eMARINA
The quarterly newsletter of
The Hong Kong Joint Branch of The Royal Institution of Naval Architects
and The Institute of Marine Engineering, Science and Technology,
and The Hong Kong Institute of Marine Technology
皇家造船師學會暨輪機工程及海事科技學會香港聯合分會
及香港海事科技學會季刊
Vol. 4 December 2021

HKJB & HKIMT Activities

9th PAAMES AMEC Conference and ISC Meeting

The PAAMES AMEC 2021 was held from 20 - 22 September 2021. Thanks to the efforts of the HKIMT Chairman, a conference room was setup on the 1st Floor, Central Outlying Island Ferry Pier No. 2, Central, Hong Kong, office of the Hong Kong at HK & Kowloon Ferry for the online Opening Ceremony on 20 September 2021 and the International Standing Committee (ISC) Meeting on 22 September 2021 respectively.

Two papers were presented by Hong Kong in the Plenary and Conference. A paper on "Feasibility Study of MASS in Beijing-Hangzhou Grand Canal" was presented by Dr. KS Fung, HKIMT in Plenary. Another paper on "Simulation and Analysis of Smart Decentralised Modular Robotic Fish with Undulatory Motion and Pectoral Fins" was presented by Mr. Muhammad Saad Shahid, University of Hong Kong in Conference.

On 20 September 2021

Hon Vice-President Mr. Francis LAW and Chairman Capt. TK CHEUNG together with other members Mr. Alan TSANG, Mr. Simon CHEN and Dr KS FUNG attended the PAAMES Opening Ceremony online. Dr KS FUNG presented his paper on "Feasibility Study of MASS in Beijing-Hangzhou Grand Canal" in Plenary after the opening ceremony.

Figure 2 HKIMT Delegates attending the PAAMES Opening Ceremony

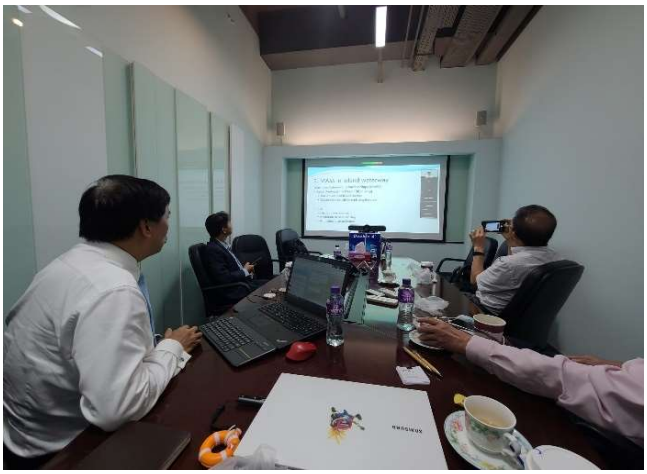


Figure 1 Dr KS Fung presenting at the Planetary Session

On 22 September 2021

Mr. TK CHEUNG, Mr. Stanley LUI (representing HKIE-MMNC), Mr. Albert LO, Mr. Alan TSANG, Mr. Simon CHEN (representing HKJB) and Dr KS FUNG (representing HKIMT) attended the ISC Meeting online on this day.

At the other end of the line were the organiser - Russian Scientific and Technical Society of Shipbuilders named after A.N. Krylov (NTOS); the representative of the North East Asia Division / South East Asia Division of Institute of Marine Engineering, Science and Technology (NEAD/SEAD of IMarEST), Mr. KS Szeto; the representatives from the Japan Society of Naval Architects and Ocean Engineers (JASNAOE) and the representative from the Korean Society of Ocean Engineers (KSOE).

The session started with the report on the PAAMES AMEC2021 by the Chairman. According to the meeting schedule, the host for the next PAAMES AMEC was then brought up for discussion. Japan JASNAOE was proposed and supported by HKIE-MMNC, HKIMT and other delegates as the host for the next PAAMES AMEC in 2023. Japan accepted the nomination. They would provide more information on this coming PAAMES meeting arrangements at a later stage. During the meeting, Mr. Stanley LIU proposed the use of electronic format for the conference proceedings. The Organiser had agreed to prepared and dispatch the information in due course.

