The eNewsletter of The Royal Institution of Naval Architects, U.A.E. Branch

FEBRUARY 2008

UAE Branch

United Arab Emirates Branch of the The Royal Institution of Naval Architects.

Committee

Chairman
Mr H A Karanassos
Inchcape Shipping Services
PO Box 33166
Dubai
Email: harkar97@emirates.net.ae

Honorary Secretary
Mr T K Pyarilal
J Ray McDermott
PO Box 3098
Dubai
Email: pyarilaltk@hotmail.com

FEBRUARY 2008

Dear UAE Branch member,

The eNewsletter of the UAE Branch of the Royal Institution of Naval Architects is published bimonthly, and is distributed to all members of the UAE Branch. It contains reports of past and future activities of the Branch, and well as selected articles from the Institution's international journals on subjects of particular interest to members of the UAE maritime industry.

The UAE Branch eNewsletter is also available to non-members who are interested or involved in the UAE maritime industry. Please forward the email address of any colleague who would like to receive the eNewsletter to the Secretary. Please also forward any items for possible inclusion in the eNewsletter.

We apologise for the readability aspect of certain portions of the articles in this issue.

Eur Ing Harry Alexander Karanassos, CEng, FRINA
Chairman

Website Links

UAE Branch www.rina.org.uk/UAE

More about RINA journals www.rina.org.uk/publications

More about RINA Events www.rina.org.uk/events

CHIEF EXECUTIVE'S COLUMN

The Institution's 'mission statement' in 1860 was "to promote and facilitate the exchange of technical and scientific information, views and discussion". Providing members and others with access to technical information relevant to naval architecture and the maritime industry remains one of the most important functions of the Institution, but today there are many more sources of such information other than the papers published in the Transactions which were the primary means of accessing information in 1860. The means of accessing such information have also increased, and for many members, the Internet now provides an important and often primary source of information.

Over 5000 papers published in the Transactions and conference proceedings are listed by year, title, author(s) and abstract in the searchable publications database on the RINA website at www.rina.org.uk. However, there is also a wealth of information which has not been formally published, or is unrecorded but which exists in the experience and knowledge of members and others in the maritime industry. The Discussion section of the online Technical Forum provides an opportunity for members and others in the maritime industry to seek that information or comment on a range of topics. Published information not readily available is posted in the News section of the Technical Forum, and members may propose/forward items for inclusion. The Professional Development Forum will provide a similar opportunity on issues affecting education and professional development. Entries posted in the Discussion and News sections of the Forums are searchable. The value of the Technical and Professional Development Forums as an additional source of information will of course depend upon the use made of them by members and others. I would therefore urge members to make full use of the Forums, and suggest that they bookmark the forums at www.rina.org.uk/TechnicalForum and www.rina.org.uk/ProfessionalDevelopmentForum

Branch technical meetings provide another valuable source of information, and where notes or a paper are provided by the speaker, they are posted on the Branch News pages. (Branch Secretaries are encouraged to forward such information for publication on the website).

The RINA website also provides links to other sources of information, for example through the various Maritime Directories - Maritime Services, Maritime Courses and Maritime Organisations - and accredited training courses listed in the Careers page of the website.

For many members, access to information through the printed medium such as the Institution's international journals will remain their preferred source, but the volume and speed of access to information which the website provides cannot be ignored. Future plans include online versions of the journals, to complement rather than replace the printed versions.

Did you know that radio was in existence 38 years before 50 million people tuned in; TV took 13 years to reach that benchmark. 16 years after the first PC came out, 50 million people were using one. Once it was opened to the general public, the Internet crossed that line in 4 years. Fewer than 40 million people world-wide were connected to the Internet 10 years ago. Today that figure is now over 400 million.

Chief Executive

SD14: a model of success

TRADITIONALLY, this column has commented on current events in our global industry or peered forward to examine what might lie ahead. For once, we are allowing ourselves the luxury of looking backwards, but not too far, at what was both a UK and international saga of success. The subject is the SD14 standard cargo ship, whose complete history is faithfully recorded in a newly published book *SD14: The Full Story**.

