MARINA

The Quarterly Newsletter of
The Hong Kong Institute of Marine Technology and
The Hong Kong Joint Branch of The Royal Institution of Naval Architects
and The Institute of Marine Engineering, Science and Technology

香港海事科技學會及皇家造船師學會
暨輪機工程及海事科技學會香港聯合分會季刊

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HKJB & HKIMT Activities

Technical Visit to Guangzhou China State Marine Diesel Engine Company Limited and Shipyard visit on Longxue Island in Nansha on 20th July 2013

A total of 15 members from HKJB/HKIMT departed from China Ferry Terminal for Nansha Port in the morning on 20th July 2013.

Mr. Zou, Vice Director of Guangzhou China State Marine Diesel Engine Company Limited welcomed us at Nansha Pier and led us to the factory. Upon arrival at the factory, Mr. Zou briefly introduced to us their main products which includes the assembly and testing of marine diesel engine in the range from 8,000HP to 12,000HP as well as the assembly of Tunnel Boring Machine of 6m to 8m dia.

The factory is equipped with all the necessary engine testing facilities such as the sea water cooling system, fuel oil supply system as well as lubricating oil system. The assembled diesel engine is normally mounted on a steel test bed to ensure that it is securely fixed to prevent any engine block vibration and movement during the test.

Group photo in front of a newly assembled Tunnel Boring Machine

Group photo in front of a newly assembled Marine Diesel Engine

After completion of the engine testing and disassembly of all the fixing and connections, the new engine will be lifted to the far end of the factory under the same cover where a barge is berthed along the quay for taking the new engine to the client's factory or for further transportation to other designated place. It was amazing to see that such transportation facility is available within an engine testing and assembly hall.

After lunch, Mr. Zou led us to visit the Guangzhou Huangpu Shipbuilding Offshore Engineering Co., Ltd. Introduction to the shipyard was then given by Mr. Li – Technical Department Minister of the shipyard. He explained to us the work flow for the fabrication and assembly of the vessel hull as well as installation of the auxiliary systems/equipment such as piping systems and electrical equipment /systems.

During our tour in the shipyard, it was noted that some ships were laying idle at the outfit basin in mothball condition. Mr. Li told us that they were facing a very

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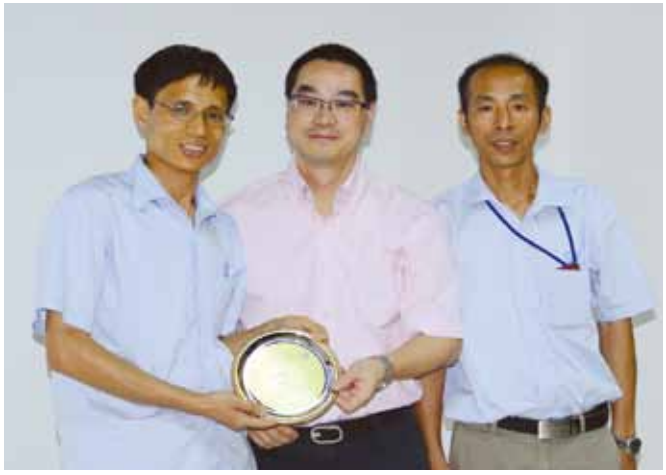

Presentation of souvenir to representatives of Guangzhou China State Marine Diesel Engine Co., Ltd. by Ir. Stanley Lui – chairman of HKIMT

Presentation in progress by Mr. Kwong

difficult period in shipbuilding. There were orders cancelled by the client or the client requested deferment in delivery of the ships.

From this visit, members understood the recent states of the shipyards and engine assembly factory in China. Right now, most of the shipyards are looking for offshore engineering projects as well as other side businesses.

Ir Tang Kai Fun

Two seminars were held at HKIE on 27th July 2013

Maximize the effectiveness of burning fossil fuels and operation mode to reduce greenhouse gases

On 27 July, 2013, HKJB, HKIMT and HKIE-MMNC division jointly held the above seminars at HKIE, Mr. Kwong and Dr. Wong were the speakers. The seminars were divided into two sessions, the first session was contributed by Mr. Kwong who is the Assistant General Manager of Southfleet Consultants Ltd. His presentation was on the topic of "Maximize the effectiveness of burning fossil fuels and operation mode to reduce greenhouse gases". He shared with the audiences on the following aspects:

1. briefly review the background of the Greenhouse gas (GHG) emission control in the Shipping World (*IMO - MEPC MARPOL Annex VI & **ECA regulations);
2. take measures for compliance with relevant regulations;
3. study on existing ship's in-service performance deterioration;
4. Identify the cause(s) of such deterioration; and
5. take corrective measures to improve Ship Energy Efficiency.