Figure 3 HKIMT Delegates attended the ISC Meeting

(Reported by PAAMES AMEC 2021 Delegates)

Technical Visit to Government Dockyard

HKJB and HKIMT jointly organized a technical visit to the Government Dockyard (GD) in the afternoon of 15 October 2021. HKJB Chairman Ir. Simon Chen and HIMIT Chairman Capt. TK Cheung led the technical visit. A total of 28 participants participated in the event on this day. The participating team was received by Dr Peter Lai, Mr. Jammy Ng and Mr. Raymond Lee from the Government Dockyard.

The technical visit was divided into two parts:

A. presentation to the participants on a general understanding of the organization of the government dockyard, and

B. guided tour to the workshops and the dockyard working areas.

As COVID 19 is still an Imminent threat to health, the precautionary measure to limit the number participants was enforced to ensure social distancing could be ensured among them. Therefore, the participants were divided into two groups. When one group participated in Part A activities, the other group would participate in Part B activities. The two groups activities would be exchanged when they had completed their part.

A. <u>Presentation of the organization of government dockyard (given by Dr. Peter Lai)</u>

The Government Dockyard had a humble beginning but had a fairly complicated history of development! Its history went back to the establishment of the Marine Police in 1884. When the Marine Police was established, it had 8 boats, one steam launch and one fire engine. For the maintenance of these vessels, the Harbour Master (later became the Marine Department in 1947) who had the expertise in the field, was appointed in 1906 to help the Marine Police in the maintenance of these vessels. As the fleet size grew, the Yau Ma Tei Police Slipway was constructed in 1914. By 1924, the slipway serviced about 100 government launches. In 1925, the Police Force decided to hand over the responsibilities of maintaining government vessels to the Harbour Master. The procurement, tendering, maintenance and manning of government vessels became its responsibilities. The Police Slipway was renamed the Government Slipway after the take-over! By 1960, the slipway serviced over 500 vessels. The service requirements for the slipway was so tight that the government decided to build a new dockyard in 1968. A new Government Dockyard at Canton Road was completed and hand over to the Marine Department in 1971.

Between 1971 to 1995, the number of vessels maintained by the Government Dockyard at Canton Road continue to increase from 200 to 530. A consultant was engaged to make recommendations on its development in 1986. Its makpr recommendations included the modernization of the management of Government Dockyard by computerization and the outsourcing of maintenance works. However, the recommendation to upgrad the dockyard at Canton Road was abolished due to the developments in the Chek Lap Kok Airport Project.

The Government Dockyard Canton Road site had to be surrendered to the West Kowloon Reclamation Scheme under the Air Port Core Project for development. The Government Dockyard was relocated to a new Government Dockyard

at Stonecutters Island in 1995. The opportunity was also taken to modernize the work of the Government Dockyard. A comprehensive computerized spare part tendering and procurement system, a fleet maintenance system and a crew management system were introduced to meet the various requirements imposed by the government regulations and policies!

The full history and development of the Government Dockyard could be found in the following website: https://www.mardep.gov.hk/theme/port_hk/en/p2ch3_index.html

At present, the Government Dockyard provides maintenance services to over 900 government vessels. These vessels are used by 14 government departments. The major users to the services include the Hong Kong Police Force, Hong Kong Fire Services Department, Hong Kong Immigration Department, Leisure and Cultural Services Department, and Marine Department.

The existing Government Dockyard has a total area of 181,200 m^2 which included a 98,200 m^2 land area and an 83,000 m^2 water basin. There are 22 berths and jetties in the yard., 30 open yard repair spaces, 10 covered repair sheds, 4 movable repair canopies and an oil refilling depot (Diesel and Petrol). The dockyard also has a SyncroLift (with capacity up to 750 tonnes), 3 travel hoists (each capacity is 35, 63 and 200 tonnes respectively), one Crawler Crane (with capacity up to 70 tonnes), and 5 Mobile Cranes (with capacities between 20 to 50 tonnes).

