Celebrating 50 Years of Engineering Excellence

23 July 2015

Media Release

The Institution of Engineers, Singapore (IES) Awards Lifetime Accolade to Engineering Pioneer in Environmental and Water Management and Recognises Notable Local Engineering Projects

Mr. Chan Chun Sing presents awards at the World Engineers Summit (WES) on Climate Change 2015 Gala Dinner and Awards Night

Event marks the end of two-day high-level dialogue amongst international climate change experts and engineers

The Institution of Engineers, Singapore (IES) presented the IES Lifetime Engineering Achievement Award 2015 and the IES Prestigious Engineering Achievement Awards 2015 at the World Engineers Summit (WES) on Climate Change 2015 Gala Dinner and Awards Night today. Mr. Chan Chun Sing, Minister, Prime Minister's Office and Secretary-General, National Trades Union Congress (NTUC) graced the event as the guest-of-honour.

International and local engineers and climate change experts and professionals gathered at the dinner, after two days of discussion on 'Sustainable Urban Development for Global Climate Resilience' at the second WES hosted by IES.

IES Lifetime Engineering Achievement Award

IES awarded Er. Tan Gee Paw with the third IES Lifetime Engineering Achievement Award in recognition of his significant contributions to Singapore in ensuring the sustainability of its water supply. The award is conferred upon individuals whose lifetime accomplishments and achievements have made profound impact on the engineering industry and community and have brought national or international honours to Singapore.

"Er Tan Gee Paw has dedicated a great part of his life to ensure that our island, which lacks one of the most essential natural resources, is assured of a sustainable water supply. For his exceptional foresight, dedication and accomplishments, he is a fully worthy recipient of the IES Lifetime Engineering Achievement Award. Er. Tan has proven himself to be a great role model to raise the profile of engineers amongst the public and interest the young to take up engineering as a career," said Er. Chong Kee Sen, President, IES.

"One of the best traditions of the engineering profession is the quiet dedication of engineers to nation building and service to society with little thought of recognition. My colleagues who have worked with me for the past five decades uphold this fine tradition. The IES Lifetime Engineering Achievement Award is therefore an award for all my colleagues in the engineering profession who have given many decades of their lives in service to society and the nation," said Er. Tan.

IES Prestigious Engineering Achievement Awards

To recognise outstanding engineering projects which have made a significant contribution to the engineering progress and quality of life in Singapore, IES awarded 13 engineering teams with the IES Prestigious Engineering Achievement Awards. These winners have been selected from 25 entries based on their contribution to the well-being of people and communities; resourcefulness in the planning and solving of design problems; pioneering use of materials and methods; innovations in planning, design and construction as well as unique aspects and aesthetic values.

"The winners of the IES Prestigious Engineering Achievement Awards 2015 demonstrate the diversity of engineering, from innovating materials that significantly reduce the requirements for air-conditioning to enabling cost-effective eye-screening for glaucoma detection. Regardless of their engineering discipline, each winning team exhibits distinctive value in enhancing the quality of our lives and our environment. We congratulate every one of them and hope that the awards will motivate them to continue to scale even greater heights," said Er. Ho Siong Hin, Chairman, Awards Committee, IES.

With five winning entries, A*STAR emerged as the biggest winner of the night for the third consecutive year. Winning projects submitted by A*STAR include 'The Future of Audit: Predictive Analytics on Irregularities and Risks in Bank Branches' and 'Speak to Me in My Language' translation technology.

"A*STAR is delighted to be recognised at the IES Prestigious Engineering Achievement Awards. These awards underscore A*STAR's commitment to undertake innovative research leading to products and processes that can be adopted by companies to raise their competitiveness. We are dedicated to drive for excellence and forging partnerships with companies to grow our industries," said Dr Raj Thampuran, Managing Director of Agency for Science, Technology and Research.

