

INSTITUTION OF MECHANICAL ENGINEERS HONG KONG BRANCH
TECHNICAL VISIT TO YIU LIAN DOCKYARDS (SHEKOU) ON 27/7/2013



IMechE-HKB delegation to Yiu Lian Dockyards (Shekou)

Shenzhen is not only an important municipal in Guangdong province of the mainland China because of its proximity to Hong Kong, it hosts the largest single vessel repair facility in the southeast Asia. In the morning of 27 July 2013, [20] delegates of Institution of Mechanical Engineers Hong Kong Branch (IMechE-HKB) visited Yiu Lian Dockyards (Shekou) (YLD) in the western coast of Shenzhen and appreciated this major marine engineering establishment neighbouring to the territory.

Background

Located at the mouth of the Pearl River, YLD is about 630,000 m², dimensioned in rectangular shape of 1,150 m times 550 m. It was built on the reclaimed land on the levelled twin island named Mazhou, which literally means “island of twins”.

When the Shenzhen climbed to be the fourth busiest container port in the world, the original dockyard, also along the west coast of Shenzhen whereas with only 148,000

m² of area, was far from sufficient to meet in the increasing demand on ship reparation. Significant expansion was conceived, and the proposal received overwhelming support of the Shenzhen government. Since then the creating of the current YLD on Mazhou advanced in the so-called “China speed”. On 4 December 2003, the Project Profile was submitted to the Shenzhen government for approval. On 16 December 2003 (12 days later), the approval of the Project Profile was granted, together with the consent and support from the related government bodies, such as Port, Land and Resources, Custom and Exercise and Border Guard. In the beginning of 2004 the civil works commenced and in 2008 [four (4) years later] the overall construction finished and YLD entered into operation, with the relocation of the facilities from the original dockyard and production conducted in parallel.

Dry Docks

Sharing the same land with the sister company China Merchant Engineering on Mazhou, YLD has four (4) dry docks which dimensions and capacity are tabled as below:-

| Dock | Dock Type | Inner Length [m] | Inner Width [m] | Max. Draft [m] | Capacity [DWT] | Lift Capacity [MT] | Crane |
|-------|-----------|------------------|-----------------|----------------|----------------|--------------------|-------------------------------|
| No. 1 | Dry | 400 | 83 | 8 | > 300,000 | | 40 t × 2 + 100 t × 1 |
| No. 2 | Dry | 360 | 67 | 8.5 | 300,000 | | 40 t × 2 + 100 t × 1 |
| No. 3 | Floating | 240.5 | 36 | 6 | 70,000 | 25,000 | 50 t × 1 + 40 t + 15 t × 1 |
| No. 4 | Floating | 190 | 27.8 | 6 | 30,000 | 12,000 | 40 t × 1 + 25 t × 1 + 5 t × 1 |



Dry Dock 4 with tug boat under repair

Adjacent to the navigation channel of 15 metre draught, at the planning stage, Dock 1 was conceived to be capable to repair Maersk's 397.71 metre long PS-type container vessel, the largest vessel of its kind with 14,770 TEU (Twenty-foot Equivalent Unit) capacity. Total eight (8) PS-type vessels have entered Dock 1 for reparation in 2011. In 2011 and 2012, YLD enjoyed the highest tonnage of vessel reparation in China. In May and June 2013, 22 vessels underwent works in YLD, which was close to the design capacity of 24 vessels. To strengthen the collaboration with Maersk, YLD has entered a strategic agreement with Maersk in the provision of top quality vessels maintenance and reparation.

Engineering Capabilities

Another show-case of YLD is its outstanding capability in the conversion of marine vessels and ocean engineering infrastructures. In the compliance with the requirement of International Maritime Organisation, single shell oil tankers would have to be converted to double shell before 2011. YLD had rendered total solutions for the conversion, which consumed 20,000 to 30,000 tonnes of steel plates per tanker. Where the single-to-double shell conversions of oil tanker was uneconomical and

upon the oil tanker was in over-supply, ship owners, such as mining companies for the sake of reducing transport cost, acquired oil tankers at low price and converted them into bulk carriers. YLD provided full package of converting single shell oil tankers to bulk carriers.