Although born during the start of Britain's sad decline as a constructor of merchant ships, the SD14 Liberty Replacement will unquestionably win a gold medal for both effort and success. The phenomenon of that eminently simple design, first marketed in 1966 for a figure - incredible though it seems today - of under £1 million (extras were available for those wanting them), has largely been forgotten by many in today's frenetic boom-and-bust world of modern high-technology shipbuilding. By 1988, an amazing total of 211 had been completed (or 228 if all derivatives are included), and more than 50 examples are still believed to be tramping the seas.

Every single one is illustrated in colour with a detailed caption, in this excellent and comprehensive book, which is a sequel to the same author's *SD14: The Great British Shipbuilding Success Story* (1976). Detailed specifications and plans appear at the end.

For those of lesser years, the Liberty Replacement movement of the late 1960s, 1970s, and early 1980s aimed to replicate the success of the original Liberty ships, hastily (sometimes too hastily) assembled during the Second World War in US yards (to a British design by J L Thompson, from Sunderland!). Twenty years after their creation, when quite a number were - despite their original short-term aim - still in operation, enterprising builders around the world decided a market existed for more modern equivalents that could be sold to, mainly, Greek owners who were running most remaining Liberties but who had limited finance to pay for new ships.

Just one of many SD14 successes: *Rupert de Larrinaga*, completed in 1969 at A&P's Southwick yard, was operated on liner services by the UK owner Larrinaga Steamship. As with so many examples of this standard design, she was modified - her accommodation block was enlarged to suit a British crew!

Around 30 designs were promoted worldwide but only two achieved outstanding success: the SD14, from the Sunderland yards of Austin & Pickersgill (Southwick and and South Docks), and the Freedom, conceived by the celebrated Canadian/Bermudan consultancy G T R Campbell and built (mostly) by IHI in Japan - believed to be around 250 in all.

The book, which provides much illuminating detail and insight into the complete SD14 project (the initials stand for shelter deck, not standard design, as some erroneously think, and the 14 for 14,000dwt although, as the author notes, later it became evident that 15,000dwt was within the design's capabilities), will be meat and drink to all those who want to recall those possibly happier days when the UK held a stronger, if diminishing, place in the world order. The fascinating text, which explains the economy-with-quality philosophy adopted and how A&P was the only yard that succeeded in achieving such an economic price, has been written by someone supremely qualified to comment.

John Lingwood will be well-known to readers of RINA's annual *Significant Ships* series as compiler of all 15 editions, the newest of which (2004) is due out this month. In his previous incarnation, John was chief estimator at Austin & Pickersgill and was in on the project at its birth. He recalls attending a very select meeting with managing director Ken Douglas when the idea was first mooted. A team of only seven or eight was asked to produce a formal tender in two weeks! It was the first time that the yard had considered series production of one design although the Southwick yard was well equipped for it.

From completion of the first example, *Nicola*, in February 1968, for General Freighters Corp (Mavroleon Brothers, who actually owned the yard through London & Overseas Freighters), the SD14 went from strength to strength. Some were built under licence, notably at the Compania Comercio & Navegacao (CCN) yard in Rio de Janeiro, Brazil, and although the design was billed as standard, there were many variants and extensions. These included liner types, also the larger SD15, SD18, and Prinasa-121, and even a little-known planned cargo/passenger version; nevertheless it was the basic SD14 in tramp form that achieved most fame.

Its profile, the adoption of straight lines wherever possible, with unattractive corrugated deckhouse sides, a bridge with three or five rectangular windows, straight-backed funnel, and union-purchase derrick outfit (what are derricks, today's naval architectural student may well ask?!) soon became a familiar face in ports worldwide. Several vessels were fitted with Velle patent swinging derricks, others with heavy-lift derricks, and others again with cranes. Later models featured a modified bow with a more vertical entrance. There is, of course, no such thing as a totally standard ship, and it is noteworthy that throughout the series, a total of 14 engine models were installed, although the Sulzer 5RD68 was the initial choice on the basis of simplicity and reliability.

