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JULY 2022

The Government's Role in Transportation Project Management

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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

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CEO/PUBLISHER
PATRICK LEUNG

GENERAL MANAGER
SHIRLEY THAM • *shirley@dimensionpublishing.com*

HEAD OF MARKETING & BUSINESS DEVELOPMENT
JOSEPH HOW • *joseph@dimensionpublishing.com*

PRODUCTION EDITOR
TAN BEE HONG • *bee@dimensionpublishing.com*

CONTRIBUTING WRITERS
PUTRI ZANINA • *putri@dimensionpublishing.com*
HANNA SHEIKH MOKHTAR • *hanna@dimensionpublishing.com*

SENIOR GRAPHIC DESIGNER
SOFIA HANIS • *sofia@dimensionpublishing.com*

GRAPHIC DESIGNER
NICOLE THENG • *nicole@dimensionpublishing.com*

ADVERTISING CONSULTANTS
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by Ir. Dr Nor Azhar bin Mohd Arif
Chairman, Project Management Technical Division (PMTD)

COVER NOTE

Transportation Project Management

The COVID-19 pandemic has impacted all major industries, including the transportation sector. During the Movement Control Order (MCO), transportation operators and businesses shifted their focus from moving people to keeping a core transportation system operational with a skeleton workforce to ensure freight and key essential workers could continue to move. But many experienced an unexpected shortfall in finances due to the impact on their sources of revenue.

Although plans had been made to ensure the transportation network was ready for normal operations when the MCO was lifted and borders reopened, the pre-pandemic volume and frequency of commuters and travellers had yet to be reached.

This month, *JURUTERA* looks into the importance of project management by both the government and private entities in the transportation sector. The cover story features Transport Minister Y.B. Datuk Seri Ir. Dr Wee Ka Siong, who says good project management will plan for the on-time delivery of a project from the start of the project cycle and ensure a contingency plan is in place in case of any deviation or problem arising.

The 2 other feature articles, Adopting Project Management Front-End Engineering in the Development of PETRONAS Floating LNG (PFLNG) and Ring-Fencing the Transportation Project from Covid-19 Insurgence Using Project Communications Management Practice Through Building Information Modelling, should also provide a good read to all. ■

EDITOR'S NOTE

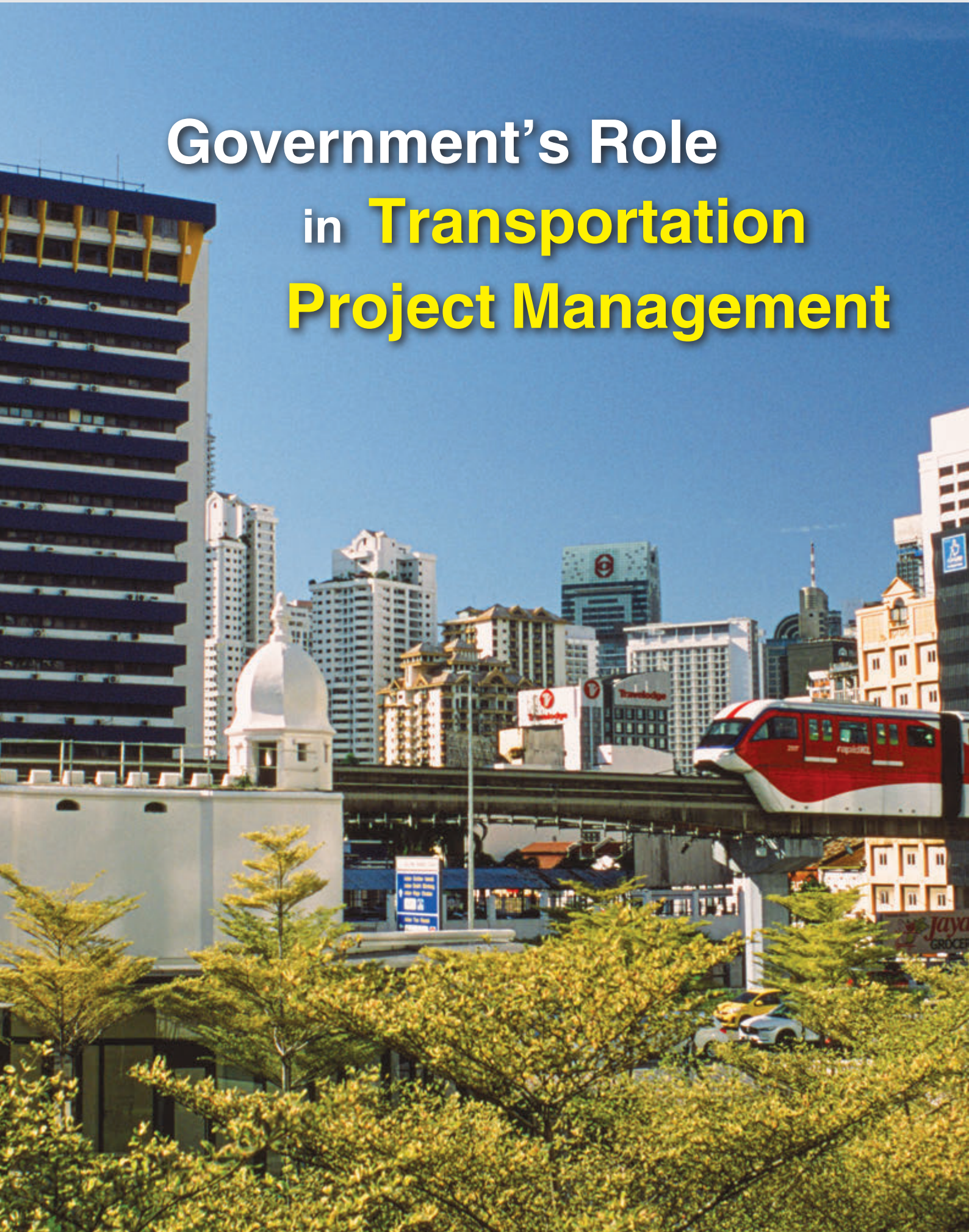
Failing to Manage is Managing to Fail?

The phrase may not rhyme perfectly but I believe you get the point. Project management is an essential skill that engineers need to have. Regardless of the size of the project, the process of getting it done within a specific time and budget requires the application of such a skill, whether subconsciously or intently.

by Ir. Dr Siow Chun Lim
Principal Bulletin Editor

In this July issue of *JURUTERA*, the Project Management Technical Division team has managed to touch base with the Minister of Transport, Datuk Seri Ir. Dr Wee Ka Siong, who has been a member of IEM since 1999, to gain greater insights into the role of the government in managing transportation projects. In addition, there are also a few other articles on project management lined up for your consumption. Happy reading! ■

Government's Role in Transportation Project Management



The IEM Project Management Technical Division (PMTD) team, led by its Chairman Ir. Dr Nor Azhar Mohd Arif, meets the Minister of Transport, Y.B. Datuk Seri Ir. Dr Wee Ka Siong, to find out more about the management of transportation projects by the Government.

The scope of national transportation projects covers land, aviation, maritime and logistics. The management of these projects falls under the ambit of the Ministry of Transport (MOT), which is guided by the principle of "moving people and goods safely, efficiently and sustainably across Malaysia to improve quality of life and support a competitive economy".

MOT governs the overall development of infrastructure for the four sectors, formulates and implements policies as well as addresses issues of safety and security through the relevant agencies. It also oversees the implementation of various interventions and initiatives, manages logistical resources throughout the supply chain and facilitates services by transport business entrepreneurs and operators, including matters concerning licences, taxes and permits.

As the Ministry responsible for the management of the country's transportation infrastructure projects, MOT is involved in various project management components, such as planning, designing, execution, monitoring, testing and project closure. Highly technical, all projects are linked to maintaining the continuing operation of the infrastructure, from directing infrastructure projects to defining tasks and timelines, co-ordinating across various parties involved in the projects, managing national budgets for the government transportation projects and ensuring timely delivery.

Development Priorities

With so many factors involved in managing the government's transportation projects, prioritisation becomes crucial. According to Datuk Seri Ir. Dr Wee, ensuring safety tops the government's order of priorities for transportation projects.

> "Safety is of utmost importance in terms of priority as no other element can override the safety criteria. Our priority will be projects that need rehabilitation or upgrading because these are due for maintenance and we will not allow them to reach a stage that's beyond economic repair."

Next in the line of priorities is the cost factor. Datuk Seri Ir. Dr Wee says the Government needs to keep the budget feasible and not waste public funds.

> We also need to look into the outcome of projects, such as whether they will bring mass benefits to the public. We will also consider the views of other stakeholders, such as State Governments, the Economic Planning Unit of the Prime Minister's Department and the Treasury, to obtain their inputs on projects.

National Transport Policy

Sitting at the top echelon of project stakeholders, above project consultants, contractors and the public at large, MOT carries a heavy responsibility to ensure that the various parties involved in Government's transportation projects can implement policies and directives of the Government. In this respect, Datuk Seri Ir. Dr Wee stresses that MOT is guided by the first National Transport Policy (NTP 2019-2030), which was launched in 2019.

"NTP forms our guidelines and policies and MOT needs to adhere to it strictly to ensure that projects carried out are in line with strategies outlined in the NTP. Besides that, the Treasury issues circulars from time to time to remind each ministry to ensure that project implementation is done properly in terms of budget and work progress," he says.

NTP serves as the overarching roadmap for developing an efficient, comprehensive, secure and sustainable transport sector aimed at enhancing Malaysia's economic competitiveness and supporting the people's well-being. Developed through close collaboration between the Government and the private sector, NTP 2019-2030 consists of five policy thrusts and 23 strategies, taking into consideration future trends that will affect the transport sector. The five policy thrusts aim to strengthen governance to create a conducive environment for the transport sector, to optimise, build and maintain transport infrastructure, services and networks for efficiency, to enhance safety, integration, connectivity and accessibility for a seamless journey, to advance towards a green transport ecosystem and to expand global footprint and promote internationalisation of transport services.