From his study on findings of cause of increasing of fuel consumption and insufficient service speed of ship were due to the aging effect on machinery components, hull roughness, marine fouling, torque rich propeller and inefficient propulsion plant as illustrated in Exh. 1. Comparatively speaking, the quantity of greenhouse gases emitted from ships would be significantly increased. He also proposed a simple energy saving device to overcome those causes as mentioned above, for example the propeller boss cap fin (PBCF), which had an energy saving feature for enhancing Ship Energy Efficiency. As a goal, the operating cost of ship maneuvering could be reduced significantly. At the same time, the quantity of

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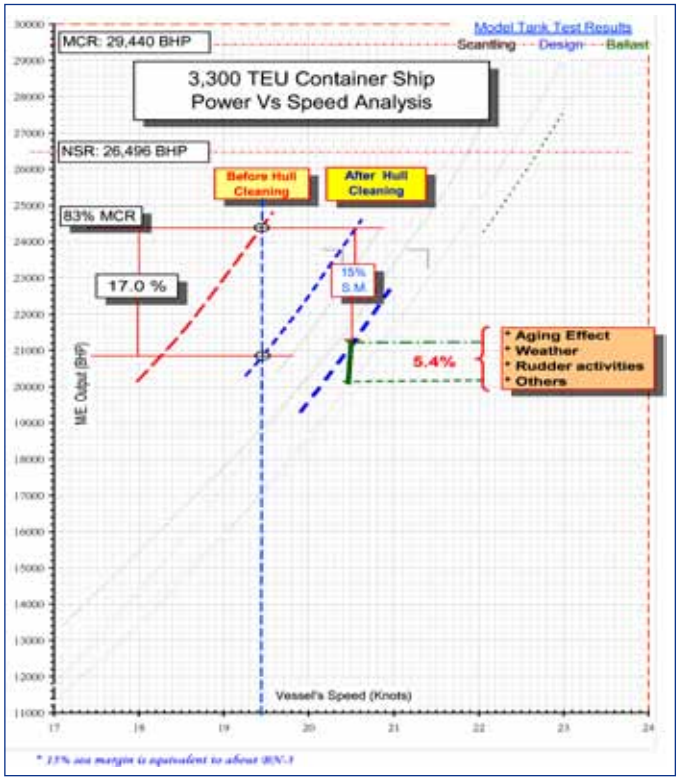
greenhouse gases emitted to the atmosphere could be reduced as well.

He also shared with us on

1. Marine Engine Development in the past 50 years (900cm bore engine as an example).
2. VLCC/ Cape Size Bulkcarrier/ Panamax improvement (1960s ~ 2010s)
3 MAN–PMI System (in place of the traditional Indicating Gear) as per the Exh. below