YLD's strength of offshore platform reparation and conversion shall never be overlooked. Owing to the high demand in technical capability, reparation of offshore platforms is a high value-adding undertaking which is able to enjoy profit margin up to 60 %. To date, YLD has successfully delivered reparation of FPSO (Floating Production, Storage and Off-loading vessel), submerged platform, self-propelled platform and LPG/LNG (Liquefied Petroleum or Natural Gas) vessels of Shell and BP. In addition, YLD has performed retrofit and conversion of self-lifting production platform and offshore living compound platform from their original use for the oil and gas industry.



Jacketed offshore production platforms under reparation

For the warranty of top work quality, YLD partners with key original equipment manufacturers in the marine sectors, such as MAN and Rolls-Royce for its access to their technical support. In parallel, YLD is conscious to health and safety and

environmental protection. It is accredited ISO 14000 in occupational health and safety and prohibits the use of asbestos. It also has its own sewage treatment facility and provides second use of the processed sewage, achieving zero sewage disposal into the sea. Most of its service facilities have been electrified to reduce petroleum fuel consumption and hence emission and the associated air pollution. For instance, compressed air is supplied onshore to eliminate the use of diesel-driven portable compressor.



Offshore accommodation platform under conversion

Subject to the level and scope of services, vessels entering YLD may undergo as minor as an inspection for 15 days, or as extensive as major works for two (2) months to even one (1) year.

Man-power and Amenities and Challenges

To support the extraordinary amount of work, YLD has 10,000 boarding staffs and 20,000 day workers on eight (8) hour shift. Each dormitory block has 12 stories, providing 1,680 dormitories. Five (5) eatery locations scatter across YLD, one of which is western restaurant staffed by chefs recruited from hotels to serve foreigners.

YLD has its in-house clinic manned by (4) doctors and fire brigades, while its tug boats are fire-fighting capable. Boarder Guard and Custom and Exercise station in YLD to facilitate swift custom clearance.

In comparison to Shenzhen, Guangzhou, the provincial capital of Guangdong Province, is more resourceful in marine and naval engineering personnel. YLD attracts practitioners in the marine and naval engineering sector in Guangzhou to Shenzhen and work in it. To attract new blood, in conjunction to posting openings in classified post, YLD's managers make visits to colleges to promote the company.

Having said that, YLD is not without challenge. YLD acknowledges that Singapore is a strong competitor. It is considered the best vessel reparation centre and ranked the top globally in terms of value of reparation. YLD recognises, in contrast to Singapore which shipbuilding industry has been well-established and is mature in management, overall China has much space of improvement in high-end technical capability and safety record. Although China has competitive edge in labour intensive and low value-adding undertakings such as hull overhaul, it is not particularly outstanding in repairing complex and high-value equipments such as on-board electronics and controls, which profit margin may be up to 60 %. The reliance on importing key components remains high and so is the gap in labour quality, in terms of technical skills and safety awareness. As a result, ship owners may be reluctant to let their multi-billion ocean-going assets to be repaired in Chinese shipyards.

Remarks

For many mechanical engineers in Hong Kong, although ship-building and reparation is known to be full of mechanical engineering marvels, its access in the territory is very limited. The technical visit has provided the IMechE members in Hong Kong an opportunity to appreciate the industry closely. The sheer scale and aspiration of YLD has left deep impression to the members. No question YLD is the leading ship repairing facility in Southeast Asia, and its technical and labour capabilities are building rapidly.

IMechE-HKB thanks YLD for organising the informative and inspiring technical visit.

Encl.: Event Poster

WHT

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China Sub-Committee
cum Activity Sub-Committee

TECHNICAL VISIT TO YIU LIAN DOCKYARDS (SHEKOU)



Yiu Lian Dockyards on Mazhou Island, Shenzhen

The above oil and gas mobile offshore drilling unit was Made in China. You may not be aware of, however, that it was built in Shenzhen, Hong Kong's neighbour. The reach of energy and ocean engineering is not as remote as you in Hong Kong may expect.

If you are interested in upstream oil and gas and maritime engineering, join the technical visit to Yiu Lian Dockyards (Shekou) in Shenzhen. In addition to in-depth technical sharing, you will be given access to an offshore oil and gas production platform, which is very rare of its kind.

Date: 27 July, 2013

Time: 1000 hours to 1230 hours

Reserved and free of charge for IMechE members only

Number of participants limited to 10

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