1ST YEAR (UNIMAS) (ELECTRONIC)
70181	NUR MULTAZIMAH BT. ADENAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70182	NUR QURRATU AINI BT. ZAINI	2ND YEAR (UNIMAS) (ELECTRONIC)
70183	NURA ADILA BT. ABDUL HALIM	1ST YEAR (UNIMAS) (ELECTRONIC)
70184	NURFAUZIANI ABBAS BT. ABU BAKAR	1ST YEAR (UNIMAS) (ELECTRONIC)
70185	NURUL ATIQAH BT. JEMIEN	1ST YEAR (UNIMAS) (ELECTRONIC)
69589	NURUL NADIA BT. ZOLJESLI	4TH YEAR (UTEM) (ELECTRONIC)
70186	PANG SZE KOI	1ST YEAR (UNIMAS) (ELECTRONIC)
70187	PATRUS MAXSION ANAK TINGGAL	1ST YEAR (UNIMAS) (ELECTRONIC)
70188	PHILIVIANA CLYRON PATRICK	1ST YEAR (UNIMAS) (ELECTRONIC)
70189	PHUA JUN MING, BRANDON	1ST YEAR (UNIMAS) (ELECTRONIC)
69569	RAFFIQ SYAZWAN B. DATO HJ RUSLI	2ND YEAR (UTM) (ELECTRONIC)
70190	RAFIDAH BT. KEMAT	1ST YEAR (UNIMAS) (ELECTRONIC)
69590	RAIHANAHUDA BT. RAZALI	4TH YEAR (UTEM) (ELECTRONIC)
70191	RHONDA ASHLEY ANAK JABAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70192	RICK FALCO POLODIUS	1ST YEAR (UNIMAS) (ELECTRONIC)
69593	SHAMALA A/P MANIAM	3RD YEAR (MMU) (ELECTRONIC)
70193	SHARIFAH NOOR INTAN FATIMAH BT. SYED ZAID	1ST YEAR (UNIMAS) (ELECTRONIC)
70194	SITI HABIBAH BT. JAMIL	1ST YEAR (UNIMAS) (ELECTRONIC)
70195	SITI HAJAR ABDUL AZIZ	1ST YEAR (UNIMAS) (ELECTRONIC)
69591	SITI HAWA BT. ZAINAL	4TH YEAR (UTEM) (ELECTRONIC)
70196	SITI NUR AMMARAH THAQIFAH BT. ROSLAN	1ST YEAR (UNIMAS) (ELECTRONIC)
70197	SITI QURAISYA BT. JUNAIDI	1ST YEAR (UNIMAS) (ELECTRONIC)
70198	SYED MUHAMMAD HAMDI B. SYED AHMAD	1ST YEAR (UNIMAS) (ELECTRONIC)
70199	TAN CHOON YEN, AGNES	1ST YEAR (UNIMAS) (ELECTRONIC)
69577	TAN WEI CHUEN, ANDREW	4TH YEAR (UTAR) (ELECTRONIC)
69578	TAN YAN NI	2ND YEAR (UTAR) (ELECTRONIC)
69579	TEO JUN YI	1ST YEAR (UTAR) (ELECTRONIC)
70200	TEO PUI LIK, PHILIP	1ST YEAR (UNIMAS) (ELECTRONIC)
69580	THEE KANG WEI	1ST YEAR (UTAR) (ELECTRONIC)
69610	CHUA WEE LI	1ST YEAR (UTAR) (INDUSTRIAL)

KEJURUTERAAN INDUSTRI

69611	JASPER CHAN	1ST YEAR (UTAR) (INDUSTRIAL)
69612	KAN MUN CHUN	1ST YEAR (UTAR) (INDUSTRIAL)
69613	LEE WEN KANG	1ST YEAR (UTAR) (INDUSTRIAL)
69614	NG KAI BIN, KELVIN	1ST YEAR (UTAR) (INDUSTRIAL)