The Government Dockyard is managed and operated by the Government Fleet Division (GFD) within the Marine Department. There are four sections under GFD:

Sections	Functions
Fleet Operations Section	● Operate launches to meet government departments' marine transport needs ● Facilitate the training of launch crew for the manning of government launches
Maintenance and Support Section	● Monitor the work done by GD approved contractors for the maintenance of government vessels ● Provide direct labour for specialized maintenance work ● Monitor and evaluate performance of vessels ● Assess and develop technical matters relating to vessel maintenance ● Coordinate with users to arrange scheduled maintenance of vessels ● Provide IT management services in GFD ● Provide docking & lifting services ● Provide plant equipment & services ● Procure and manage the supply and storage of spare parts and materials
Government New Construction Section	● Liaise with user departments and help them finalize their needs on new vessels ● Design & procure new vessels ● Supervise the construction of new vessels on site
Industrial Safety Section	● Monitor & ensure safety practice in GD ● Facilitate safety training and promote safety culture ● Monitor & pursue environmental issues

B. <u>Guided tour to workshops and dockyard area (led by Mr Jammy Ng and Mr Raymond Lee)</u>

The following workshops/facilities were visited:

- Mechanical workshop

  The mechanical workshop is manned by GD in-house staff and is equipped with the basic machining equipment such as milling machines, lathes and sawing machines to carry out some minor repair works which are urgent and not economically viable to call for tenders. Today, all major mechanical repair works are outsourced to GD approved contractors.

- Propeller workshop

  The propeller workshop is equipped with a pitch measuring machine and a propeller balancing machine to assist the repair work on propellers. By measuring the pitch of a propeller blades and compared them with the factory data, the wear and tear and deformation of the propeller blades can be found. If the deviation is too large, repair work has to be carried out. The propeller balancing machine can measure the rotational balance of a propeller and makes compensation where necessary. This is one of the very few propellers balancing machine in Hong Kong. During the visit, the operation of this machine was demonstrated. A propeller was mounted on the machine, it was spun at high speed. The machine could then detect the unbalance forces on the propeller by measuring the movements on the shaft of the mounted propeller. A new propeller was used during demonstration. As expected, the result shown that the tested propeller was in perfect balance.

- Fuel Pump workshop

  The fuel pump workshop is used for testing mechanical type fuel injectors of diesel engines. During the visit, a staff demonstrated how to use a fuel injector test bed to check the atomization quality of a fuel injector. A functioning injector and a defective injector were used in the demonstration. A working injector would have a fine mist of diesel spraying from the nozzle while a defective injector would have large droplets or narrow jets of diesel ejecting from the nozzle.

- Inflatable Boat and GRP workshop

  Inflatable Boat workshop is used for repairing inflatable craft in the government fleet. While most of the repair work is outsourced today, repair work of inflatable craft is till entirely done by the GD in-house staff for better quality control. The workshop has a good ventilation system to maintain the air quality in the workshop with strict temperature and humidity controls which are most suitable for GRP (glass-reinforced plastic) repair work. The system also protects the workers from the toxic vapour emitted by the adhesives used in bonding the glass fiber.

- Dynamometer Testing Room

  GD is equipped with a dynameter for testing the horsepower and performance of engines. NOx emission from the engines can also be measured during the test.

The dynamometer measures the horsepower of an engine by applying a resistive torque on the engine shaft while the engine is running. The resistive torque was created by a "water brake" which consists of a turbine mounted in an enclosure filled with water. The mechanical energy of the engine is converted into heat energy in the water. The heat generated by the "water brake" is removed by a cooling system during the test.

Besides the above workshops, the tour also allowed the visiting team to have close looks at the 750 tonnes SyncroLift, the 200 tonnes travel hoists and some of the covered repair sheds.