Exh. - 1 Power Vs Speed Analysis



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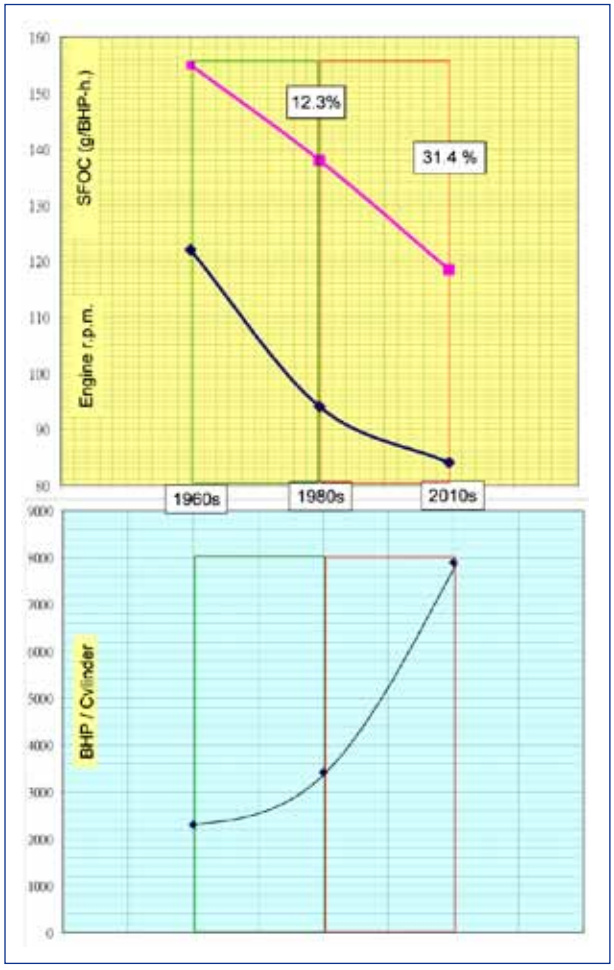
Exh. 2 Marine Engine Development in the Past 50 years



900cm Bore Engine as an example:

SFOC has been reduced by 31.4%.

Engine r.p.m. has been reduced by 45%. With a slower turning propeller a power saving to propel a ship at a given speed can be reduced by about 9.0% power. [(n2 / n1)^0.25].

Power/cyl. has been increased by 329%

HFO price was raised from US$20/ton to $80/ton. [1st Energy Crisis – 1973]

HFO price was raised from $80/ton to $230/ton [2nd Energy Crisis – 1981]

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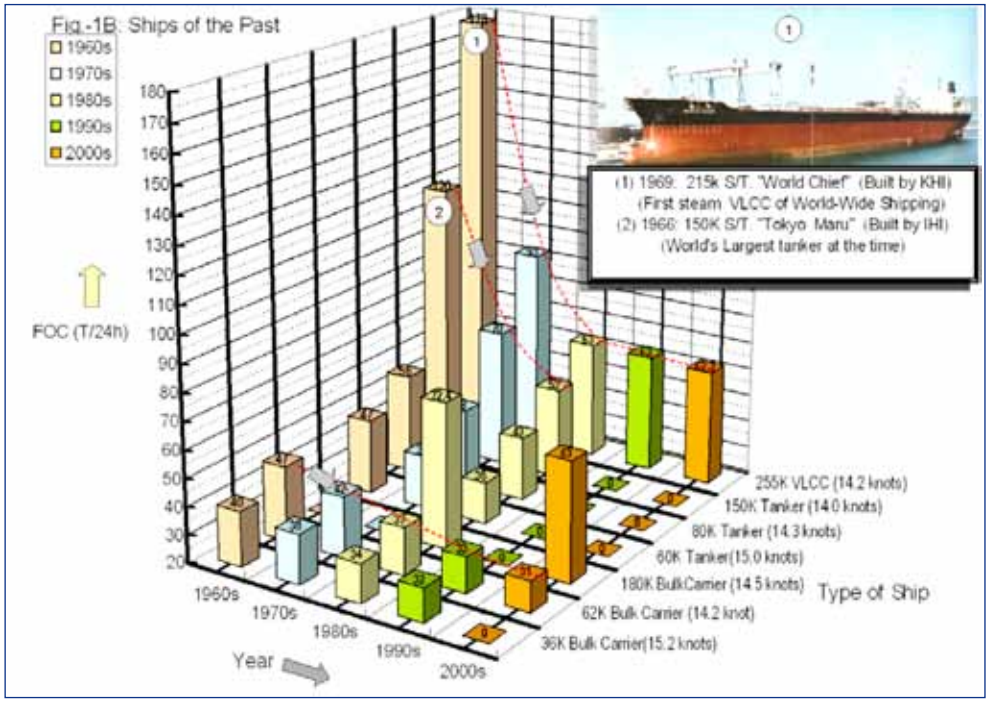
Exh. 3 Ship Energy Efficiency Improvement in the Past 50 years



Exh. 4 MAN - PMI System

Since the ME-C engine is built with no Cam-shaft Drive, which was traditionally equipped with an indicator gear for measuring cylinder pressures and P-V diagram by means of indicator card, MAN has therefore introduced an Off-line PMI System as a standard accessory