KEJURUTERAAN KIMIA

70064	ABD. RAQIB B. PIEE	1ST YEAR (UNIMAS) (CHEMICAL)
70011	AMIRUL AFIQ HAMIZAN B. M. ROSLAN	1ST YEAR (UTM) (CHEMICAL)
70012	ARIVIND A/L MANOGARAN	2ND YEAR (UTM) (CHEMICAL)
70013	ARVIND A/L SIRALAN	1ST YEAR (UTM) (CHEMICAL)
70014	BALACHANDARAN A/L PERIASAMY	1ST YEAR (UTM) (CHEMICAL)
70015	CHAI SIU JUAN	1ST YEAR (UTM) (CHEMICAL)
70016	CHONG BOON HONG	1ST YEAR (UTM) (CHEMICAL)
69527	CHONG JIAN BIN	1ST YEAR (UTAR) (CHEMICAL)
70065	CHONG LI YEE	1ST YEAR (UNIMAS) (CHEMICAL)
70066	CORNEELIA ANAK TEDONG	1ST YEAR (UNIMAS) (CHEMICAL)
70067	CYREEN ANAK GIMAN	1ST YEAR (UNIMAS) (CHEMICAL)
70068	DAYANG SITI HERDAWATI BT. ABANG HARDIN	1ST YEAR (UNIMAS) (CHEMICAL)
70017	DINESH A/L ARUMUGAM	1ST YEAR (UTM) (CHEMICAL)
70018	DIVYA A/P KALIAPPAN	1ST YEAR (UTM) (CHEMICAL)
70019	DIVYA BARATHI A/P R. SAKTHIVEL	1ST YEAR (UTM) (CHEMICAL)
70020	FARAH NATASHA BT. ZAINUDDIN	3RD YEAR (UTM) (CHEMICAL)
70069	HANSEL DINA B. JOHN	1ST YEAR (UNIMAS) (CHEMICAL)
70021	HENG KHUAN EU	1ST YEAR (UTM) (CHEMICAL)