In addition, the formulation of NTP 2019-2030 addresses several key trends and issues, such as the growing and increasingly ageing population, increasing urbanisation, advances in real time information and digitalisation, expansion of e-commerce market, shifting towards environmentally sustainable transport, moving towards bigger vessels, consolidation and containerisation, increasing passenger travel and impact of

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BUILDING TRUST

Datuk Seri Ir. Dr Wee Ka Siong talking to IEM-PMTD representatives about transportation project management

IEM-PMTD representatives (L-R): Ir. Wan Rizaluddin Abdullah Wan Ali (Committee Member), Ir. Dr Harris Abd Rahman Sabri (Deputy Chairman), Ir. Dr Nor Azhar Mohd Arif (Chairman), Ir. Assoc. Prof Dr Syuhaida Ismail (Secretary/Treasurer) and Mr. Chitdrakantan Subramaniam (Committee Member) at the presentation of a token of appreciation to Minister of Transport Datuk Seri Ir. Dr Wee Ka Siong

low-cost carriers as well as the proliferation of new technology.

The framework of NTP will also be the guiding principle for future investments in the various transportation systems to ensure Malaysia remains a business-friendly country in order to fulfill the needs of the industry. It will also focus on reviewing various acts and regulations to improve logistics connectivity in line with the e-commerce boom as well as on the continuous upgrading of ports and expansion plans. The ultimate objective is to enhance productivity and increase competitiveness for the transportation sector in creating a robust regulatory framework that supports the future needs of the industry.

Effective Project Management

In ensuring the successful execution and completion of projects, Datuk Seri Ir. Dr Wee says MOT has a comprehensive set of monitoring policies and procedures for each project.

"For example, we hold progress review meetings monthly, make site visits and review budgets etc. so that we can monitor the progress of each project accordingly and take remedial actions swiftly should we note any untoward circumstances or variances. In fact, under the circular of Arahan No. 1 2022 – Mekanisme Penyelarasan Pelaksanaan Pembangunan Negara (National Development Implementation Coordination Mechanism), it is my responsibility as Minister, to chair the monthly Development Action Council meeting to ensure all projects are executed according to plan," says Datuk Seri Ir. Dr Wee.

He explains that effective project management is essential for the successful implementation of transportation projects. The elements of good project management are embedded in the earlier mentioned monitoring and review policies and procedures.

Datuk Seri Ir. Dr Wee says: "Good project management will plan, right from the start, for the on-time delivery of the project and to ensure there is a contingency plan in place if there is any deviation or problem arising during the project implementation period. For MOT, the planning part is the most important phase since it provides the structure and foresight for the execution stage. The need to ensure project scope and specification is done meticulously. This is important to ensure the smooth execution of the project."

In managing the various transportation projects under NTP 2019-2030, MOT faces many critical challenges and Datuk Seri Ir. Dr Wee singles out public perception as MOT's greatest challenge.

"Public perception is our greatest challenge as major projects come under intense public scrutiny; we need to maintain greater transparency to safeguard public interest and uphold the people's trust

in MOT," he says, adding that another big challenge is the large capital expenditure involved in public transportation projects. Therefore, MOT needs to plan and identify priorities when it comes to new infrastructure projects," he says.

Competency Certification

As for appointing project managers to handle government projects, the government has recently imposed a requirement for project managers to have the Certified Construction Project Manager (CCPM) certification issued by the Construction Industry Development Board (CIDB). However, Datuk Seri Ir. Dr Wee is of the view that this policy will not guarantee better quality project managers.

He explains: "It all depends on how the management personnel are trained and the kind of exposure that they've had. Big organisations have the process in every step involved. If an engineer has gone through each process, he will have the necessary exposure. Whether you are certified or not will not guarantee better quality, but having gone through the process will definitely mean getting the needed exposure. Of course, the authorities want to come up with a competency certification to show that an engineer has gone through the training and process. In general, however, you must still provide a better and more conducive environment to train more people."

Although there is no guarantee that this measure will ensure projects are delivered on time and as per design, the certification is still a good step towards ensuring better deliverables. Ultimately, knowledge acquired by project managers largely depends on the depth and intensity of training they have been given.

Building Local Talents

Datuk Seri Ir. Dr Wee feels it is very important to train and build local talents. He says: "We have to build up local talents to manage and, of course, get external consultants to advise where needed. But eventually technology transfer and the transfer of know-how from the external consultants to local talents must happen. These consultants must impart the knowledge to Malaysians who must learn and pick up. That is very important."

He is of the opinion that Malaysia still lacks engineers and points at the failure to implement Science, Technology, Engineering & Mathematics (STEM) education. Instead of training students in one particular domain, STEM education should rightly combine all 4 domains in an inter-disciplinary and applied approach so as to better equip students for a career related to STEM. In addition, STEM education must consider real-world applications.

"To be frank, STEM has not been successfully implemented. There are many graduates but they don't have the STEM education that meets market demands. All construction sites, plants and manufacturing companies are facing the problem. They cannot find local workers and become too dependent on foreign workers whose productivity may not be as high as qualified locals. So more locals must be trained properly and their skills upgraded. The Human Resource Development Fund (HRDF)

for training must be utilised spot-on in the fields that the industry wants. Now there is no correlation between training given and the actual market demand," he laments, adding that the government must study this aspect so that Malaysia will have more students taking up STEM and engineering courses.

Datuk Seri Ir. Dr Wee says an engineering education is good and all engineers must have the basic training.

> Engineers are taught to be very strict and to follow rules. They cannot bend the rules. For example, design criteria cannot compromise on safety. The engineers' decision is crucial. Safety comes first. For instance, if an aeronautical engineer says a plane cannot fly, it means it just cannot take off even though grounding a faulty plane will cause delay. So what? Safety comes first.

There are challenges to managing big projects and MOT wants local talents and to build local capacity. Datuk Seri Ir. Dr Wee cites Petronas as an example.

"Just look at how Petronas manages its business services. Initially, they may get guidance from someone else (external expertise) but eventually the local employees learn to do the job. It is like localisation has taken place. Even the initial stage of the rail sector relied on the expertise of the Original Equipment Manufacturer or OEM. It is important that after the OEM has supplied the sets, we must think of ways to localise. For maintenance, repair and operations (MRO), we must start with very basic MRO, from level one to four and then gradually transfer the skills to a local company," says Datuk Seri Ir. Dr Wee, adding that the rail sector has embarked on human capital development of local talents through the establishment of the National Rail Centre of Excellence (NRCOE).

NRCOE, which comes under MOT, provides a centralised platform for the implementation of the Human Capital Development (HCD) Programme, Rail Industry Development Programme (RIDP), Testing and Certification (T&C) and Research and Technology (R&T). It also aims to become the facilitator for rail industry development in Malaysia, a hub for international and local industry players to interact and to provide professional advice on the rail industry.

Datuk Seri Ir. Dr Wee says: "We must make sure we can produce enough people and train more people for this sector."

One current concern is the airline industry which is picking up after the Covid-19 pandemic hit the world about two years ago. Datuk Seri Ir. Dr Wee says the government needs to revive the aviation industry and rebuild air connections.

"This is very important because aviation will enable the movement of goods, investments and people. Without such movement, the economy cannot grow," he says, stressing that helping to push economic growth remains one of the ultimate objectives of the government.

He concludes by inviting representatives of IEM PMTD to join MOT in its study tours and technical visits, including visiting the Genting Tunnel which is currently under construction, the East Coast Rail Link (ECRL) project and port projects. He has also invited PMTD to attend the launch of Mass Rapid Transit 2 (MRT2), which is a part of the Putrajaya line. Such collaborations with MOT will expose IEM PMTD members to the state of current developments of projects under the management of MOT. ■

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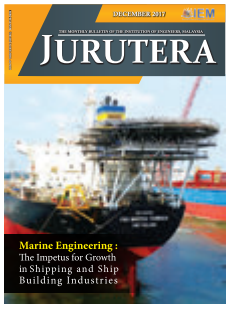

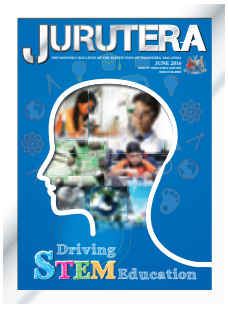

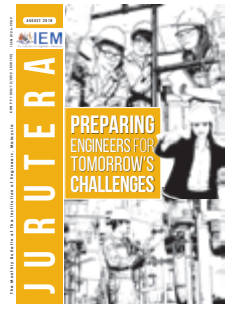

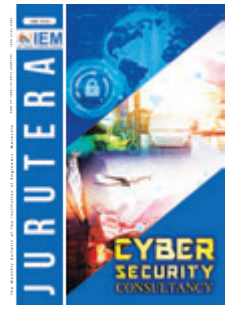

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Adopting Project Management Front-End Engineering in Development of PETRONAS Floating LNG (PFLNG)

Written and Prepared by:

Ir. Ts. Wan Mohd Ikhwan bin Wan Yussoff

A Staff Engineer in Front-End Engineering at PETRONAS MPM, Resource Development & Management (RDM) Division, with more than 18 years' work experience in overall project management activities.

Ir. Wan Rizaluddin Abdullah bin Wan Ali

A Staff Engineer in Planning & Scheduling at PETRONAS MPM, Resource Development & Management (RDM) Division, with more than 23 years' work experience in project management.

A floating liquified natural gas (FLNG) facility is a floating production storage and offloading unit that conducts liquified natural gas (LNG) operations for developing offshore natural gas resources. Floating above an offshore natural gas field, the FLNG facility produces, liquefies, stores and transfers LNG at sea before it is shipped directly to markets.