The SD14 arrived at just the right time to cover the huge changes in shipping as the industry switched towards unitised (and especially containerised) cargoes and can be said to have been an unconditional success. The only sorry tailpiece to the whole story was the later closure of Austin & Pickersgill - and the advanced Sunderland Shipbuilders covered Pallion yard on the opposite bank of the river Wear - through political machinations by the then British Conservative government as a sop to the European Union - a move which some will never forgive. A&P had recently invested huge sums in new facilities to make it one of the most modern shipyards.

What technical lessons can be learnt from this historic series? Today's naval architects may find it a sobering thought that the complete design was created without computers (but working from previous hulls) by only two or three men in the yard design office, plus two estimators, in the total time of two weeks! The author told *The Naval Architect* that a later simple 26,000dwt bulk carrier, with the help of modern technology, took a year to finalise!

Those dreaming of replicating the SD14's success can take heart that multipurpose ships still have a role to play, as witnessed by the 26,000dwt/30,000dwt Rickmers, Columbia, and Chipolbrok ships very recently built in China at various yards (*Cape Darby, Significant Ships of 2001*). Perhaps the moral of this happy saga is that if you have the right design at the right time and price, success is already partly achieved. If today's shipbuilding costs continue to rise inexorably, then maybe 21st century versions of ships such as the SD14 will once again find a market.

---

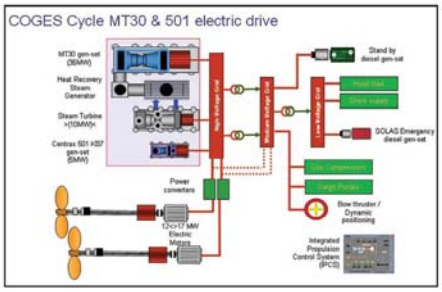
* *SD14: The Full Story*, by John Lingwood, MRINA. Published by Ships in Focus Publications, 18 Franklands, Longton, Preston PR4 5PD, UK. 256 pages. Hardback. £29.50 plus postage. ISBN 1 901703 64 9.

Rapid advances in LNG carrier orders and technology

SINCE we published our special supplement last September, *Design and Operation of Gas Carriers*, the bubbly world of LNG has moved further forward on several fronts. Bold pioneers are leading the industry into hitherto uncharted realms, where naval architectural and marine engineering skills will be taxed to the full. Probably the most significant of these vanguard advances involves the decision by a joint venture operation between US-based Overseas Shipbuilding Group (49.9%) and Qatar Gas Transport Co (50.1%) to order the first-ever really giant ships - of 216,000m³ capacity. Such designs have been discussed in this journal but this is the first time that they have become reality. It is not yet known which containment system has been chosen but it seems most likely that they will be of the membrane type.

These ships will also be notable in that they will be hauling gas under the QatarGas 2 project to a brand-new terminal to be built at Milford Haven in Wales (UK) over a period of 25 years. Total contract price is more than US$900 million. Further similar-sized designs (210,000m³) have been ordered by the German company Pronav at Daewoo (DSME) but at the time of going to press, details were not known. More contracts for ships up to 250,000m³ are expected to follow soon.

Apart from their size, major departures for the OSG hulls, two of which will be built by Hyundai Heavy Industries and two at Samsung, will be a choice of twin propellers and a decision to power them using slow-speed diesel engines solely burning heavy fuel, and with all cargo boil-off reliquefied. This is the first time ever that such technology has been specified, although details were fully discussed in our *Gas Carriers* supplement.



Waiting in the wings: proposed components of an optimum propulsion plant for a 200,000m³ LNG carrier with twin propellers, based on a Rolls-Royce MT30 gas turbine operating on a combined gas/steam/electric (COGES) cycle.

The engine design chosen for these titans will come from the MAN B&W stable and will be of the latest ME two-stroke type without camshafts and with electronic control of fuel injection. Each vessel will be installed with two 6S70ME-C models (2 x 18,660kW). MAN B&W's Holeby works will also supply four 7L32/40 auxiliary engines for alternator drive (4 x 3500kW) - an extra large electrical capacity will be needed for the reliquefaction compressors, which can absorb up to a huge 4MW (a possible detraction, according to some). This contract will certainly delight proponents of diesel technology for such ships, since it is more than 30 years since the dual-fuel *Venator* (with special Sulzer two-stroke machinery) went to sea. We shall have to wait for news of which propulsion machinery has been chosen for the Pronav series.

