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

Vol 1 : March 2011

HKJB & HKIMT Activities

Seminar on "Calibration of Long Gauge Blocks"

HKJB/HKIMT and HKIE – MMNC jointly organized the above seminar which was held at HKPU on the 7th Jan, 2011. There were about 35 participants attended this knowledgeable seminar. The speaker Dr. Francis Wong is from Standards & Calibration Laboratory of the Government of the Hong Kong Special Administrative Region.

The subjects presented by Dr. Wong including a full spectrum of calibration of end standards which covered traceability and fundamental calibration techniques for end standards by using a typical ML-8 long gauge set (from 150mm to 500mm) and the evaluation of measuring uncertainty had also been presented.

Dr. Wong first explained to us how to set the "unit under test" (UUT) i.e. the gauge block onto the measuring machine together with a standard gauge block. He stressed that it would be better to wait for at least 24 hrs. before performing the measurement in order for the UUT to sit back to its normal stages in view of the different temperature between the UUT and the standard block. He also demonstrated to us if the temperature had a 10% increase, then the uncertainty value would be about 6 to 7 times bigger.

For uncertainty calculation, Dr. Wong said that all the affected criteria should be considered. However as the calculation of uncertainty is quite a complex subject to understand, Dr. Wong advised the participants that any person who is interested in this subject can contact him directly.

Presentation on "Calibration of Long Gauge Blocks" by Dr. Francis Wong

Souvenir presentation by Chairman of HKJB Ir. Dr. Tsui to Dr. Francis Wong

(Ir. Tang Kai Fun)

HKJB 35th AGM

The 35th AGM for HKJB was held on 12 January, 2011 at the banquet room A of the Police Officer's Club. There were about 40 participants taking part in this event. A cocktail reception and a buffet dinner were arranged.

The meeting commenced with the normal formal agenda, i.e. the approval of the 34th AGM minutes, the 2010 branch report by the Chairman, the Hon. Treasurer's financial report, appointment of 2011 Auditors as well as the nomination / election for members of 2011 HKJB committee. There were two special activities followed. One was the best student prize – award ceremony to final year mechanical engineering study student – Miss Leung So Sum from

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http://www.hkimt.org.hk

Group photo of HKJB 35th AGM on 12th January 2011

Long membership certificate presentation to Dr. Peter Ng by Chairman of HKJB Ir. Dr. Tsui

Long membership certificate presentation to Mr. Wang Jen Ning by Chairman of HKJB Ir. Dr. Tsui

Certificate presentation to Miss Ho Ming Wai & Miss Chan Yin Ha of POLYU by Chairman of HKJB Ir. Dr. Tsui

Best Student Award to Miss Leung Po Sum of HKU by Chairman of HKJB Ir. Dr. Tsui

HKU and Certificate of Award for Final Year Project Competition 2009-2010 to Miss Ho Ming Wai, Miss Chan Yin Ha & Miss Pan Chi Fong of HKPU and the other was the IMarEST's 45 years long membership certificate presentation to Dr. Peter Ng Yip Chuen and Mr. Wang Jen Ning.

As reported by the HKJB Chairman Dr. Tsui, that 2010 was another fruitful year for the HKJB in fulfilling the objectives of the parent Institutions in promoting technical and social activities for members and the shipping community in the world. A vote of thanks and appreciation was extended to those retired Committee Members & the retired Chairman – Dr. Tsui for his good leadership in the past two years.

A Committee meeting was held immediately after the AGM. Ir. Y. M. Cheng was elected as Chairman, Ir. Albert Lo as Vice-chairman, Ir. Ben Lau as Hon. Secretary, Ir. Stanley Lui as Assistant Hon. Secretary and Ir. Tang Kwong Fai as Hon. Treasurer for 2011 HKJB Committee.

(Ir. Tang Kai Fun)

Visit to IMarEST HQ London on 10th February, 2011

Y. M. Cheng and Alert Lo with Mr. John Wills, Director Technical & International Development, IMarEST, London on 10 February, 2011.