As part of Oil & Gas project management elements, Front-End Engineering (FEE) or Front-End Engineering Design (FEED) is defined as an early engineering design activity to realise a project via good planning prior to concluding the project Final Investment Decision (FID). It is also referred to as front-end loading (FEL), pre-project planning (PPP), feasibility study (FS) or early project planning. FEED is a basic engineering activity conducted right after conceptual design or project feasibility study. In other words, FEED is an engineering design approach executed prior to embarking on project Engineering, Procurement, Construction and Commissioning (EPCIC) phases.

This is an important phase, designed to control the project execution plan and project related expenses prior to receiving bid submissions. On average, FEED takes up roughly 2% of the overall project cost. The benefit of a timely and solid executed FEED phase can potentially save up to 30% of overall project costs in the subsequent project phases.

During project plan development, identification and analysis of project requirements via project framing exercise are conducted to establish the optimum business case – this activity is called Opportunity Project Framing (OPF).

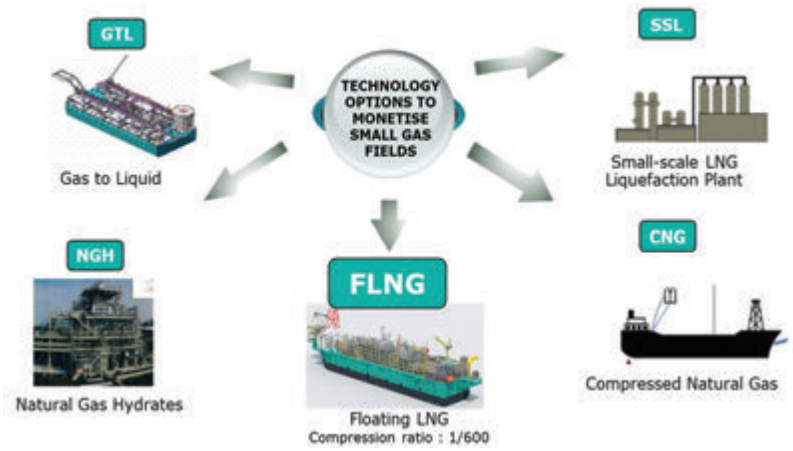
During this project stage, the PETRONAS FLNG concept was identified to monetise stranded gas resources in Malaysia. PETRONAS also explored the development of Floating Compressed Natural Gas (FCNG) and Floating Gas to Liquids (FGTL) as part of "Technology Challenge Initiatives". In completing the elements in the overall LNG

value chain, a Floating Storage Regasification Unit (FSRU) was identified as a fast-track solution to make available LNG, especially to non-LNG producing countries.

The above information is registered in a document called a Project Charter or the process of developing a document that authorises the existence of a project and provides the project manager with the mandate and formal authority to apply organisational resources to project activities. The contents of the Project Charter include project overview, project scope, project high level cost, project timeline, preliminary project economics, and project key deliverables.

FLNG Project Scoping & Planning

As part of the Project Scoping and Planning, understanding the overall FLNG value chain is very important. For example, the traditional method of producing natural gas is by having an onshore facility. Normally, LNG is produced via an onshore LNG plant where the natural gas is piped from gas fields located in the ocean. Similarly for the onshore regasification plant to convert offshore LNG into natural gas before it is exported to end consumers via a gas grid. In terms of the conceptual design and size optimisation, these facilities must suit perfectly with certain feedstock or reserves in order to be economical. For example, a FLNG shall be designed to monetise gas fields with minimum reserves of between 1 trillion cubic feet (TCF) to 3 trillion cubic feet (TCF).



It is understood that gas fields of such capacities are available in reasonable quantities globally. This has led to the motivation for front-end studies to look for solutions in monetising them. Distance to shore is one of the elements in the evaluation between shore-based LNG plants vs onshore LNG plants. On another note, there are lots of stranded gas fields in deeper waters, where building a mobile/relocatable FLNG may be a more attractive and economically viable option. An important project management activity is Concept Identification (CID) and Concept Select (CS). This is the project stage where other potential facility concepts are also evaluated, in this case FCNG and FGTL.

FLNG Project Facilities Design

In Project Facilities Design, there are similarities in terms of the need for the production facility, storage, transfer systems and transportation. Floating facilities are believed to become a game changer in the future, overtaking the development of conventional wellhead platforms (WHP) and Central

Processing platforms (CPP). Very often, conventional facilities are lacking in terms of product storage which requires the product to be sent to shore via pipelines. Floating facilities are constructed of many types, with the most common being ship-shaped or defined as Floating Production, Storage & Offloading (FPSO).

FLNG is defined as water-based LNG operations employing technologies designed to convert natural gas into LNG, which enables the development of natural gas resources located in stranded or remote areas. As the first FLNG operator in the world, PETRONAS operated its first FLNG in 2016. The vessel was towed from a shipyard in South Korea to Kanowit Field in Sarawak waters. Floating nearby to an offshore natural gas field, the FLNG facility theoretically produces, liquefies, stores and transfers LNG at sea before it's transported by ship directly to global markets.

FLNG Project Risk Assessment and HSSE

Changing the LNG production from a conventional onshore to an offshore environment introduces a demanding set of challenges for the project team. In terms of the design and construction of the FLNG facility, every element of a conventional LNG facility needs to fit into a smaller area footprint while adhering to appropriate levels of safety and providing some flexibility in producing LNG. Every aspect, including the robustness of the processing equipment, is taken into consideration to suit the offshore marine environment. Most of the equipment used are normally well proven for an onshore environment but are later adapted to suit site-specific metaocean conditions.

As part of Project Risk Identification & Control, development of risk management plan and the process by which risk identification and quantification will be evaluated. Therefore, it is understood that an offshore plant must be compact, lightweight and designed with a certain level of inherent process safety due to the limited deck space. Considering the dynamic motion of the vessel, another important requirement to be considered is that the units must have a stable and robust operation in a marine environment.

Below are the main comparisons between onshore and offshore LNG plants:

Criteria	Onshore	Offshore
CAPEX (excluding upstream development)	Extra cost for land, pipeline, jetties, infrastructure	One facility at source location and direct shipping to buyers
EIA and Permitting	Longer process and potential to have area limitations	Simpler and easier process expected for offshore locations
Installation and Abandonment	Permanent installation	Relocatable offshore floating units
Screening of Locations	Limitations on suitability of seafronts, water depth etc.	Can be located at gas source even if at remote area
Homeland Security	Close to the population	Lower risk, less exposure to public

In addition, on HSE Planning, PMT must ensure compliance to stakeholders HSE and HSE regulations throughout all phases of the project. The plant located on a floating facility should be able to operate under a variety of process conditions and possess a high degree of inherent process robustness. In developing and constructing a floating plant, some key technical requirements must be considered. Major pieces of equipment such as compressors, gas expanders, gas turbine/generators, heat exchangers, columns and separators should be able to withstand offshore environment conditions.

One key information required is the site-specific metocean data because when a facility is in operation, sea state conditions will introduce another major challenge especially during product transfer and storage capability. Specific to FLNG and FSRU, the LNG cargo containment systems should be designed to be capable of withstanding any potential damage that may occur due to the sloshing effect in partially-filled tanks. Therefore, data on wind, waves and currents in the open seas are critical inputs towards the design of the containment systems.

In terms of design life, floating facilities are normally designed and constructed to operate for a minimum of 20 years without dry-docking. This means the structure and

containment system of the vessel are designed for a service life of 20 years. A planned life-cycle of a minimum 20 years often provides a good economy of scale.

As a result, for the Petronas FLNG development, solutions to reduce the effect of motion and weather were addressed very early in the design, allowing the floater to withstand and even reduce the impact of waves. This concern led to the decision to choose the right cargo containment system. A few rounds of model test and wind tunnel tests were carried out to simulate real FLNG operations. In this area, technological development had been mainly evolutionary rather than revolutionary, leveraging on and adapting technologies that were currently applied to offshore oil production or onshore liquefaction.

FLNG Technology Evaluation, Regulatory & Permitting Requirements

Multiple key technology evaluation was done with regards to the choice of transfer system. For example, traditional LNG loading arms were adopted to enable LNG transfers in the open water. The hose-based solutions for side-by-side transfers were also considered; however the technology maturity for the system was not available during the engineering phase. Today, the application of cryogenic hose may be the preferred way of transferring the LNG due to its flexibility and robustness.

Throughout the development of Petronas FLNG, there were many critical regulatory approvals that had to be obtained from the local authorities and relevant bodies. Most of the requirements focused on the HSE aspects of the development and the new facilities to be developed which had to be environmentally friendly. For example, the Department of Occupational Safety & Health (DOSH) which resided under the Ministry of Human Resource, was responsible for providing Permit to Install (PTI) and Permit to Operate (PTO) of the Petronas FLNG flexible riser. Upon receiving the PTI, the project team provided the approved pressure test, witnessed by the DOSH officer. For the PTO, the Emergency Response Plan (ERP) had to be approved by DOSH. Another example would be the PFLNG1 helideck which had to be approved by the Department of Civil Aviation (DCA) after a physical inspection.

Classification Society also played a significant role in the PFLNG1 regulatory approval processes. The Marine Department Malaysia was the body that ensured the facility followed relevant international maritime standards. PFLNG1 engaged Classification Society from the start of the project. PFLNG1 received an Approval in Principle (AiP) in 2012 from the classification body to confirm that the overall design was technically acceptable, without any showstoppers.