Reliquefaction plant will be supplied under a turnkey contract by Hamworthy Plc, which holds a worldwide licence for the Moss system (discussed in our *Gas Carriers* supplement, page 20). Hamworthy has a confirmed order for the OSG vessels and holds a letter of intent for the Pronav designs; total value is £48 million. This leading British company, which has been working for several years with top Korean shipbuilders and with oil majors (notably ExxonMobil) on this cutting-edge technology, holds options with Korean yards for a further 11 sets!

According to Lloyd's Register, up to 48 carriers of 200,000m³ and above will be needed for the QatarGas and RasGas projects alone, with a further 100 vessels of lesser dimensions for other projects. One spin-off anticipated in the wake of very large LNG ships is a new generation of floating docks specially ordered for pre-delivery inspection. As reported in our Samsung special supplement in June 2003, that Korean builder is already assembling FPSOs in a floating dock, and when the yard's new floating crane is complete, sections up to 3000tonne will be able to be lifted into it.

Another most significant contract in recent weeks has been that for four more dual-fuel-burning diesel-electric ships (plus four options) of the 155,000m³ class (more or less the maximum standard size today). These have also been placed in Korea, but this time by BP. The order has been split between Hyundai's Ulsan site, and at its associate yard, Samho Heavy Industries (formerly Halla), at Mokpo, which is a newcomer to the LNG sector. All four ships will be classed with Lloyd's Register.

Unsurprisingly, the machinery chosen to generate primary power on these new designs comes from the Wärtsilä stable. Each ship is to be installed with medium-speed engines: two 12-cylinder and two nine-cylinder engines of the 50DF dual-fuel type in each ship, with a total output of 39.9MW.

At the same time as all these exciting developments, tenders are believed to be out for a third alternative propulsion option: gas turbine-based machinery. Certainly, manufacturers are poised to strike, as explained in a special article elsewhere in this issue, and a contract in the LNG sector would be hailed as a critical landmark.

Great interest is also currently centring on ice-classed LNG tankers, partly for Sakhalin fields in the Russian Far East. An important factor is that Russia holds 31% of all known natural gas reserves, according to Lloyd's Register, with the largest fields in the Arctic region, under the Barents and Kara Seas. Sakhalin needs hulls strengthened for first-year ice but Arctic LNG carriers will need to be much stronger to deal with multi-year ice. However, current plans envisage gas first being piped to Murmansk where it will be liquefied for onward sea transport. This market, only likely to open up after 2010, could possibly - according to some - even see LNG tankers being built in Russia itself - an exciting prospect!

Meanwhile, on the membrane cargo containment front, industry observers believe that despite the time taken to accumulate the advanced skills in assembling containment modules, it is possible that some yards using the GTT NO96 concept may switch since the insulation thickness needed in greater than the Mk 3. Apart from GTT's new CS1 concept, other candidates are a new system being created and proposed by Korean Gas, also Ocean LNG's cylindrical tank (see page 4 of this issue), and the hitherto unknown prism concept of ConocoPhillips.

Despite all this positive activity for our industry, it is sobering to be reminded by some analysts that at the current rate of natural gas consumption, including 32% burned in the USA, reserves will only last for another 68 years!

Radical new approaches to lifesaving

HOW many naval architects can claim to have taken part in a lifeboat evacuation? We know that there is at least one out there who emerged ashen-faced from the experience of banging and crashing against the hull - and it was only a practice drop with a conventional boat. To his credit, that person was influenced enough to re-design the launch and descent mechanism on that particular ship, which he duly did.

This is, of course, another reason why all naval architects should spend some time at sea: a policy which The Royal Institution of Naval Architects and *The Naval Architect* have advocated on several occasions, but which is still largely ignored by the industry. This journal knows from our own experience in Norway of a training station launch in a free-fall lifeboat (certificate obtained to prove that we did it) what a difficult and slow operation it is - and those which back or neck problems were advised not to take part!