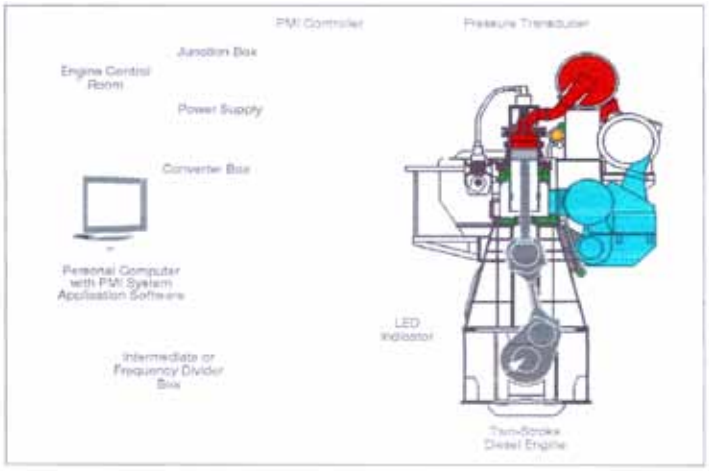


Fig. 2-1 - Schematic of the Off-line PMI System (not to scale)

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Surface Texture Calibration

The second seminar was contributed by Dr. Wong who is the Engineer-in-charge of the Dimension Laboratory, Standards and Calibration Laboratory (SCL), Innovation and Technology Commission, HKSAR Government. His presentation was on the topic of "Surface Texture Calibration". He explained to audiences that surface texture was a major characteristic that affects the performance of a system/ component, including service life, fatigue life, fluid flow, intended functions, bearing properties as well as overall wear and tear. Surface roughness waviness and lay determines surface topography, which is essential for confirming the suitability of an object for its intended uses. He also delivered to audiences with the principles of surface texture parameter and measuring methods and techniques for surface roughness measurement. With explanation from Dr. Wong, the audiences understood that surface texture calibration can help to determine suitable time for replacement of serviced materials or bearings after a long operation cycle.

Presentation of souvenir to the speaker, Dr. Wong, by chairman of HKIMT

Presentation of souvenir to the speaker, Dr. Wong, by chairman of HKIMT

The above two seminars attracted 39 audiences to attend, and we hope that both speakers could arrange similar talks in the near future.

By Mr. Ricky Lai & Ir. Albert Lo

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Visit Green Island Cement Co., Ltd.

In the past decades, concrete is a major construction material and has been used extensively in constructing roads, bridges and buildings etc. around us in a modern city and cement is the vital material in making concrete. So it can be imagined that cement plays a critical role in the development of the world. In order to enhance our knowledge on how cement is produced, the HKJB of RINA and IMarEST jointly with the HKIMT had organized a visit to the Green Island Cement Manufacturing Plant on 28 September 2013. The plant is managed by the Green Island (Holdings) Limited which is a wholly owned subsidiary of Cheung Kong Infrastructure Holdings Limited.

The visiting group comprised of about 13 members and guests. The Green Island Cement Manufacturing Plant (GIC) is located in the Tap Shek Kok, Tuen Mun. Upon arrival to the GIC, Ir Jeffrey Chan and his colleagues of GIC arranged a video show to introduce the background of the manufacturing plant, raw materials and production process of the cement. Their produced cement is classified as Portland cement which is the common type of cement in general use around the world. The designed capacities of the cement grinding and clinker production of the plant are 2.5 million tonnes and 1.5 million tonnes per annum respectively.

Ir. Chan revealed to the group that limestone is the major raw material of making the cement which mainly comes from the Philippines and Mainland China. The limestone

Presentation of souvenir to Ir. Jeffrey K.L. Chan by Ir. Albert Lo – Vice-chairman of HKIMT

Group photo was taken in front of Green Island Cement Building

is a sedimentary rock composed largely of the minerals calcite and aragonite, which are in different crystal forms of calcium carbonate (CaCO3). Other raw materials include ash of coal came from burning coal during the production process of cement inside a kiln, fly ash came from the by-product of coal fired power plants and concrete wastes came from demolished buildings.