Below are the key design criteria in designing a floating facility:

Design criteria	Remarks
Inherent safety design	To meet the design margin
Production capacity and field development strategy	Built to capacity
Process robustness, efficiency and reliability	To withstand the site-specific conditions
Proven operational experience on onshore plant	Equipments marinisation to suit marine application
Research and development on marinisation	To gauge the limitation of applications
Sea state conditions (stability and structural integrity)	To design based on site specific data

The floating facilities shall be designed to support the production, provide storage for the inventory of the product and later to allow product transfer. For example, FLNG is equipped with mooring and offloading for export to LNG carriers and condensate tankers. Product offload will be side-by-side configuration for LNG off-take while in tandem configurations for condensate off-take.

Cargo containment systems for FLNG and FSRU can be the same as long as the design has considered the capability to handle sloshing effects. For CNG, there are many types of tanks available to hold natural gas at pressures up to 3,600 PSI. However, specific requirements for FCNG such as minimum weight and compact design will be the key selection criteria for tank selection. For FGTL, a normal condensate tank is suitable as long as it is not mixed with the crude oil because GTL property is a lot cleaner than crude oil.

The Acid Gas Removal Unit (AGRU) is designed to remove CO2 and H2S from the feed gas to meet required product specification. AGRU designs are available from many types and licensors. All the floating facilities, except FSRU, require AGRU as part of the system and to be installed at the topside, based on the condition of the feed gas.

PFLNG1 technology screening processes prior to receiving AiP during FEED

All living quarters are usually located at the aft and the helicopter deck will be arranged above the living quarters. Living quarters are designed to house the minimum numbers of personnel required to operate both the marine system and process system located at the topside. Sometimes, it is also designed to provide more space, considering additional requirements during shutdown.

Mooring systems are designed to fit the extreme condition based on the environmental data at site location. The turret or spread mooring system is designed to keep the facility anchored properly to the seabed at all times during the operation phase. For example, a turret mooring system is designed to allow the floaters to freely weathervane around the mooring axis under the action of wind, waves and current as well as to accommodate roll, pitch and heave motions of the floater.

The LNG offloading system is often selected based on the latest development and available technology, taking into account possible operations limitation due to environmental conditions. For example, the selection of the offloading system at the FLNG is very much determined by the LNG carrier (LNGC) offloading acceptance i.e. offloading design conditions.

Conclusion

Front-End Engineering remains one of the key elements in overall Project Management activities. It helps the project owner to appropriately chart the successful way forward and to identify necessary mitigation actions on risks associated with the early stage of the project design. FLNG is a great solution because all processing activities are done at the gas field and there is no need to lay long pipelines all the way to shore. This significantly reduces the environmental footprint and helps to preserve marine and coastal environments.

FLNG is breakthrough technology, a game changer which requires bold decisions in becoming the pioneer in industry. PETRONAS has moved to another level of having huge aspirations in becoming a niche player in the FLNG arena. FLNG signifies technology advancement solution which adds value to marginal and stranded offshore gas resources which will otherwise not be economical to develop via onshore LNG method. The FLNG becomes dominant as it has the capacity for relocating to other gas fields. The mooring chain can be disconnected and the facility can be towed to a new location, minus the complicated abandonment works required for conventional fixed structures. ■

Ring-Fencing Transportation Projects from Covid-19 Insurgence Using Project Communications Management Practice

Written and Prepared by:

Chitdrakantan Subramaniam

A committee member of the Project Management Technical Division (PMTD). He has been involved in project management and policy making related tasks in various ministries.

Nur Syafika Artika Rahim

A sub-committee member of PMTD. She is a Project Manager at Property & Land Development, Damansara Holding Bhd. Malaysia.

Ir. Assoc. Prof. Dr Syuhaida Ismail

Secretary/Teasurer of PMTD. She has published more than 300 articles on project and construction management.

Rahidah binti Mohd

Deputy Undersecretary at the Ministry of Transport, is involved in the planning and monitoring of transportation projects for land, sea and air.

The COVID-19 pandemic has disrupted economic activities worldwide. On February 11, 2020, the World Health Organisation (WHO) declared the start of an unexplained black swan occurrence that was close to the post-World War II economic scene; it was formally referred to as COVID-19. The pandemic spread globally and it also affected the construction industry, including transportation projects (Nicola *et al.,* 2020). Some operations were completely halted due to a near-zero level of human engagement.

As the virus was highly infectious, all construction workers, categorically in transportation projects, were extremely vulnerable considering the nature of their work, which required teamwork and regular communication. As a result, the Ministry of Health (MOH) Malaysia and the National Security Council (NSC) issued an advisory warning to immediately shut down construction sites due to potential health concerns. The action had an adverse effect on the construction industry, especially transportation projects. Even after the Movement Control Order (MCO) was lifted, the construction industry, especially transportation projects, continued to encounter disruptions such as stringent Standard Operating Procedures (SOPs) and shortage of manpower due to border shutdown. The transportation industry faced a lot of challenges as the country experienced an economic downturn post-pandemic which affected the construction industry.

These included communications management issues due to restricted working hours, social distancing requirements, communications breakdown and implementation of the "work from home" strategy. The construction industry, notably transportation projects, is always prone to project stakeholder miscommunication, often leading to disputes, causing cost overruns and project delays. Furthermore, poor communication may lead to delays in the flow of information and unclear project direction, resulting in confusion and wrong interpretation by project stakeholders. According to the Project Management Institute (PMI), most projects experience cost overrun due to ineffective communication and improper time management for project communication management plan (PMI, 2017).

Transportation projects often involve multiple stakeholders such as the government, consultants, contractors, related authorities and land developers if the project involves Transit-Oriented Development (TOD).

This shows the importance of an efficient and productive stakeholders' communication plan to achieve successful project delivery. Ineffective communications is attributed to the lack of a shared language among team members, workplace tension, attitude of superiors and subordinates toward site workers, misinterpretation of orders and poor communication skills among employees. For this reason, to overcome the potential information flow breakdown during the pandemic, the Malaysian construction industry, especially transportation projects, will undoubtedly require a comprehensive project communications management approach. Moreover, better project communications management can result in innovations, superior technology methods, a positive impact on all partners and better decision-making. Hence, the utilisation of Building Information Modelling (BIM) in a project will certainly ring-fence the construction industry, particularly in transportation project, from the COVID-19 insurgence.

Project Communications Management

Due to the COVID-19 pandemic, communications has become a critical element for ensuring the successful completion of project activities in any sector. Project communications management is often described as the exchange of information in order to reach a shared understanding, which is defined as a system for transmitting information between individuals or organisations. According to the Project Management Institute (PMI), managing project communications is a process that guarantees information about a project is available and that the demands of stakeholders are addressed via the implementation of various activities (PMI, 2017). The PMI emphasises that project communications management is most critical during planning, execution, monitoring and controlling stages and serves as an important mechanism for evaluating project and stakeholder knowledge needs by implementing practices that will improve the efficacy of information exchange. It has been observed that construction companies which prioritise effective communications outperform those which do not. Companies that communicate effectively will complete more than 80% of their construction projects on time, within budget and with high standards of quality, as well as achieve other value systems for customers (Olanrewaju, Tan, & Kwan, 2017). Therefore, in order to ensure effective information exchange throughout the project, it is critical to do so right from the beginning by developing an effective communications plan prior to the commencement of a project. In the construction industry, communications can be defined as the exchange of project information and processes between sender and receiver to make the information and processes clear to both. A project manager needs to learn how to understand and share information in the best way possible. Additionally, the construction industry (and transportation projects) is a dynamic sector with several stakeholders whose interactions require information analysis and transfer. Effective communication of project information contributes to performance in terms of cost, time, quality, sustainability and comfort. In principle, the complex nature of transportation projects involving several stakeholders increases the chance of jeopardising project communications management efficiency. Information transfer is critical since changes frequently occur over the course of completing a job in a project. Each project retains its own distinct set of critical aspects. A project may also involve a single unit or many units from the same organisation or multiple organisations.

Recognising its importance, the Project Management Body of Knowledge (PMBOK) recommends two approaches for developing the project communications management action plan.

First is to develop a strategy to ensure effective communications with all stakeholders and then to put that strategy into action (PMI, 2017). Three communications models form the foundation for the development of different communications frameworks: Linear, interactional and transactional. Each takes a different look at how communication works. The most common model is linear (See Figure 1. Shannon-Weaver' Model of Communication), which shows how a sender sends a message to a receiver through different communication channels, with noise and barriers in the way (Shannon & Weaver, 1948).

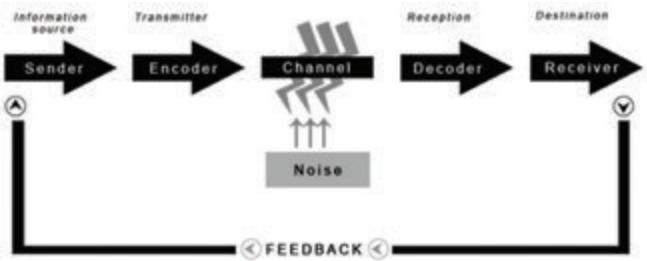


Figure 1: Source: (Shannon & Weaver, 1948)

Furthermore, there are differing viewpoints on the effectiveness of communication channels, which vary according to the project milestone and direction. Although communications in a project is done formally through meetings, briefings, document distribution and other means, most instructions are given through informal communication. Generally, verbal communication (also known as face-to-face communication) is the best way for project managers to get the information across because there are no barriers. Two-way face-to-face communication with written documents or other printed information is a good way to avoid misunderstandings in a group with many/different people.

In most cases, important decisions are made via upward communication to address issues with top management regarding costs, risks and design improvements. This mode

of communication will spark ideas and suggestions which will help the organisation grow. Meetings, discussions, site visits, document reviews and even progress reports are commonly used to facilitate discussions. On the other hand, the downwards communication mode, which traditional organisations prefer, is intended to provide direction and obtain updates on recent site development.