Hong Kong Joint Branch newly elected Chairman Ir. Y. M. Cheng and Vice Chairman Ir. Albert Lo paid a courtesy visit to IMarEST HQ at Moorgate, London on 10th February, 2011. They met Dr. Marcus Jones, Chief Executive of IMarEST and they had a good discussion with Mr. John Wills, Director Technical & International Development and Mr. Simms, Manager Membership Services on the latest development of IMarEST in membership drives, disposal of existing Headquarter property and exchanged HKJB views on the development of HK and UK in the maritime profession in particular our participation to the Hong Kong Maritime Forum, etc. In principle, HQ has no objection to our participation as a learned society in the Forum in promoting the maritime profession in HK. Mr. Simms also took Ir. Cheng & Ir. Lo to tour their office and met their colleagues in the office.

(Ir. Tang Kai Fun)

HKJB 2011 Chairman Mr. Y.M. Cheng and Vice Chairman Albert Lo with Dr. Marcus Jones, chief Executive of IMarEST, London on 10 February, 2011.

President of RINA in Hong Kong during CNY period

On 10th February, 2011, the President of RINA Mr. Peter French met the branch committee members during a dinner gathering at HKPU in Hong Kong.

During the informal discussion, we understood that RINA will open some branch offices in Mainland China starting from 2011 and the first branch office in Mainland China will be opened in Shanghai during March, 2011.

Also, we know that the number of staff in the head office is less than one dozen and the main task is to prepare the publishing works.

As stated by the President, RINA has a healthy financial account and they are looking closely for all expenses. Asking the job availability for Naval Architects in UK, the President said that young graduates in Naval Architects can get a job without any difficulty for there have a lot of ship design works especially on the off-shore engineering where Naval Architect students are most welcome by off-shore design firms.

As a whole, President of RINA in Hong Kong had a nice and a very friendly dinner gathering with the branch committee members.

(Ir. Tang Kai Fun)

Dinner gathering among HKJB members with the President of RINA Mr. Peter French

Naval Architects and Professional Indemnity

Implicit in the Institution's Code of Professional Conduct is the requirement for members offering services under contract to have professional indemnity insurance. This article from Vincent Egon, Underwriter, Marine Professional & Logistics Liability at Beazley (a Corporate Partner member of the Institution), is a timely reminder of the need for such insurance.

Maritime industries have been confronted with a difficult and unpredictable business environment in the last few years. This is particularly true for marine professionals, including naval architects and marine designers who face two trends that could – without the right precautions – have serious implications for their businesses. The first is a changing attitude to contracts; the second involves an increasing tendency to litigate when things go wrong.

Clients are requesting their marine professionals enter into non-standard form contracts. These can include the designer assuming full responsibility for the "direction" provided by the client – in essence clients want the authority to direct without accepting any responsibility. They can also require the designer to warrant that the material they provide is adequate for the completion of the vessel, without limitation or recognition that the shipbuilder has the responsibility to provide many of the documents necessary to conduct the work.

In addition, while designers typically provide a design package that defines everything necessary for a shipyard to estimate a firm price for the project, they have no control over what the shipyard ultimately does with the design. The possibility exists for the yard / owner to make their own changes, influencing the weight, trim, stability and performance of thevessel. Although the designer may be completely unaware of the modifications made, they potentially remain solely responsible for the vessel's performance, which may not be as intended. This ultimately impacts their reputation and future business prospects.

Robert G Allan FRINA, Executive Chairman of naval architects firm, Robert Allan Ltd., said: "These sorts of contracts should be avoided, but we are often tempted to accept such terms because we have a high degree of confidence in our ability to design vessels well".

"[Under these contracts], the designer is entirely responsible for ensuring that the vessel meets all specified requirements, and achieves the performance required, even when many aspects of that performance are far more embedded in the suppliers' responsibility than their own. Owners in general do not understand or appreciate the level of effort involved in providing a comprehensive and fully engineered design to the level required to be even close to 'foolproof'."

Inevitably, when times are tough, litigation tends to increase as parties look for someone to blame and seek compensation. In the last two years, we have seen a considerable increase in the number and size of claims being brought against maritime professionals. The risk is not just that a designer might be sued for an alleged mistake; increasingly they need protection against being caught up in a case brought against them by a third party.