Annexes:

1. Citation – Er. Tan Gee Paw, IES Lifetime Engineering Achievement Award 2015 Winner
2. Citations – 13 winning projects of IES Prestigious Engineering Achievement Awards 2015

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Chinese Terms

The Institution of Engineers, Singapore (IES)
新加坡工程师学会

About The Institution of Engineers, Singapore (IES)

The Institution of Engineers, Singapore (IES) was formally established in July 1966 as the national society of engineers in Singapore. IES is the premier engineering institution in Singapore and is called upon by the Government to provide feedback on professional engineering matters.

IES is well represented among the faculty members of the major engineering institutions of higher learning in Singapore. Through close collaboration with the local universities and polytechnics, IES organises courses, seminars and talks for engineers and IES members to advance the continuous development of engineers.

The Institution maintains close links with professional organisations of engineers regionally and throughout the world. These include organisations in Australia, China, Japan, United Kingdom and the United States. The Institution also represents Singapore in the ASEAN Federation of Engineering Organizations (AFEO) and the Federation of Engineering Institutions of Asia and the Pacific (FEIAP) in promoting goodwill, fellowship and exchange of knowledge among all engineers in ASEAN and the Asia-Pacific region.

Through its Engineering Accreditation Board (EAB), IES obtained full signatory status in the Washington Accord (WA) in June 2006. The entry grants IES the authority to represent Singapore, the first country within the ASEAN region which has obtained full signatory status in the WA, to vet education systems under the WA mutual recognition framework.

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Annex 1

IES Lifetime Engineering Achievement Award – Citation

Er. Tan Gee Paw

Er. Tan Gee Paw graduated with a Bachelor of Engineering, First Class Honours degree, from the University of Malaya in 1967 and a Master of Science (Systems Engineering) degree from the University of Singapore in 1971. He also holds the honorary degrees of Doctor of Science from University of Westminster, Doctor of Engineering from Sheffield University and Doctor of Engineering from Nanyang Technological University. He is also an adjunct professor at the NUS Faculty of Engineering.

Er. Tan has established a distinguished career in the area of environmental and water management, beginning as an engineer in the former Public Works Department and

culminating with the doyen positions of Permanent Secretary of the former Ministry of the Environment and Chairman of the Public Utilities Board.

Er. Tan has made immense contributions to Singapore in ensuring the sustainability of its water supply.

Firstly, he was responsible for drawing up the master plan for the clean-up of the Singapore River and chaired the inter-agency committee in this massive effort. The impact of this significant project is still felt today as it brought about the redevelopment and modernisation of much of Singapore and paved the way for the development of the Marina Barrage.

Secondly, he also led the diversification of Singapore's water sources to form the Four National Taps, a long-term water supply strategy to meet Singapore's needs for generations to come.

Thirdly, Er. Tan was also instrumental in overseeing the development of NEWater, Singapore's own brand of recycled water.

Finally, he was behind the introduction of Singapore's first desalination plant at Tuas by PUB, as well as the expansion of the water catchment area from half to two-thirds of Singapore's land area, thereby boosting the supply of local catchment water.

Er. Tan generously shares his expertise and experience in environmental and water management by serving on several advisory panels, including the Environment and Water Technologies International Advisory Panel (EWT-IAP) and the Institute of Water Policy at the National University of Singapore.

Beyond the environmental and water sector, Er. Tan had played a substantial role in his capacity as a member of the Presidential Council for Religious Harmony. He is also a member of the Advisory Panel of the Centre for Liveable Cities, among many others.

In recognition of his outstanding contributions, Er. Tan has been conferred numerous awards. He has received awards at the national level, such as the Public Administration (Silver) Medal, the Meritorious Service Medal and the highly-coveted Distinguished Service Order. He has also received the President's Award for the Environment, the NTUC Medal of Commendation, a Special Award for Clean River Commemoration and the NUS Distinguished Engineering Alumni Award. Er. Tan is also an Honorary Fellow of IES, which is the highest

honour bestowed by the Institution to recognise individuals who have made tremendous contributions in engineering to the nation. More recently, Er. Tan is elected a Fellow of the Academy of Engineering, Singapore in 2012, as well as the NUS Society Distinguished and Outstanding Member Award in 2014.