Figure 2a: Front cover of the National Construction Policy 2030

The significance of a downward communication mode is that it allows for the collection of details on resource planning and feedback on-site conditions for future review and scheduling. While this is true, lateral communication occurs among project stakeholders. As a result, it facilitates the formation of partnerships among various stakeholders, resulting in the successful completion of the project.

Understanding the role of project communications management in today's scenario is vital to project management. For these reasons, it is critical to ensure that communications management practices on construction sites, particularly in transportation projects, adopt new technology that will benefit and further improve the quality of communications management in accordance with the most recent on-site requirements and improvements. Failure to address the changes can lead to project failure. Given the construction industry's economic contribution, further delays in efforts to improve project performance may have an impact on the nation's growth.

Digitalisation Transition in the Transportation Projects

In response to the National Construction Policy (NCP) 2030 (Figures 2a & 2b) by the Ministry of Works Malaysia as well as the COVID-19 pandemic situation globally, the construction industry and transportation projects should move towards digitalisation (MOW, 2021). The numerous projects outlined to support the National Transportation Plan 2019-2023 (Figures 3a & 3b) which aims to develop

Figure 2b: Main objectives of the National Construction Policy 2030

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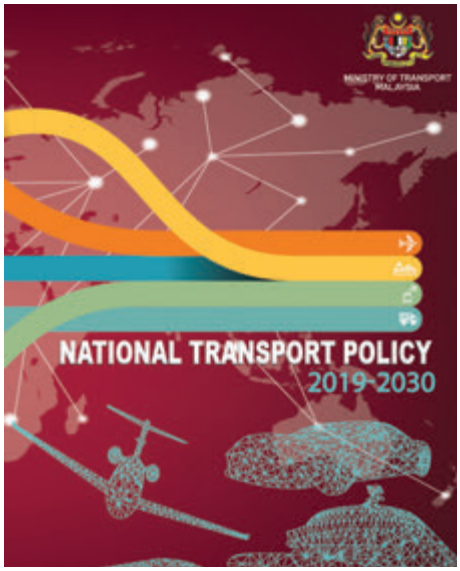

Figure 3a: Front cover of the National Transport Policy 2019-2030

a sustainable transportation sector that accelerates economic growth, will certainly require a pragmatic approach to ensure the smooth execution of projects (MOT, 2019). One way to convert conventional methods to digitalisation is through BIM, a process that facilitates construction project stakeholders in terms of communicating project information throughout the project life-cycle by using suitable software. But although BIM can help minimise project miscommunication and improve project delivery, its implementation in Malaysia is still minimal.

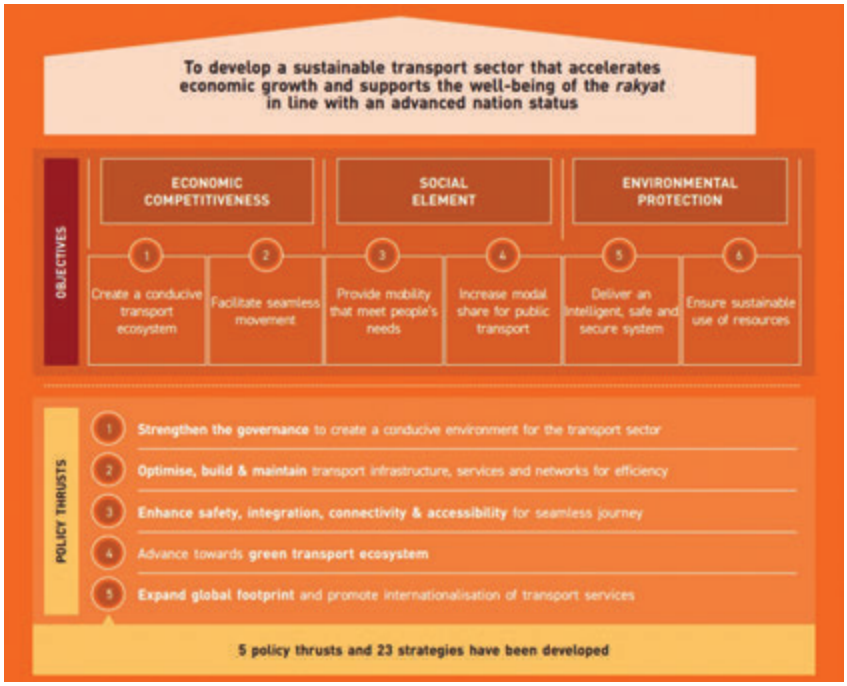

Figure 3b: The principles of Sustainable Transport

This is mostly due to the high cost of initial investment to acquire suitable software and for stakeholders involved in the BIM process (Eadie *et al.,* 2013) to attend the necessary training. Moreover, there is no requirement to implement BIM in projects of less than RM10mil in value, especially government projects. This makes most construction project stakeholders reluctant to utilise BIM in their projects. During the COVID-19 insurgence, the lack of understanding among construction project stakeholders about BIM was also one of the major problems affecting its implementation in Malaysian transportation projects (Subramaniam *et al.,* 2021).

However, BIM had greatly helped transportation project stakeholders to overcome the COVID-19 insurgence which badly affected the industry. It has been shown that BIM is capable of improving project delivery by

implementing project communication management using BIM software (Deloitte, 2020). BIM software can be used efficiently in data transfer and real-time updates between stakeholders. Furthermore, it can help to ensure the continuity of project communication management between the stakeholders by initiating virtual meetings using related software. This practice can help prevent communication breakdown in transportation projects, especially with the implementation of the "work from home" strategy due to rising COVID-19 cases. Nowadays, people can opt for a hybrid mode where some may physically attend a meeting and others attend virtually. This will minimise contact and ensure the social distancing procedure is adhered to.

In addition, BIM allows the project team to easily view, edit and update necessary project information such as design drawings, request for information (RFI) documents, project schedules, project costing and other documents in real-time speed because the information stored is accessible to every member of the team. This practice can ensure continuous communication among stakeholders and prevent delays in document transfer.

Moreover, BIM also allows the practice of sustainable efforts such as paperless initiatives when attending site visits. Stakeholders can review drawings, undergo safety and quality inspections and solve on-site disputes by using online documents such as drawings and inspection forms that have been stored on cloud and are accessible by the project team.

Other than that, BIM can also assist in the identification of clashing designs using software and this can be done virtually without the need for a physical meeting between stakeholders. It can shorten the time needed for discussions and decision-making, thus making the project delivery smooth. In normal practice, stakeholders must initiate a meeting to discuss the potential design clash on-site and they have to resolve it separately within their respective disciplines which is extremely time-consuming and highly prone to human error. With BIM, the changes can be updated concurrently and the stakeholders can get real-time update on possible changes.

Managing a transportation project during the COVID-19 insurgence was challenging, especially in achieving effective cost management, on-time project delivery, efficient site planning and minimum disputes throughout the project life-cycle. Using BIM to maintain a good communications management plan for the project stakeholders will definitely help overcome the challenges.

Besides, most construction project experts agree that industry players have to consider future problems, especially in transportation projects, if the conventional method is not digitalised and implemented.

The implementation can be expedited by subsidising the initial investment cost, including software acquisition, which will help transportation industry players start implementing BIM in their projects. Apart from this, providing sufficient training and seminars to equip transportation project stakeholders will also help them better understand the role and function of BIM.

The integration of BIM in transportation projects, especially during COVID-19 endemic period, will reduce major problems in the construction project, such as design clash, cost overrun, project delays and disputes between stakeholders.

Conclusion

The Malaysian Government's SOPs place pressure on the construction industry, notably transportation projects, by only permitting strict communications platforms, limiting face-to-face communication and restricting physical site document exchanges at construction sites. Communications is the most important instrument for integrating and maintaining close contact with all project operations. As a result, project communications management is critical to the success of a project, particularly in the transportation industry. As we are still under threat from COVID-19, the implementation of technology-based tools such as BIM is assuredly the best approach to ensure the sustainability of the construction industry, especially in the transportation projects. ■

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Engineering a Better Solution

Project Management Conference 2022

Written and Prepared by:

Ainarull Assikin Abdul Hadi

Ir. Prof Dr Syuhaida Ismail

The Project Management Conference (PROMAC) 2022, sponsored by Affin Bank Berhad and KLCC Projeks Sdn. Bhd., was held on 19 March 2022 from 9 a.m. to 5 p.m. at Kuala Lumpur Convention Centre, Malaysia.

The inaugural event organised by the Project Management Technical Division (PMTD) was attended by close to 205 participants, both physically and online. PROMAC 2022 showcased 3 themes: Construction Mega Project in Malaysia (Infrastructure), ICT & Digital Project Management and Managing Projects in the Energy Sector.

Held in conjunction with the 1st Malaysian Engineering Exhibition & Conference 2022 (ENGINEERTM), it brought together influential speakers from diverse backgrounds in project management to talk about current and emerging practices across different spectrums. Participants included project stakeholders from across the value chain of the industry, such as project owners, regulators/authorities, government agencies, consultants, contractors, investors, CAPEX financing institutions and academicians.

PROMAC featured prominent speakers in project management and the aim was for all participants to discuss and share knowledge on current and emerging technologies and practices. The feedback from participants showed that this had been achieved.

Figure 2: Y.Bhg. Datuk Ir. Hj. Mohamad Zulkefly Sulaiman giving his keynote speech

The national-level conference not only provided a great opportunity for creating business relationships but also in terms of exchanging ideas on the latest trends and techniques with respect to project management implementation as well as offering the views and opinions of technical expert on current mega projects in Malaysia and around the world.

Figure 1: Speech by PROMAC 2022 organising chairman, Ir. Dr Harris Abd Rahman

Figure 3: IEM President, Ir. Ong Ching Loon presenting a token of appreciation to Y.Bhg. Datuk Ir. Hj. Mohamad Zulkefly Sulaiman

PROMAC 2022 also showcased the latest developments leveraged on project management expertise in various industries.