Thanks to the HKJB/HKIMT event organization team: Ms Yoyo Chan, Mr Ian Fung, Mr Simon Tse and Mr Shard Gupta for organizing such a large-scale event despite the looming health threat from COVID 19. The safety and precautionary requirements imposed by the government to combat the spread of COVID 19 were observed. The event was successful completed which set an example on how to organize similar events in future. We look forward to having more technical visits in the coming year.

(Reported by Venus Yu, Leslie Lee and Raymond Lee)

2021-2022 STEM x Marine Vehicle Design and Construction Competition

Aiming to promote the maritime industry among local students and to cultivate innovative talents, the Hong Kong Institute of Marine Technology (HKIMT) organised the 2021-2022 STEM x Marine Vehicles Design and Construction Competition with the support from the Department of Mechanical Engineering and BREED of the University of Hong Kong (HKU), the Association of I.T. Leaders in Education (AiTLE), Hong Kong Institution of Engineers – Mechanical, Marine, Naval Architecture and Chemical Division (HKIE-MMNC), Joint Branch of The Royal Institution of Naval Architects and The Institute of Marine Engineering, Science and Technology (HKJB), Maritime Professional Promotion Federation (MPPF), and Yuen Long Merchants Association Secondary School. This competition was sponsored by HKIMT and the Government Maritime and Aviation Training Fund.

The launching ceremony of the competition was held on 3 November 2021 in conjunction with the Hong Kong Maritime Week at Hong Kong University (HKU). Immediately after the launching ceremony, a workshop was held to brief the school students about the competition and to provide them with the basic knowledge and industrial insights of underwater robotics achievements. Two workshops were held during two consecutive weeks in December 2021. One workshop on 11 December 2021 for the primary school students and the other on 18 December 2021 for secondary school students. The use of software for designing underwater vehicles was presented but tailored according to the knowledge and abilities of the students in each group.

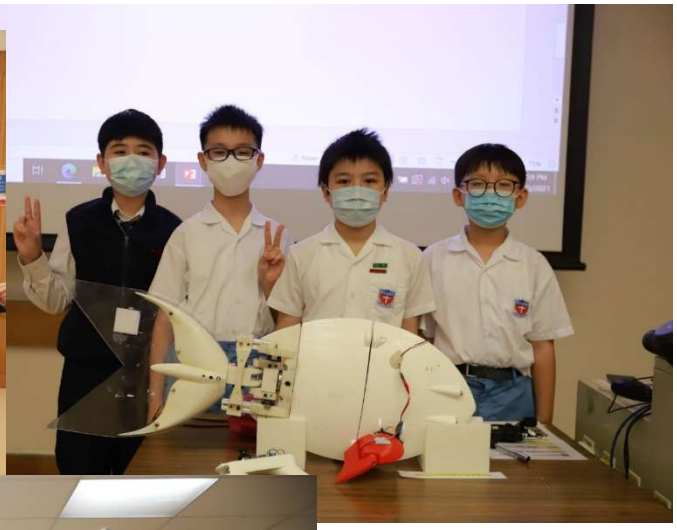
Fifteen teams of students were trained in each workshop. The competition requires the primary school students to design and build a model of an underwater vehicle using 3D printing. And the secondary school students will have to design and build an underwater vehicle model with a minimum cruising speed as required by the competition.

Students attended these workshops were fascinated and motivated by the project. After demonstrated the physics for underwater robotics. These students were eager to start building when they received the tools. The enthusiasm shown and the interaction shown by the students were clear signs of a good start of this programme. In 2022, a series of activities for the competition are scheduled as follows:

- February 2022 - Design submission and workshop on 3D printing and model fabrication.
- April 2022 - Underwater vehicle competition based on speed (for secondary school students), presentation of models (by primary school students), and award ceremony