Under his stewardship, he also led PUB to win the Stockholm Industry Water Award, one of the highest accolades for outstanding achievements in the global water arena.

Er. Tan has dedicated his life to developing and advancing an efficient water management system for Singapore. Throughout his career, he has demonstrated a visionary zeal in pursuing the enhancement of Singapore's environment to improve the quality of life for its residents.

He is an outstanding role model for engineers everywhere.

In recognition of an outstanding engineering leader whose lifetime accomplishments have made profound impact in the engineering industry and community; and who has brought international honours to Singapore, the IES Council hereby award Er. Tan Gee Paw with the Lifetime Engineering Achievement Award 2015.

<u>IES Prestigious Engineering Achievement Award 2015 – Citations</u>

1. Current Blockage in Offshore Engineering – Morison Revised on the 65th Anniversary of the Famous Equation

By: National University of Singapore & University of Oxford

Wave-current blockage predicts lower hydrodynamic forces on space-frame offshore structures in severe storms than the 65 year old industry standard practice. We have novel analytical and numerical modelling for this blockage effect which is supported by considerable experimental evidence.

This better force prediction will be important for more efficient new-built compliant towers and jackets, as well as for structural integrity management of existing aged structures.

2. Innovative Hybrid Membrane Dehumidifier (MD)-Indirect Evaporative Cooling (IEC) System For All-Weather Airconditioning Without Compressors

By: National University of Singapore & King Abdullah University of Science & Technology A game-changing air conditioning technology that improves building energy efficiency, reduces carbon emission, and produces better indoor air quality.

An innovative cooling technology that reduces Singapore's energy consumption to provide comfort air conditioning.
A disruptive cooling technology for all weather application and one that provides sustainable air conditioning - a significant global impact since Carrier invented the mechanical cooling system in the year 1902.

3. M-Kool Never Sweating Again!

By: A*STAR, Institute of Materials Research and Engineering & National Univiersity of Singapore

M-KOOL is an energy-free passive-cooling technology based on nanostructured phase change material (PCM) that is 3 times more thermal conductive and 30% more heat dissipative than conventional PCM materials, suitable for smart wearables and energyefficient green building applications, such as concrete, paints and window shadings. M-KOOL combines the effect of both heat absorptive phase change material and heat conductive nanomaterials, to provide effective thermal management for cooler fabrics and buildings, by reducing solar heat gain into tropical indoor space and air-con cooling loads.

4. AGAR (Angle closure Glaucoma Risk assessment system)

By: A*STAR, Institute for Infocomm Research, Singapore Eye Research Institute and Singapore National Eye Centre

The intelligent AGAR system automatically processes and analyse anterior segment optical coherence tomography images to classify the glaucoma subtype.
The system was developed by an inter-disciplinary team of computer scientists and engineers from the Institute for Infocomm Research (I2R), A*STAR and clinician-scientists from the Singapore Eye Research Institute (SERI) and Singapore National Eye Centre (SNEC). AGAR will potentially enable cost-effective eye-screening for glaucoma detection.

5. Towards Better Living and Greater Sustainability through "Smart Planning"- Urban Environmental Modelling (UEM)

By: Building Research Institute, Housing & Development Board

Smart Planning aims to help planners improve living comfort of residents and achieving sustainability goals set for towns. Through extensive research, HDB developed the Urban Environmental Modelling (UEM) technique to allow planners, architects and engineers better understand how urban forms interface with nature and how planning and design can be optimised to enhance the living environment.
It allows planners to simulate the development plans on a "Virtual Platform", architects and engineers to use the results to develop upstream measures to improve human comfort,

enhance environmental qualities to achieve a sustainable and highly liveable residential town.