It is therefore crucial for designers to ensure they have insurance that protects them against the costs of that ligation – not only because without it their balance sheet could be undermined, but also because clients are increasingly insisting that their suppliers have this type of cover.

Many designers are not aware that a specialist insurance market exists; a market that understands the issues and concerns of those seeking protection. Naval architects and engineers face their own challenges and nobody wants to be associated with (or worse, pay for), problems in other professions.

As well as specialist knowledge, financial strength is a key component to look for in an insurance provider – designers need the assurance that their insurer will still be around to pay claims, even if they occur years down the road.

Vincent Egon, Beazley vincent.egon@beazley.com

For information about Beazley, visit their Corporate Partner page at www.rina.org.uk/Beazley

Casualty Information

Information from DNV to the maritime industry No. 8-10 December 2010

Engine worn out in less than 100 hours by catalytic fines

Ship type: All with 2-stroke engine Size (GT): Any Year built: Any

Background

DNV has over the last years seen an increase in engine damage due to catalytic fines, even though the bunkered fuel has been in accordance with ISO 8217 marine fuel specification and fuel treatment is standard procedure and implemented for all vessels. Recent damage, that can be traced back to catalytic fines occurred after only 100 running hours, making the engine totally inoperable. All pistons and liners were totally destroyed and had to be changed.

With the new requirements related to the use of low sulphur fuel in certain areas and the fact that low sulphur fuels have a higher average amount of catalytic fines, we expect to see more of this kind of damage; and care should therefore be taken to ensure that the fuel treatment and tank cleaning is operating satisfactorily at all times.

Course of events

Immediately after a voyage in rough sea, the crew received a high temperature alarm on one cylinder unit on the main engine. When dismantled, the cylinder unit was found completely worn down and had to be exchanged during the voyage. When the vessel arrived in port less than 100 hours after the incident, the crew performed an inspection of all cylinder units. All units, including the newly exchanged one, were found worn to an extent where total overhaul and replacement were required.

Figure 1 Abrasive wear of piston ring.

Figure 2 Micrograph (200x magnification) of a normal liner surface with open graphite structure. Dark areas are showing the graphite lamellae.

Figure 3 Cylinder liner after less than 100 operating hours. Catalytic fines (shown by arrows), abrasive wear traces and closed/partly-closed graphite structure (some of them are encircled in red ovals). Blue arrows shows newly embedded catalytic fines.

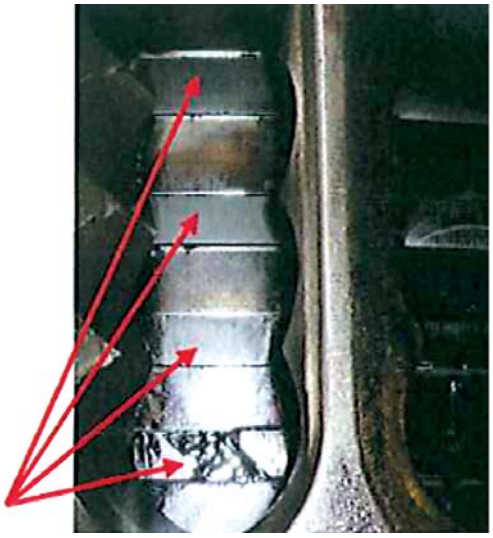

Figure 4 Abrasive wear of cylinder rings (looking through a scavenge air port from the outside).

Figure 5 Abrasive wear inside the cylinder liner above the scavenge air ports.

Probable Cause

Even though the fuel had been delivered within specifications, catalytic fines had over time settled in the fuel tanks. It was reported that the tanks were last cleaned 4 years ago (typical cleaning interval is approximately every 5 years, normally at Main Class Renewal surveys). During the rough weather, the catalytic fines were rapidly circulated in quantities beyond the capacity of the fuel oil separators and the filters, and entered the engine, causing severe damage to the cylinder units.