From discussions with those at the sharp end of inspecting lifeboats and their davit systems, there is clearly still much work still to be done to improve the design and operation of such equipment - disregarding the practical difficulties of persuading grandmothers and children to climb in. Some consolation can be gained from IMO's revised SOLAS regulations for the inspection and maintenance of lifesaving apparatus that are due to come into force in July 2006 but the fact remains that new thinking is needed on the design front.

A revolution in lifesaving: this vertically stowed Rescube proposal, today being re-examined in earnest by its creator, the Norwegian lifeboat manufacturer Norsafe, aims to allow people to walk straight into the boat from a fire-safe citadel zone on a ship. Thus, orderly evacuations should be possible in most scenarios.

We are pleased to report that brains have been at work, and a discussion on new davit ideas from a retired Norwegian sea captain, Egil Stag, appears on page 6 of this issue. Last month's Cruise & Ferry exhibition in London also enabled this journal to catch up on the newest advances in something much larger: the Rescube project, also from Norway. We reported on this design briefly in the past (June 2003, page 3), as part of an earlier discussion on this topic.

The Rescube - it has been on a back-burner for the last two years or so at the factory of its creator, Norsafe, based at Faervik, while more concentration took place in the offshore and cargo-ship sectors - is totally radical and includes something unique amongst its design attributes. This is that the designers believe - along with others - that the safest place in many emergencies is to remain onboard the ship itself: the citadel concept. Norsafe has also been seeking a solution beyond prescriptive regulations, which generally appear to being superseded today.

A Rescube is planned to be stowed in a large hull recess, inboard of which would a fire-safe cofferdam stretching across the hull to a similar recess on the opposite side of the hull. This feature would allow mustering to take place in an orderly and smooth fashion - the Evi simulation software developed by Safety at Sea at Glasgow/Strathclyde University (*The Naval Architect* June 2002, page 20) has been used by Norsafe to model evacuation scenarios.

One of the principal catalysts for the idea has been the large numbers of passengers and crew being loaded onto mega cruise liners such as Royal Caribbean's Voyager and Ultra-Voyager classes, also Cunard's *Queen Mary 2*. For example, passenger and crew capacities are approximately 3840/1180 for the Voyager class), and 4400 total on *Queen Mary 2*. At a slightly lower level, up 2700 passengers and 250 crew can sail on the brand-new cruise-ferry *Color Fantasy*. These are all very large numbers to muster in an emergency. In view of IMO's equal concerns over ships with large numbers of people onboard, it was appropriate that Norsafe took the trouble to present it latest ideas at IMO in February this year.

Rescubes are planned to be very large: each enclosed unit can load up to 330 people in three rotating modules (110 people in each), and entry is at up to six levels. Plenty of space would be available for standing as there is 1700mm of clear height above, and a number of pre-agreed seats could be removed so that there would be space for disabled passengers.

Norsafe is considering aircraft-type doors to seal the entrances after everyone is on board. Craft would be manufactured from GRP composites and mounted to comply with the maximum drop distance of 15m - a 1:4 scale model is currently being fabricated, and drop tests will be carried out. A propulsion plant able to automatically guide a launched Rescube 100m from an abandoned ship would be fitted.

An interesting innovation - hopefully to be thoroughly tested and proved foolproof - is the planned rotating mechanism of each module. Each of the three cylinders will rotate automatically through 90deg prior to a 35deg launch so that occupants will be in upright seating positions in the water. It is proposed that shipyards would simply provide the hull slot, and Norsafe would supply the boat and launch mechanism as a package. A hydraulic power pack would probably be needed to launch such a large weight.

Clearly, some naval architectural issues would be raised by the proposed recesses and the safe citadel zones, but these can be considered positive, not negative, aspects, and it is good to hear that the Norwegian Maritime Directorate has been most encouraging in its comments. An aim now is to find a shipyard and a shipowner bold enough to take this fascinating project forward - Norsafe says it is already talking to two leading passenger-ship companies, Alstom Marine and Carnival. Norsafe acknowledges that some extra cost will certainly be involved, up to 30%, depending on a ship design, but if a safer and more passenger- and crew-friendly ship results, then we should all be welcoming such an advance with open arms.