KEAHLIAN

70070	KA JEN HAU, BRANDON	1ST YEAR (UNIMAS) (CHEMICAL)
70022	KHOO CHIU FONG	1ST YEAR (UTM) (CHEMICAL)
70023	KU MOHAMAD AFIQ B. KU ARSHAD	1ST YEAR (UTM) (CHEMICAL)
70024	LAI YEE QING	1ST YEAR (UTM) (CHEMICAL)
70025	LEE CHIN	1ST YEAR (UTM) (CHEMICAL)
70071	LEE SHIN NUO, LYDIA	1ST YEAR (UNIMAS) (CHEMICAL)
69528	LING HUAN HORNG	4TH YEAR (UTAR) (CHEMICAL)
70026	LOGANATHAN A/L KRISHNAN	2ND YEAR (UTM) (CHEMICAL)
70027	LOO LIAN YUAN	1ST YEAR (UTM) (CHEMICAL)
69529	MAGESWARY A/P MANIKAM	1ST YEAR (UTAR) (CHEMICAL)
69531	MARIE JENNIFER JOSEPH ALBERT RAVI	1ST YEAR (UTAR) (CHEMICAL)
70028	MARK JULEX DAVID DUMAU	2ND YEAR (UTM) (CHEMICAL)
70072	MARTHA STEPHANIE ANAK DAVIS	1ST YEAR (UNIMAS) (CHEMICAL)
70029	MAYA VINOTHINI A/P PANNIRSELVAM	1ST YEAR (UTM) (CHEMICAL)
70030	MOH YEE KHIM	1ST YEAR (UTM) (CHEMICAL)
70031	MOH YU HAN	1ST YEAR (UTM) (CHEMICAL)
70073	MOHD IDRIS B. IBRAHIM	1ST YEAR (UNIMAS) (CHEMICAL)
70032	MUHAMAD AMIRULLAH B. ABDUL RAHMAN	2ND YEAR (UTM) (CHEMICAL)
70074	MUHAMAD SHAIEZAD AIMAN B. AYUB	1ST YEAR (UNIMAS) (CHEMICAL)
70033	MUHAMMAD ALIF ASYRAF B. AMIN	2ND YEAR (UTM) (CHEMICAL)
70034	MUHAMMAD FITRI B. SAIDI	2ND YEAR (UTM) (CHEMICAL)
70075	NANCY KALANG	1ST YEAR (UNIMAS) (CHEMICAL)
70076	NOOR SYAZWANI BT. SALIM	1ST YEAR (UNIMAS) (CHEMICAL)
70035	NORFIONA BT. ROSLI	2ND YEAR (UTM) (CHEMICAL)
70036	NORSHAHIRAH BT. MOHD JADI	2ND YEAR (UTM) (CHEMICAL)
70037	NUR ADINA SHAHIDAH BT. MOHD YAMIN	2ND YEAR (UTM) (CHEMICAL)
70077	NUR FARIHEEN NATASHA BT. SELEMAN	1ST YEAR (UNIMAS) (CHEMICAL)
70038	NUR FATEHA BT. MD NOR	2ND YEAR (UTM) (CHEMICAL)
70039	NUR JANNAH BT. HARUN	2ND YEAR (UTM) (CHEMICAL)
70040	NURUL AQILAH BT. MOHD HABIB	2ND YEAR (UTM) (CHEMICAL)
70041	NURUL AZIRA BT. NAZALI	2ND YEAR (UTM) (CHEMICAL)
70078	OUDREY THOMAS NGAU	1ST YEAR (UNIMAS) (CHEMICAL)
70042	PARAKASHWARAN NAIR A/L V. GOPALAN NAIR	1ST YEAR (UTM) (CHEMICAL)
70043	PRAVEEN RAAJ A/L SIVASUBRAMANIAM	1ST YEAR (UTM) (CHEMICAL)
70044	RAVINDRAN A/L PERIMAL	1ST YEAR (UTM) (CHEMICAL)
70079	RICKY ANAK TUBAM	1ST YEAR (UNIMAS) (CHEMICAL)
70045	SAARWINDREN A/L S. KANNAN	1ST YEAR (UTM) (CHEMICAL)
70046	SATYASURIYA A/L ULAGANATHAN	1ST YEAR (UTM) (CHEMICAL)
70080	SAVENA ANAK FABIAN	1ST YEAR (UNIMAS) (CHEMICAL)
70047	SAVITRA A/P MANOHKARAN	1ST YEAR (UTM) (CHEMICAL)
70048	SHARVINI A/P SIVA RAMAN	1ST YEAR (UTM) (CHEMICAL)
70049	SITI FATIMAH BT. SAAD	2ND YEAR (UTM) (CHEMICAL)
70081	SITI NUR SHAFINA BT. SABARUDDIN	1ST YEAR (UNIMAS) (CHEMICAL)
70050	SITI NURATIKAH BT. YAHYA	2ND YEAR (UTM) (CHEMICAL)
70082	SYED MUHAMMAD SYAFIE B. WAN SAIFUL BAHARI	1ST YEAR (UNIMAS) (CHEMICAL)
70051	TAN CHUAN HENG	1ST YEAR (UTM) (CHEMICAL)
70052	TAN SHIAU NEE	1ST YEAR (UTM) (CHEMICAL)
70053	TAN YI LING	1ST YEAR (UTM) (CHEMICAL)
70054	TAN YOONG KAI	1ST YEAR (UTM) (CHEMICAL)
70055	TEH SIN HUI	1ST YEAR (UTM) (CHEMICAL)
70056	THIEM WHO KEET	1ST YEAR (UTM) (CHEMICAL)
70083	UMMIE ZULAIKHA BT. KAMARUL JAMAN	1ST YEAR (UNIMAS) (CHEMICAL)
70057	VAANMATHI A/P DORAISAMMY	1ST YEAR (UTM) (CHEMICAL)
70058	VADIVELLAN A/L ARUMUGAM	1ST YEAR (UTM) (CHEMICAL)
70059	VOON HUI CHIN	1ST YEAR (UTM) (CHEMICAL)
70084	WINNIE ANAK RENANG	1ST YEAR (UNIMAS) (CHEMICAL)
69530	WONG SHI WEI, SYLVIA	1ST YEAR (UTAR) (CHEMICAL)
70085	YAP CHAI YIENG	1ST YEAR (UNIMAS) (CHEMICAL)
70060	YAP JIAN JIE	1ST YEAR (UTM) (CHEMICAL)
70061	YASMIN MUNIRAH BT. MAT ZAINI	2ND YEAR (UTM) (CHEMICAL)
70062	YUVITTHA A/P VELLASAMY	1ST YEAR (UTM) (CHEMICAL)
70063	ZUHRA BT. ABD RAHMAN	2ND YEAR (UTM) (CHEMICAL)