Below are the results from the HFO samples taken from the affected vessel during 2010:

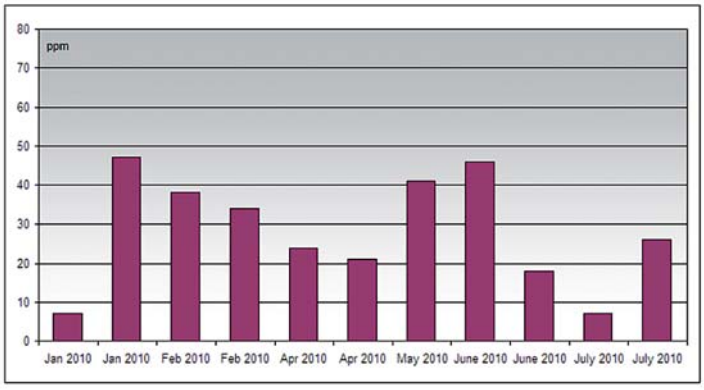

Figure 6
Actual contents of catalytic fines (in ppm) from the HFO samples taken from the affected vessel during 2010. They are all well below 80 ppm, which is the maximum level for the fuel specification.

What are catalytic fines?

Catalytic fines are remnants of aluminium and silicone oxides used in the catalytic cracking process for converting crude oil into lighter petroleum products

in refineries. The catalytic fines are meant to be recycled and will generally become smaller and harder for every cracking process they go through (they can be as hard as 7–8 on a scale where diamond is 10).

It is also important to note that low sulphur heavy fuel oil (LSFO) normally contains more catalytic fines than (ordinary) high sulphur heavy fuel oil (HSFO), which may be due to higher content of heavy cycle oils. Heavy cycle oils may in some cases have low sulphur content, while the content of catalytic fines can be very high.

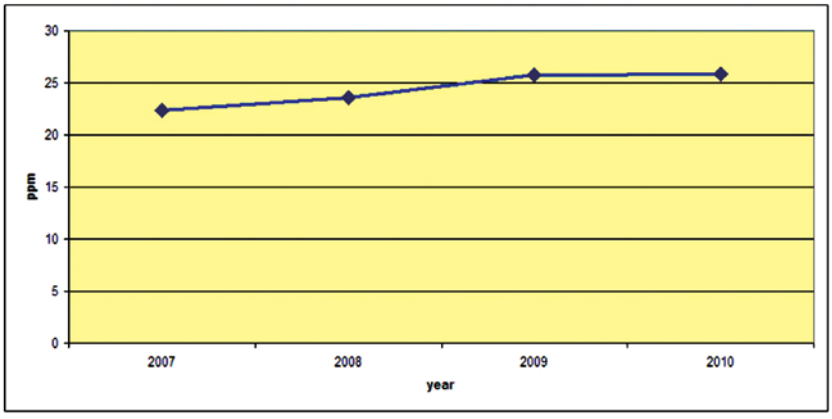

Figure 7
Average catalytic fines in HFO from 2007 to 2010 (results from DNV Petroleum Services).