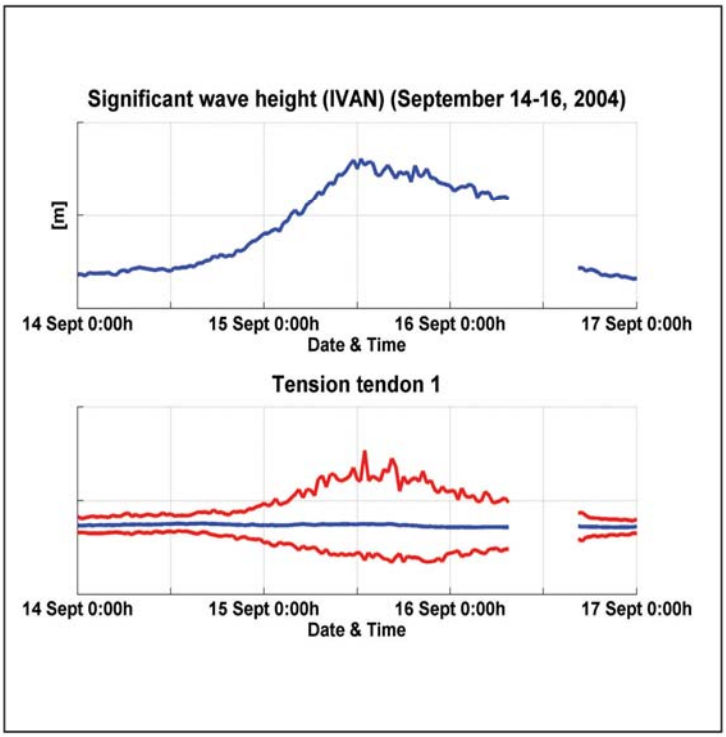
‘Ivan the Terrible’ captured on disk

The Marco Polo tension leg platform has been subject to an extensive monitoring campaign since June 2004. Here Johan Wichers and Pieter Aalberts, from MARIN, The Netherlands, track its progress.

MARCO Polo is installed in the Gulf of Mexico, 150miles south of New Orleans, in 1308m of water. Featuring a stable, four-column hull, the TLP is pre-tensioned to the ocean floor by 2 x 4 columns. Excluding deck steel, the platform payload is 11,500tonnes, at a displacement of 27,412tonnes.

In 2003, the owners GulfTerra and Caldive, awarded the instrumentation contract to MARIN T&M in a bid to collect data to resolve deep water issues in design, operation and inspection. Issues examined included the actual wind (hurricane), wave, and (loop) current, platform motions, tensions in tendons and risers, VIV behaviour, extreme loads, and the fatigue life.

Instrumentation comprises strains in the column tendon supports, loads, and vibrations of the tensioned risers, as well as high frequency and low frequency motions of the platform. Both to check the design input data and to gather sufficient data for analysing the platform behaviour, much attention was paid to wind, wave and current conditions. In total, 173 signals are continuously recorded with a high sample rate and stored for post-processing.



Data recorded as Hurricane Ivan passed the Marco Polo TLP.

The analysis of the data, to derive the dynamic behaviour of TLPs in operational and survival conditions and to verify design methods and numerical analysis, is the subject of a joint industry project. In this project, the partners in Marco Polo (GulfTerra, Anadarko, MODEC, and SEA Engineering) will cooperate with other operators interested in the optimisation of deep water operations and the extension to ultra deep water. This three-year project started in July.

Hurricane Ivan

In September last year, Hurricane Ivan passed the Gulf of Mexico resulting in the destruction of seven platforms and significant damage to 24 other units. The US Minerals Management Service (MMS) plans to award a contract for a technical study to examine the structural forces experienced by the oil and gas platforms during this hurricane. Ivan in fact, passed Marco Polo 120nm east of the platform. But it survived without damage and the monitoring system recorded the wind, waves and current profile, as well as motions, strains and riser and tendon dynamics.

The Marco Polo tension leg platform, located in the Gulf of Mexico.

The next issue of the eNewsletter of The Royal Institution of Naval Architects, U.A.E. Branch, will be published in late April/early May 2008. See you then.