6. Jurong Rock Caverns

By: JTC Corporation

Jurong Rock Caverns (JRC) is located on Jurong Island and is South-east Asia's first commercial underground facility for the storage of liquid hydrocarbons such as crude oil and condensate.

JRC is located 150 metres below the ground and 130 metres below the seabed, making it the deepest known underground public works endeavour in Singapore to date. With its successful completion, JTC and Singapore is well positioned to explore more innovative solutions to further promote Singapore's economic growth.

7. Speak to Me in My Language

By: A*STAR, Institute for Infocomm Research

'Speak to Me in My Language' aims to develop and deploy machine translation technology to break down the language barriers for the text and voice communications among Southeast Asian languages. The technology represents state-of-the-art translation performance in US National Institute of Standards and Technology international evaluation. The technology has been adopted locally and internationally by leading internet companies.

8. ABSolution: Advanced Software Package for Nanometer Spaced Head-Disk Interface Design and Simulation

By: A*STAR, Data Storage institute

The project done by the team from Data Storage Institute, A*Star, focuses on developing simulation models and tools to unravel mechanisms of nanometer-spaced air bearing and tribological interface systems. An advanced software package, ABSolution, has been developed that integrates various simulation models including air bearing model, heat transfer model, thermal-structural model, etc., and implements the high efficiency coupledfield algorithms to study the tribological issues of the nanometer spaced head-disk interfaces.

The software has been licensed to hard disk drive industry for design and simulations of air bearing sliders for current perpendicular magnetic recording and future heat-assisted magnetic recording

9. Samwoh Eco-Green Building – First Building in the Region

By: Samwoh Corporation Pte. Ltd

Samwoh Eco-Green Building is the first in the region to be constructed with up to 100% recycled concrete aggregate (RCA), which is derived from the construction & demolition waste.
Extensive laboratory testing has been conducted to evaluate the performance of RCA concrete and the findings have been published in two renowned journals, namely, American Society of Civil Engineers and Magazine of Concrete Research from UK.
The completion of this building has marked a breakthrough in concrete technology and paved the way towards greater sustainability.

10. The Future of Audit: Predictive Analytics on Irregularities and Risks in Bank Branches

By: A*STAR, Institute for Infocomm Research and Group Audit, DBS Bank Ltd

DBS-I2R Joint Lab has developed a Data Analytics based solution for Predictive Auditing. This is a data driven and learning risk surveillance model which analyses heterogeneous data to detect and predict risk events.
The solution enables 1) the bank to establish preventive controls before these risks escalate; and 2) a laser-sharp focus on their areas of review. Consequently, this will lead to an overall up-tiering of the internal control environment of the bank and increase customer confidence in the integrity of the financial industry.

11. National Maritime Security System - National Security And Advanced Capabilities Through Technology

By: Defence Science & Technology Agency (DSTA)

The National Maritime Security System is a first-of-its-kind capability that provides automated data fusion, information sharing and collaboration across government agencies to enhance the security of Singapore's waters.

12. Design and Development of an Intelligent Quad-rotor Unmanned Aerial Vehicle

By: School of Electrical and Electronic Engineering, College of Engineering, Nanyang Technological University

An Intelligent Quad-rotor which is capable of performing various missions such as passing through air vent, manoeuvre in tight corridor and releasing a 50g payload. It has salient features such as Automatic Throttle Control System, Chain Curtain Guiding Mechanism, First-Person View Cameras And Automatic Payload Release System to ease the workload of the pilot and increase its capabilities and performances.

13. Self-Powered Hybrid Cell with Enhanced Photocatalytic Functionalities For Hydrogen Production And Waste Water Treatment

By: Engineering Science Programme, National University of Singapore

This work demonstrates an innovative and contemporary multiple-renewable solar and vibrational energy powered catalysis system. It involves multifunctional nanomaterial innovation with water purification and hydrogen generation capabilities. The self-powered system offers a sustainable solution to both urban and rural societies in providing clean water and energy resources.