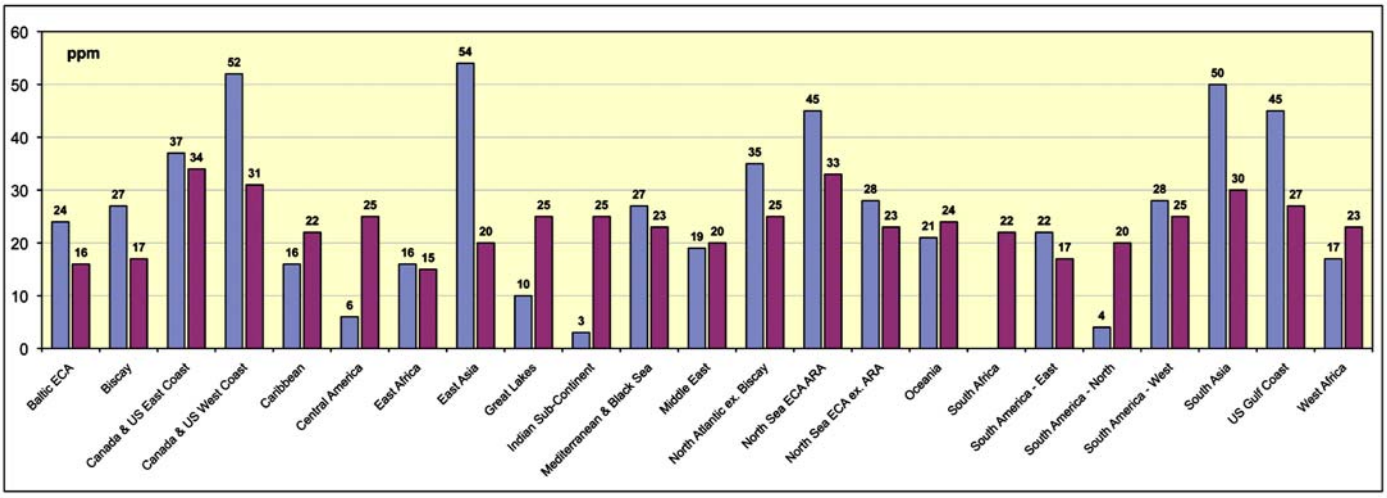

Figure 8 Catalytic fines in ppm in low sulphur fuels, S<1% (blue), compared with regular HFO (red), samples from autumn 2010 (results from DNV Petroleum Services).

Engine makers generally recommend that the inorganic particles of size less than 5μm in the fuel should be less than 20 mg/kg (ppm) and that the contents of catalytic fines should be less than 15 mg/kg (ppm). The smallest particles are in general the most difficult to remove in the separators.

This implies that the vessel's fuel treatment systems (separators and filters) should be able to reduce the catalytic fines contents from 80 ppm (as maximum delivered in the fuel) to max 15 ppm as recommended by the manufacturer.

Lessons learned

- Catalytic fines are aluminium and silicon oxides, which are very hard abrasive particles, and normally a small amount is contained in the fuel oil used by merchant ships. High amounts of catalytic fines following the fuel oil into the engine may cause excessive wear of the components in the combustion chamber (piston grooves, piston rings, cylinder liners) and of the fuel injection equipment.
- The ship's crew should ensure that the vessel's HFO separators work efficiently to reduce the level of catalytic

fines and other impurities. This implies e.g. to ensure the correct HFO inlet temperature. Sometimes system capabilities and wrong set points may result in an inlet temperature which is too low (see manufacturer's guidance for correct inlet temperature). A too low temperature will reduce the efficiency of the separation. It is also important to ensure an appropriate (low) feed rate to ensure purifying and not just pumping.

- Present experience from DNV Petroleum Services shows that in average low sulphur fuels contains higher levels of catalytic fines. However, most of the deliveries are still under the maximum 80 ppm required for the fuel oil specification (ISO 8217).
- Even with bunkered fuel with lower catalytic fines values than the limit, severe damage can occur from accumulated deposits in the storage, service and settling tanks. The ship's crew should be extra vigilant in rough seas to ensure sufficient purification of the oil going into the main engine. It is advisable to run all available separators in rough weather if deposits of catalytic fines can be suspected in the tanks.
- More frequent cleaning of fuel tanks should be considered. These tanks should be drained and cleaned, maybe annually or more frequent if catalytic fines content of bunkers delivered are near to the maximum ISO specification figure for catalytic fines. Relying on Class survey intervals of opening up fuel oil settling and service tanks (cleaned for the purpose of structural inspection) may be inadequate.
- The ship's management may consider taking Fuel System Check (FSC) samples of the fuel oil before and after each separator at regular intervals (maybe 4–6 months) to verify the efficiency of the separators. The samples should be sent to an established fuel analysing institute for analysis.

Coming Events / Activities in 2011

- **March 2011**

2 (Wed.)	Seminar on Hong Kong's Competition Bill (organized by ACEHK)
Mid March	Publish Marina
15 (Tue)	HKJB Committee Meeting
Date TBA	Annual Ball Review Gathering
23-27	Technical Visit to Singapore

- **May 2011**

Date TBA	HKJB Committee Meeting
Date TBA	Technical Meeting
Date TBA	Dragon Boat Race

- **June 2011**

Early June	Publish Marina

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