The cement production process mainly includes three stages i.e. grinding, mixing and burning. In the first stage, the limestone mixed with steel balls rolling inside the cylinder for grinding. In fact, the steel balls are for "hammering" the lime stones into small particles. In order to improve the effectiveness of grinding, the inner surface of the cylinder is installed with many protruding nails to assist lifting of the steel balls. After completing the grinding, the small limestone particles then mixed with other raw materials such as flyash and concrete wastes in a suitable ratio of content. In the final stage, the mixture is fed into a revolving coal burning kiln for burning at around 1,300^{o}C. The kiln is in cylindrical shape and made of steel with inner surface lined with heat resistant bricks for insulation. The whole process of production is monitored and controlled remotely by the central control room.

After the detailed introduction of the cement production process, the whole group was led by Ir. Chan and his colleagues to conduct a tour at the manufacturing site. During the site tour, we went to see the major facilities of the manufacturing plant including the Pack House, Bulk Barge Loadout Jetty, Dock, Flyash Silo and Classifier,

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Members attending introduction of cement plant operation within the training room

High Volume Air Samplers Station, Limestone Powder Plant, Limestone Storage, Electrostatic Precipitators, Preheater, Grate Cooler, Process Water Cooling, Laboratory and Control Building etc. The function and general information about each individual facility were further explained by the GIC staff. The site tour was also very interesting and many questions were asked during and after the tour. In appreciation of GIC's arrangement for this visit, a small souvenir was presented to Ir. Chan and his colleagues as a token of thanks for their valuable guidance for the visit.

By Mr. Ricky Lai

Final Call - 2013 HKIMT-HKJB Joint Annual Ball 29 Nov 2013 (Friday)

On behalf of HKIMT and HKJB of RINA & IMarEST Annual Ball Organizing Committee, we write to appeal for your support by booking to 2013 Annual Ball Event to be held on Friday 29th Nov., 2013. Table Sponsorship and Individual member registration are still available, we appeal to member's support to make the event successful.

Our Guest of Honour will be Hon. Frankie YICK Chi-Ming, Legislative Councilor-Transport Constituency. Copy of the Event Leaflet and Booking/Sponsorship Form can be downloaded from HKIMT Website (www.hkimt.org). In order to secure your table & individual member seat, please book as early as possible but not later than 17 Nov. 2013.

Both HKIMT and the HKJB of RINA & IMarEST are learned societies with objectives to promote professional development of marine technology & maritime activities. Our Institutes have maintained the tradition of organizing the Annual Ball with great success over twenty years during which many distinguished guests from the Government, shipping companies and members that have great contribution to Maritime Industry in Hong Kong were invited to participate.

This is an annual golden opportunity to meet with maritime professionals, fellow members and business counterparts in a friendly and enjoyable environment and to have great fun.

Your continual support & contribution to our Annual Ball is highly appreciated.

By Ir. Albert Lo

NEW MEMBER - HKIMT

The HKIMT Council have approved Ir. Francis H C Leung as Member at the Council Meeting on 27 August 2013 and a Membership Certificate was presented to Ir. Leung at last meeting Oct. 2013.

Present to Ir. Francis HC Leung by HKIMT Chairman Stanley Lui

Notice

In order to have a better communication channel with members of HKJB and HKIMT, would members of HKJB and HKIMT please send your email address to our Hon. secretary of the following email addresses:

For members of HKJB:
ben.lau@LR.org
Attn: Mr. Ben Lau

For members of HKIMT:
ksfung@vtc.edu.hk
Attn: Dr. K. S. Fung

– THANK YOU –

Coming Events

28 October 2013 (Monday) (19:00-21:00)

- Lubricants for Mechanical parts, Corrosion and Surface Preparation at room no. N003-HKPU

7 November 2013 (Thursday) (18:30-20:30)

- Student Career Talk at room no. Y303-HKPU

18 November 2013 (Monday) (18:30-20:00)

- Technical seminar on 'Requirements in Becoming A Surveyor/Qualified Person in Amusement Rides' at HKIE seminar room

29 November 2013 (Friday)

- Annual Ball 2013 Jointly organised by HKIMT & HKJB of RINA & IMarEST at Kowloon Shangri-La Hotel, Kowloon

3-6 December 2013

- Marintec China Conference, Shanghai

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