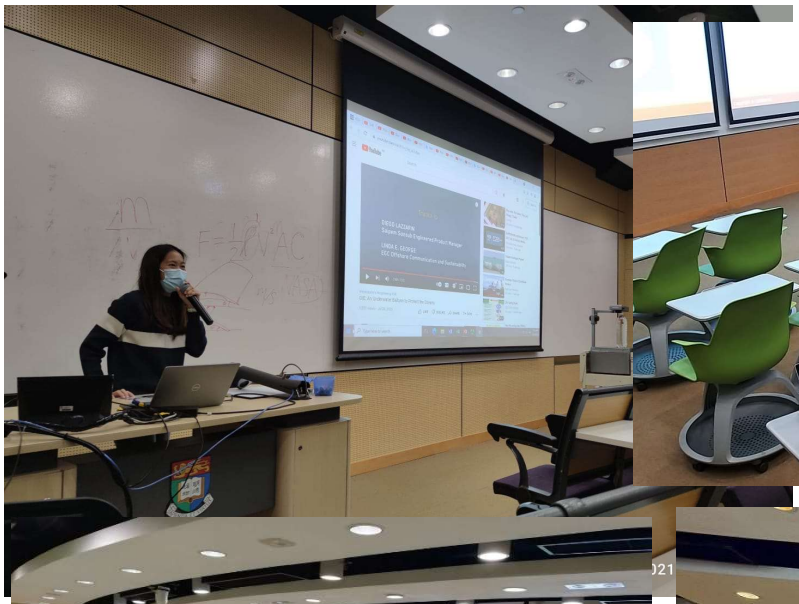
(Reported by Dr. KS Fung and Catherine Fok)

Launching Ceremony held on 3 November 2021 during Hong Kong Maritime Week at HKU



Workshop on Software for Design and Introduction to Underwater Marine Vehicle attended by primary school students on 11 December 2021

Workshop on Software for Design and Introduction to Underwater Marine Vehicle attended by secondary school students on 18 December 2021



OBITUARY

The HKIMT and the HKJB of RINA & IMarEST express our deepest condolence and respect for the passing away of Dr Peter J S Cheng on 26 October 2021 at the age of 92 in Hong Kong. Dr Cheng was the founder member and Fellow of HKIMT, Fellow of RINA and Fellow of IMarEST. He wholeheartedly supported the Marine Industries in Hong Kong over all these years.

After graduating with a First-Class Honor degree in Naval Architecture, Dr. Cheng proceeded to further his quest for advanced theories in Marine Technology and was conferred with a PhD degree in 1959 by the University of Glasgow. Soon after joining his family shipping business following graduation, he proceeded to establish his own consultancy practice. Since then, he has always been personally involved in all the design and consultancy works.

Dr Cheng was awarded as a member in the Most Excellent Order of British Empire (MBE) in November 1995 due to his contribution to the establishment of the autonomous Hong Kong Shipping Register and his continuous services to the Hong Kong marine communities. He is recognized as a renowned naval architect in Hong Kong and Mainland China for over 40 years and was bestowed a special achievement in ship design by Marine Department in 2005.

Honored as the “Father of Capsize Bulk Carrier in China” by the China Ship News, Dr Cheng had initiated the idea of “Green Cape” design. Following this innovative design, the shearing force and bending moment would be reduced by ten percent. Vessel could maintain even keel sailing most of the time. When IMO was still working on the new requirements for bulk carrier, such as cofferdams for the fuel oil tanks, Dr. Cheng was steps ahead to bring his green concept into reality.

Dr Cheng spared no efforts in training the marine professionals in Hong Kong. He has taken considerable interest in the community affairs and has offered his professional experience for the good of the society, e.g., by serving as Council Members of the Hong Kong Polytechnic and the Hong Kong City Polytechnic. It is a great loss to the Hong Kong marine circle on Dr Cheng’s passing, and surely all of us will always cherish the memory of Dr Cheung for his excellence and contributions.

May Dr Cheng rest in peace.

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https://www.imarest.org/local-communities/asia-pacific/hong-kong-joint; and

http://www.hkimt.org.hk/publication.html.

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Enquiry

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