The event started with speeches by PROMAC 2022 organising chairman Ir. Dr Harris Abd Rahman (Figure 1), and IEM President Ir. Ong Ching Loon. This was followed by a keynote speech delivered by Y.Bhg. Datuk Ir. Hj. Mohamad Zulkefly Sulaiman, the Director General of Jabatan Kerja Raya (JKR) Malaysia (Figure 2 and Figure 3) and the Plenary speech by Ir. Norhasita Mohd Yusof, the General Manager, Centralised Organisation Programme Management Division, Telekom Malaysia Berhad (Figure 4).

Figure 4: Participants listening to the plenary speech by Ir. Norhasita Mohd Yusof, the General Manager, Centralised Organisation Programme Management Division, Telekom Malaysia Berhad

Theme 1 on Construction Mega Project in Malaysia (Infrastructure) was chaired by Y.Bhg. Dato' Ir. Dr Ahmad Anuar Othman, with panellists Supt (R) Tharamadurai Ramanathan, Head of Department, Security, Safety, Health & Environment, Malaysian Resources Corporation Berhad (MRCB), Y.Bhg. Dato' Ir. Ahmad Redza Ghulam Rasool, Deputy Director General (Infrastructure Sector) from JKR, Ms. Zaidatul Ahmad Zubel, General Manager, PJH Project Division from KLCC Projeks Sdn. Bhd. and Mr. Leo Leow Woon Hwoi, Country Director of Turner & Townsend Malaysia.

For **Theme 2** on ICT and Digital Project Management,

Figure 5: Ir. Wan Rizaluddin Abdullah Wan Ali chaired the Theme 3 session on Managing Projects in the Energy Sector

chaired by Ir. Dr Nor Azhar Mohd Arif, Chairman of PMTD, the panellists were Dr Mohd Shahrul Azmi Mohamad Yusoff, Director of Centre of Innovation in Smart Manufacturing, SIRIM, Ir. Norhasita Mohd Yusof, General Manager Centralised Organisation Programme Management Division from Telekom Malaysia Berhad and Ms. Subathra Pancharam, Senior Project Manager from Malaysia Digital Economy Corporation (MDEC).

Theme 3 on Managing Projects in the Energy Sector was chaired by Ir. Wan Rizaluddin Abdullah Wan Ali (Figure 5), committee member of PMTD and the panellists were Mr. Khaled Higgy, Project Director from Fluor Daniel International, Ir. Chow Pui Hee, Group Managing Director from Samaiden Group Berhad and Ir. Ts. Dr Wan Syakirah Wan Abdullah, Head of Business Assessment & Engineering from TNB Renewable Sdn Bhd. They spoke about various cutting-edge technologies, tools and methods of project management based on their interesting experiences and knowledge involved in the real case studies of the specific industries of each individual theme, all of which benefitted the participants of PROMAC 2022. It is hoped that this event will be continued in next coming years (Figure 6). ■

Figure 6: More than 80 participants from the Project Management fraternity attended PROMAC 2022

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PMTD: CSR Programme at Seri Semarak Urban Farm

Written and Prepared by:

Mr. Chitdrakantan Subramaniam

Assoc. Prof. Ir. Dr Syuhaida Ismail

On 11 June 2022, the Project Management Technical Division (PMTD) organised a Corporate Social Responsibility (CSR) cum Outreach Programme at the Urban Farm owned by the B40 community in Projek Perumahan Rakyat (PPR) Seri Semarak, Air Panas, Kuala Lumpur. It was held in collaboration with Green Cities & Construction Research Group (GCCRG) of Universiti Teknologi Malaysia Kuala Lumpur (UTMKL).

Taking part were 9 PMTD committee members, Welfare Department Malaysia (JKM) and the Resident Association of PPR Seri Semarak (Seri Semarak RA).

It started with a welcome speech by Ts. Khairul Zahreen Mohd Arof, the Project Manager from GCCRG, who briefly explained the implementation of the urban farm, a brainchild of GCCRG and Seri Semarak RA.

The farm is funded by the Institute of Electrical & Electronics Engineers (IEEE) to empower the residents through urban farming activities and engineering technovations such as the Internet of Things (IoT) which can potentially improve their livelihood, especially during the uncertain COVID-19 endemic phase. He further explained that the farming methods are based on the types of plants and available land area. The land is planted with vegetables including chilli, eggplant, water spinach and lemongrass as well as MD2 pineapple and lemons. The farmers use the fertigation system which is planned for monitoring through IoT devices. However, due to the unforeseen circumstances, the potential funder for these IoT devices had halted the plan since last year.

In his remarks, Ir. Dr Nor Azhar Mohd Arif, Chairman of PMTD, praised the GCCRG's efforts to assist the B40 community at PPR Seri Semarak and the Seri Semarak RA to utilise available environment-friendly resources to improve their standards of living. He suggested that PMTD may extend its expertise and provide on-site talk on ways to manage the entire supply chain. Ir. Dr Azhar also suggested further streamlining the mechanisms in place to manage the farm better. Apart from that, the PMTD committee members and volunteers from JKM lent a hand during the regular gardening sessions.

The programme also received attention from the Setiawangsa Member of Parliament, Y.B. Nik Nazmi Nik Ahmad, who was present and gave his support for enhancing the urban farming initiative.

To conclude the programme, Ir. Dr Azhar handed over IoT devices for the plant monitoring system, valued at RM1,500, to Ts. Khairul who represented the B40 community of PPR Seri Semarak (see Figures 1 and 2: Group photo). ■

Figure 1: PMTD committee members and PPR Seri Semarak residents

Figure 2: PMTD committee members with Y.B. Nik Nazmi Nik Ahmad

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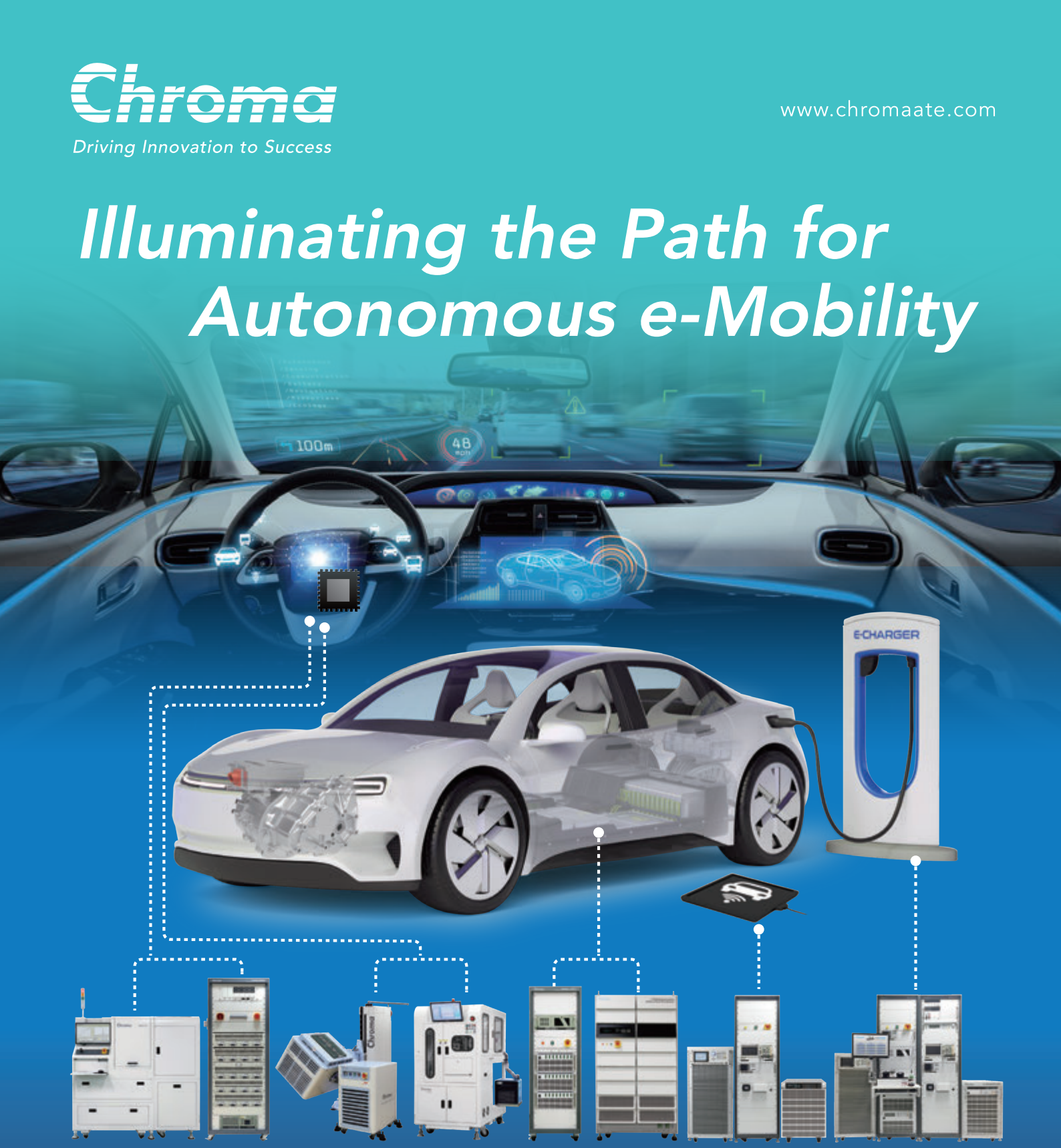

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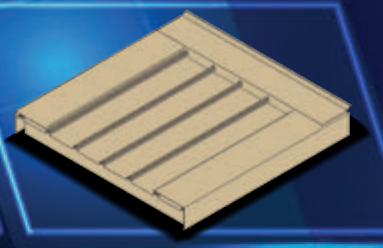

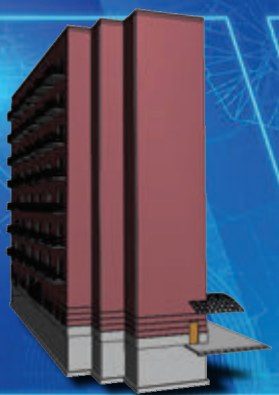

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Women Engineers Conference 2022: Building the Future, WE Lead

Written and Prepared by:

Ir. Heng Lee Sun

In conjunction with International Women's Day celebrations in March 2022, the Women Engineers Section of The Institution of Engineers Malaysia (IEM), Penang branch, organised the first Women Engineers Conference 2022 on 4 March with the theme, Building the Future, WE Lead.