KEJURUTERAAN MEKANIKAL

69901	ABANG AMIRUDDIN B. ABANG JUNAIDI	1ST YEAR (UNIMAS) (MECHANICAL)
69845	ABDUL MALIK B. SHAARI	2ND YEAR (UTM) (MECHANICAL)
69648	ABDUL PAIZAL B. MOHD ZAIN	3RD YEAR (UTEM) (MECHANICAL)
69846	ADI AISAR B. ZUBBIR	3RD YEAR (UTM) (MECHANICAL)
69676	AFIQ JUWAIDI B. JAMALUDIN	4TH YEAR (PUO) (MECHANICAL)
69902	AGIE ALFIE B. HAMIR	1ST YEAR (UNIMAS) (MECHANICAL)
69847	AHMAD FAIQ WAFI B. AB. PATAH	1ST YEAR (UTM) (MECHANICAL)
69650	AHMAD RAHIMI B. MAHMUD NASIR	1ST YEAR (UKM) (MECHANICAL)
69903	AINA ATIKA BT. AZMAN	1ST YEAR (UNIMAS) (MECHANICAL)
69848	AKMAL B. IBRAHIM	1ST YEAR (UTM) (MECHANICAL)
69904	ALBANIAH BT. ABU HASSAN	1ST YEAR (UNIMAS) (MECHANICAL)
69905	ALBERT KEDU ANAK MUJAH	4TH YEAR (UNIMAS) (MECHANICAL)
69906	ALEXANDER ELVIN ANAK LEE	1ST YEAR (UNIMAS) (MECHANICAL)
69907	ALISTAIR GILBERT ANAK SIMON	1ST YEAR (UNIMAS) (MECHANICAL)
69849	AMIRAH BT. ZAKARIA @ BIRAYA	1ST YEAR (UTM) (MECHANICAL)
69908	AMIRAH MAZLIN BT. ABU BAKAR	1ST YEAR (UNIMAS) (MECHANICAL)
69651	AMJAD B. AMRAN	1ST YEAR (UKM) (MECHANICAL)
69909	AMRIE B. HATTA	1ST YEAR (UNIMAS) (MECHANICAL)
69910	ANDREE PAUSEK	1ST YEAR (UNIMAS) (MECHANICAL)
69850	ANG WEI LUNG	1ST YEAR (UTM) (MECHANICAL)
69851	ANIS ADRINA BT. RIDHWAN TAN	2ND YEAR (UTM) (MECHANICAL)
69852	ANIS AMIRA BT. MAT ZUKI	1ST YEAR (UTM) (MECHANICAL)
69652	ARNOLD YAMIL	1ST YEAR (UKM) (MECHANICAL)
69853	ARVIN RAO A/L SUBRAMANIAM	1ST YEAR (UTM) (MECHANICAL)
69653	ASLIAH BT. SEHARING	1ST YEAR (UKM) (MECHANICAL)
69854	AUGENY SATIK ANAK AYAK	1ST YEAR (UTM) (MECHANICAL)
69911	AUGUSTUS GALANG ANAK MINGGU	1ST YEAR (UNIMAS) (MECHANICAL)
69912	AZAMAN B. JAJOL	1ST YEAR (UNIMAS) (MECHANICAL)
69913	AZMANULFITRI B. JAMALUDIN	1ST YEAR (UNIMAS) (MECHANICAL)
69914	AZMEERA BT. SHAIBI	1ST YEAR (UNIMAS) (MECHANICAL)
69915	AZNOL SANJAN B. LOKMAN HAKIM	1ST YEAR (UNIMAS) (MECHANICAL)
69654	BHAVANI A/P LOGAN	1ST YEAR (UKM) (MECHANICAL)
69916	BONG KUEK KONG	1ST YEAR (UNIMAS) (MECHANICAL)
69917	BRIAN WAN MARTIN	1ST YEAR (UNIMAS) (MECHANICAL)
69918	BRYAN GRANG ANAK MORSE	1ST YEAR (UNIMAS) (MECHANICAL)
69919	CAROL SANDRA ANAK APEE	1ST YEAR (UNIMAS) (MECHANICAL)
69655	CHAN YONG WEI	2ND YEAR (UKM) (MECHANICAL)
69855	CHANG LIN SONG	1ST YEAR (UTM) (MECHANICAL)
69856	CHAW VUI KEN, KENNETH	1ST YEAR (UTM) (MECHANICAL)
69857	CHE KU NUR NADIA HIJRAH BT. CHE KU ADNAN	1ST YEAR (UTM) (MECHANICAL)
69858	CHEE KWEEN WAI	1ST YEAR (UTM) (MECHANICAL)
69656	CHENG BOON HOW	2ND YEAR (UKM) (MECHANICAL)
69920	DAYANG NUR FARAH ZURINA BT. AWG SALLEH	1ST YEAR (UNIMAS) (MECHANICAL)
69921	DENNIS YII ANAK KEDING	1ST YEAR (UNIMAS) (MECHANICAL)
69922	DOMINIC SANCHEZ ANAK MEROM	1ST YEAR (UNIMAS) (MECHANICAL)
69923	DYLAN SMITH TAWIR ANAK LUKING	1ST YEAR (UNIMAS) (MECHANICAL)