Over 100 delegates attended the conference at Bayview Hotel Georgetown, Penang, which was officiated by Penang Deputy Chief Minister Y.B. Dato' Ir. Hj. Ahmad Zakiyuddin bin Abdul Rahman, with Y.B. Chong Eng, Chairperson of Penang Women's Development Corporation, as the special guest. Invited speakers included Y.Bhg. Professor Datuk Ir. Ts. Dr Siti Hamisah, Dato' Ir. Dr Goh Teik Cheong, Ms. Ong Bee Leng, Professor. Ir. Dr Taksiah, Ts. Regine Choo Hooi Chin, Dr Thong Sze Yee and Ms. Angeline Goh Pei Leng.

Conference Chairperson Ir. Heng Lee Sun (see Figure 1) said the event received huge support from all IEM Penang Women Engineers, while working crews of the Young Engineers Section volunteered their time. She was grateful the event went smoothly as there were many challenges, especially during the pandemic. Indeed, they had planned for a whole year, with the various partners putting in lots of hard work and effort, connecting the dots from the draft to the completion of the conference.

Generally, women play many roles in their daily lives. Being a woman means having a strong sense of multiple identities; they juggle their roles of career woman, wife, mother, daughter, sister, babysitter etc. Balancing the demands of all roles is important to ensure sustainable and continuing success as each role needs full responsibility and commitment. Women are gifted with the unique ability to perform multiple tasks and be as detailed as needed. The conference brought together the leadership and achievements shared by women engineers in different industries and highlighted the equality challenges that they faced. There were two panellist discussions during the conference with good interactive feedback from the audience. (See Figure 2 Group photo).

We learn from the past, manage the present and plan for the future – Building the Future, WE Lead. ■

Figure 1: IEM Penang WE Conference Chairperson Ir. Heng Lee Sun

Figure 2: Group photo (right to left): Ir. Heng Lee Sun, Ms. Angeline Goh, Ir. Yau Ann Nian, Ir. Ong Ching Loon, Prof. Datuk Ir. Ts. Dr Siti Hamisah, Y.B. Chong Eng, Y.B. Dato' Ir. Hj. Ahmad Zakiyuddin, Ir. Bernard Lim, Dato' Ir. Dr Goh Teik Cheong, Ms. Ong Bee Leng and Ir. Catherine Sim

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Updated May 2018

Panmunjom: Bridge of No Return

Note: This is Part 2 of an article on Panmunjom by Ir. Dr Oh Seong Por. Part 1 was published in the June issue of *JURUTERA*.

Written and Prepared by:

Ir. Dr Oh Seong Por

The Past Chairman of IEMNS and Director of Samsung SDI Energy (M). Sdn. Bhd.

Standing over the Sachon River which flows through the Joint Security Area (JSA) at the Panmunjom Demilitarised Zone in the Korean peninsula is the Bridge of No Return. At the end of the Korean War, prisoners of war were repatriated at this point. Once the bridge was crossed, there would be no return. Still intact today, the Bridge of No Return is under 24-hour surveillance by UN Command (UNC) and North Korea People's Army (KPA) guards stationed at command posts at both ends of the bridge.

The Axe Murder

An incident dubbed the Axe Murder occurred near the bridge in August 1976 where two UNC officers, Major Arthur Bonifas and Lieutenant Mark Barrett, who led a team of workers to trim a poplar tree located near the bridge, were slain by 30 KPA soldiers.

After the incident, the world watched to see how the United States would respond. The US launched Operation Paul Bunyan in which a team of highly trained commandos, with support from standby units comprising marine, navy and air force personnel, re-entered the area and chopped down the tree. The KPA soldiers remained at their posts and did nothing.

Bridge of No Return

Security Protocols

As the JSA is a hostile zone, all visitors have to abide by strict security protocols and observe specific prohibitions – such as talking unnecessarily or displaying hand gestures, especially to KPA guards. Taking photographs of the KPA guards is also forbidden.

Visitors are not allowed to cross the Military Demarcation Line (MDL) except within the Military Armistice Commission Building and under the supervision of UNC guards. Before being allowed to enter the JSA, every visitor is required to sign a disclaimer letter that fully absolves the UNC of any liability in the event of an attack by the enemy leading to bodily injury or death.

A meeting being held inside the MAC Building

Site Tour

After having attended the briefing and signed the disclaimer, we were asked to board the bus which brought us into the JSA and to the first stop which was Freedom House. Visitors were then asked to alight and were ushered into the Freedom House Pagoda.

Built on higher elevation, the Pagoda offered a bird's eye view of the blue Military Armistice Commission (MAC) Building and the North Korean Pan Mun Gak Building. KPA guards at Pak Mun Gak Building watched us closely by using binoculars and cameras fitted with zoom lenses. They were constantly observing us for any improper gesture or for non-compliance with rules, which could then be used by the KPA to file a complaint to the UNC.

From here, visitors had to walk for a short distance to the MAC Building. Upon entering the building, one would immediately notice the long meeting table with the North and South Korean flags placed on opposite sides. The MDL runs across the centre of the table. Visitors are allowed to cross the MDL and enter North Korean territory within the building under the watchful eyes of guards.

I crossed the MDL to the North Korean side and took a photograph with a well-built UNC guard who was standing at full attention. We were aware that KPA guards were observing us closely through the windows, but this did not bother us as we had adhered to the rules.

Our next stop was UNC Command Post 5 located up the oval road. This is an excellent observation point for visitors as it offers a good view of North Korea, including the Bridge of No Return and the site of the Axe Murder. Although the surroundings looked calm, this was, in reality, a highly hostile and volatile area where shootings or killings could happen at any time and under the slightest perceived provocation.

Despite the truce that had been observed since 1953, the war had technically not ended. Till today the JSA had been able to prevent any major conflict through dialogue and regular meetings. Eventually, for permanent stability, North Korea and South Korea must be reunited through peaceful settlement. Until this is accomplished, the JSA at Panmunjom, which is the last operational demilitarised zone in the world, must continue to exist.

The MAC Building

After Command Post 5, the visitors were brought to another interesting site - the 3rd Infiltration Tunnel, located south of Panmunjom. The visit to the tunnel was another thrilling experience which I would be writing about in a forthcoming article. ■

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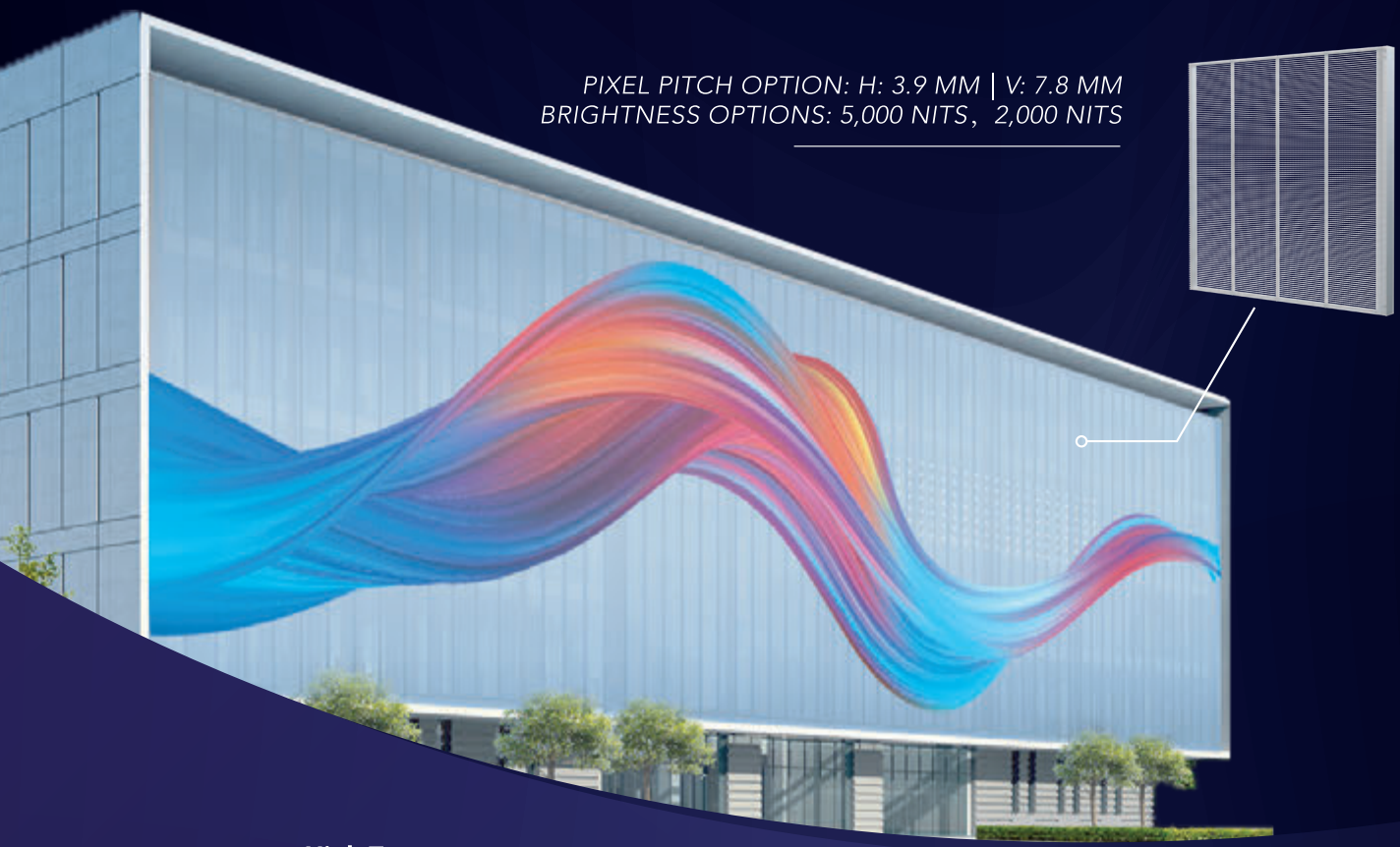

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MOHD AL HAFIZ BIN ISAHAR	BE HONS (UNITEN) (ELECTRICAL POWER, 2010)
MOHD FARID BIN MD KHALID	BE HONS (UTM) (ELECTRICAL, 2007)
MUHAMMAD ASYRAF BIN MOHAMAD	BE HONS (UiTM) (ELECTRICAL, 2017)
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KEJURUTERAAN KIMIA	
CHUA HING LEONG	BE HONS (UTM) (CHEMICAL, 2001)
HENRY INSIONG	BE HONS (UTM) (CHEMICAL, 2008)
KEJURUTERAAN KOMUNIKASI	
JASMAN BIN AGNO	BE HONS (IIUM) (COMMUNICATION, 2009)
KEJURUTERAAN MEKANIKAL	
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71389	NOOR AMANINA BINTI MUSA	BE HONS (UTHM) (CIVIL, 2015)
45294	TAM WAI SENG	BE HONS (KLiUC) (CIVIL, 2009)
116024	TAN JIA XIANG	BE HONS (CURTIN) (CIVIL & CONSTRUCTION, 2012)
52568	YEW PHAIK KHUAN, LINDA	BE HONS (UTM) (CIVIL, 2010)
KEJURUTERAAN ELEKTRIKAL		
61141	AMIN SHAHARUDDIN BIN IBRAHIM	BE HONS (USM) (ELECTRICAL, 2010) ME (MALAYA) (POWER SYSTEM, 2015)
89305	LUM YAN WEI	BE HONS (UTAR) (ELECTRICAL & ELECTRONIC, 2018)
114705	MOHD HAFIZI BIN YUSOF @ ABD TALIB	BE HONS (UiTM) (ELECTRICAL, 2009)
60535	MOHD. ABDUL RAUP BIN PARSAT	BE HONS (UiTM) (ELECTRICAL, 2016) ME (UTM) (ELECTRICAL POWER, 2022)
57571	MUHAMAD MUSHIDI BIN MUSTAPA	BE HONS (UiTM) (ELECTRICAL, 2007)
71203	NORKHAIRIZAL BIN JAMALUDIN	BE HONS (UniMAP) (ELECTRICAL SYSTEMS, 2013)
58634	RIDWAN BIN MOKHTAR	BE HONS (UiTM) (ELECTRICAL, 2011)
95876	STEINOLD PAULI	BE HONS (UTHM) (ELECTRICAL (TELECOMMUNICATION), 2007)
87404	VIGNESWARAN A/L M RATNAM	BE HONS (UniMAP) (ELECTRICAL SYSTEMS, 2008)
104869	VOON YONG JIAN	BE HONS (UPM) (ELECTRICAL & ELECTRONICS, 2018)
81427	YEO JUE CHUAN	BE HONS (SUNDERLAND) (ELECTRONIC & ELECTRICAL, 2015) ME (UM) (POWER SYSTEM ENGINEERING, 2018)
KEJURUTERAAN ELEKTRONIK		
105501	AIRULL AZIZI BIN AWANG LAH	BE HONS (MMU) (ELECTRICAL, 2002) MSc (UTM) (SYSTEMS ENGINEERING, 2019)
99445	MOHD RIDHWAN BIN BAHAROM	BE (HIROSHIMA) (ELECTRICAL, COMPUTER AND SYSTEMS, 2010)
76080	PUTERI SARAH BINTI MOHAMAD SAAD	BE HONS (UiTM) (ELECTRICAL, 2003) MSc (UKM) (MICROELECTRONICS, 2006) PhD (UiTM) (ELECTRICAL, 2014)
KEJURUTERAAN MEKANIKAL		
55120	GOH WEI LOON	BE HONS (UTHM) (MECHANICAL, 2016)
80957	GOH ZHEN HWEE	BE HONS (LEEDS) (MECHANICAL, 2008) ME (UTM) (MECHANICAL, 2014)
64972	KAMSAH BIN OSMAN	BE HONS (UTHM) (MECHANICAL, 2014)
32415	MOHD HASRUL HISYAM BIN CHIK	BE HONS (UiTM) (MECHANICAL, 2010)
31425	MOHD ZAKARIA BIN MOHD SAHAR	BE HONS (UiTM) (MECHANICAL, 2011)
29758	SHAHRUL HAZIMI BIN MUHAMED YUSOF	BE HONS (UTM) (MECHANICAL, 2005)
49198	SIVA PERUMAL KONAR A/L JAGATHISEN	BE HONS (UNITEN) (MECHANICAL, 2013)
105604	WANG HUI LER	BE HONS (QUEENSLAND) (MECHANICAL, 2016)
KEJURUTERAAN PEMBUATAN		
79575	NORHASHIMAH BINTI MOHD SHAFFIAR	BE HONS (IIUM) (MANUFACTURING, 2002) ME (UTM) (MECHANICAL - ADVANCED MANUFACTURING TECHNOLOGY, 2006) PhD (UTM) (MECHANICAL, 2012)
KEJURUTERAAN TELEKOMUNIKASI		
87346	WONG WEI RU	BE HONS (UM) (TELECOMMUNICATION, 2011) PhD (MALAYA) (2015)

PERMOHONAN BARU / PERPINDAHAN MENJADI AHLI KORPORAT

No. Ahli	Nama	Kelayakan
KEJURUTERAAN AEROANGKASA		
101936	LIEW CHEE LEONG	DCAM PART - 66 CATEGORY C HOLDER (2018)
KEJURUTERAAN AWAM		
28316	MOHD AMIN BIN SHAFII	BE HONS (UTM) (CIVIL, 2008) ME (UTM) (CIVIL - TRANSPORTATION & HIGHWAY, 2010)
93858	SYAHMIZZI IFWAT BIN AZHARNIM	BE HONS (UiTM) (CIVIL, 2013) MSc (UiTM) (GEOTECHNICAL, 2015)
KEJURUTERAAN ELEKTRIKAL		
20145	TONG YEAH CHUEN	BE HONS (MALAYA) (ELECTRICAL, 1999) ME (MALAYA) (2011)
KEJURUTERAAN MEKANIKAL		
54261	VIMAL RAU A/L APAROW	BE HONS (UTeM) (MECHANICAL (AUTOMOTIVE), 2011) MSc (UTeM) (MECHANICAL, 2013) PhD (UPNM) (MECHANICAL, 2018)

Pengumuman yang ke-164

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 maklumat lanjut. Senarai penyumbang untuk bulan Mei 2022 adalah seperti jadual di bawah:

NO.	NO. AHLI	NAMA
1	15123	Ir. ZAINOL ARIFEN BIN SAID
2	72584	MR. LOH BOON CHUAN, ANDREW
3	70298	Ir. MD NASIR BIN MD ISA

IEM ENGINEERING HALL OF FAME AWARD 2023

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 2023.

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 **31 October 2022**.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

The nomination form can be downloaded from the IEM website at
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 2023

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 comprise a metal plaque, a scroll and a sum of RM1,000.

The closing date for nominations is **31 October 2022**.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

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

IEM OUTSTANDING ENGINEERING ACHIEVEMENT AWARD 2023

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 award in the form of a metal plaque, naming the achievement shall be given to the organisation or body responsible for the project for permanent display.
- The award shall be presented with due ceremony at an appropriate function of the IEM.

The closing date for nominations is **31 October 2022**.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

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

IEM YOUNG ENGINEER AWARD 2023

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

ii) Graduate or Corporate Members of IEM.

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.

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 closing date for nominations is **31 October 2022**.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

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

IEM WOMAN ENGINEER AWARD 2023

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 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 Award shall comprise a cash prize of RM800.00, a scroll and plaque, to be presented with due ceremony to each recipient of the Award.

The closing date for nominations is **31 October 2022**.

Please submit nominations to:

Honorary Secretary
The Institution of Engineers, Malaysia
Bangunan Ingenieur, Lots 60&62
Jalan 52/4, 46720 Petaling Jaya, Selangor.

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

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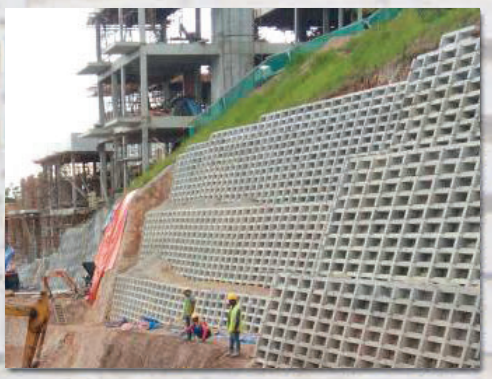

For enquiry please contact:

CRIB TECHNOLOGIES SDN BHD (564096-A), **ARE WALL (M) SDN BHD** (542608-W)

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