69924	EASTER IZZALINE ANAK MELI	1ST YEAR (UNIMAS) (MECHANICAL)
69925	EMERALD MICHELLE ANAK SULONG	1ST YEAR (UNIMAS) (MECHANICAL)
69859	ERAM SABARI JEEVA A/L BALAKRISHNAN	1ST YEAR (UTM) (MECHANICAL)
69926	EUGENE ANAK JACKSON JOY	1ST YEAR (UNIMAS) (MECHANICAL)
69927	EVENGELISTA KELAMA	1ST YEAR (UNIMAS) (MECHANICAL)
69928	FAIZ B. OTHMAN	1ST YEAR (UNIMAS) (MECHANICAL)
69860	FATIMAH BT. MD ZAINI	1ST YEAR (UTM) (MECHANICAL)
69861	FRENESTER ANAK KIDIN	1ST YEAR (UTM) (MECHANICAL)
69929	G. SANGARI A/P GAJENDRAN	1ST YEAR (UNIMAS) (MECHANICAL)
69862	GAN WEE MENG	1ST YEAR (UTM) (MECHANICAL)
69863	GARY SCHWARTZENNER ANAK GICHAI	1ST YEAR (UTM) (MECHANICAL)
69930	GOGILAN A/L THAMILSELVAM	1ST YEAR (UNIMAS) (MECHANICAL)
69864	HAIFAA ZIRA BT. MAT IBRAHIM	1ST YEAR (UTM) (MECHANICAL)
69931	HAYMILTON YEARNE MELVIN	1ST YEAR (UNIMAS) (MECHANICAL)
69932	HILLARY ASSAN ANAK LIAM	1ST YEAR (UNIMAS) (MECHANICAL)
69865	HO WOON PING	1ST YEAR (UTM) (MECHANICAL)
69933	IVAN ISAAC ANAK THOMAS	1ST YEAR (UNIMAS) (MECHANICAL)
69934	IZZAT HAZIQ B. ABDULLAH	1ST YEAR (UNIMAS) (MECHANICAL)
69866	JASON SELAU KUMAR A/L PAUL	1ST YEAR (UTM) (MECHANICAL)
69935	JOEL ANAK NGIKOH @ NYIKOH	1ST YEAR (UNIMAS) (MECHANICAL)
69936	JOHN ANAK INYANG	1ST YEAR (UNIMAS) (MECHANICAL)
69937	JUDE LENT JOEM	1ST YEAR (UNIMAS) (MECHANICAL)
69867	JULIO JAUNIS	1ST YEAR (UTM) (MECHANICAL)
69938	KELVIN COSTNER JANGGU AK BADA	1ST YEAR (UNIMAS) (MECHANICAL)
69939	KHAIRUL AZFAR B. NURUDDIN	1ST YEAR (UNIMAS) (MECHANICAL)
69940	KHAIRUNISA BT. KAMARUDIN	1ST YEAR (UNIMAS) (MECHANICAL)
69941	KHAIRUNNISA BT. ZAINUDIN	1ST YEAR (UNIMAS) (MECHANICAL)
69868	KRISTY ANNE NUNIS	1ST YEAR (UTM) (MECHANICAL)
69869	KUGAANESAN A/L PERIYASAMY	1ST YEAR (UTM) (MECHANICAL)
69870	LEE JUN HAO	1ST YEAR (UTM) (MECHANICAL)
69871	LEE SHENG PING	1ST YEAR (UTM) (MECHANICAL)
69942	LIM SHING YONG, MICHELLE	1ST YEAR (UNIMAS) (MECHANICAL)
69872	LIM YUNG KIAT, DANIEL	1ST YEAR (UTM) (MECHANICAL)
69873	LIM ZHENG YOU	1ST YEAR (UTM) (MECHANICAL)
69874	LING CHEE HUAT	1ST YEAR (UTM) (MECHANICAL)
69943	LOYRITA DULLINA ANAK PANTAU	1ST YEAR (UNIMAS) (MECHANICAL)
69944	LUCIA ANAK CHANG EMBO	1ST YEAR (UNIMAS) (MECHANICAL)
69945	LUQMAN B. ABDUL KHALEK	1ST YEAR (UNIMAS) (MECHANICAL)
69946	MACOUVER NG	1ST YEAR (UNIMAS) (MECHANICAL)
69947	MAJORIE TELUN AVIT	1ST YEAR (UNIMAS) (MECHANICAL)
69948	MAS ADILAH BT. MAHAMOOD AHAMAD	1ST YEAR (UNIMAS) (MECHANICAL)
69949	MAS NOR ZAMIRLAH BT. ZAMIRHAN	1ST YEAR (UNIMAS) (MECHANICAL)
69875	MASITAH BT. OSMAN	1ST YEAR (UTM) (MECHANICAL)

Note: *Remaining list would be published in the September 2014 issue. For the list of approved "ADMISSION TO THE GRADE OF STUDENT", please refer to IEM web portal at http://www.myiem.org.my.*