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The AsiaLink-EAMARNET International Conference on Ship Design, Production & Operation

17 - 18 January 2007 Harbin China

The AsiaLink-EAMARNET International Conference on Ship Design, Production & Operation

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INNOVATION – THE KEY TO FUTURE SUCCESS

(Keynote speech)

Trevor Blakeley

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Chief Executive, Royal Institution of Naval Architects

INTRODUCTION

The international maritime industry is currently enjoying a prosperity which it has not known for some time, with the order books of many shipyards at record levels for recent times.

This industry boom is tied largely to three factors. Tougher environmental requirements by the International Maritime Organization are calling for the phase-out of single-hull tankers in 2010, and many ship owners want to build the double-hull ships which will eventually become the industry standard vessels, before the new rules come into force.

Another driver behind demand is China's hyper-growth economy and a big upswing in global commerce that is increasing seaborne trade between Asia and the West. With so much global trade transported at sea, shipowners are demanding the creation of larger container ships of up to 10,000 TEU capacity.

Then there is a surge the oil demand from developing countries such as China and India that has sent oil prices to record levels. This not only requires more tankers, but has also prompted a rise in the use of liquid natural gas. That, in turn, is sparking demand for LNG carriers. The global hunt for oil and gas is also leading to an increase in the need for new offshore oil production facilities.

It is perhaps understandable that, given the cyclic nature of the industry, the industry would wish to enjoy this success and consider as its major concern how to meet this demand and enjoy the benefits of this historic upturn in the industry's fortunes.

However, I believe that at such a time it is all the more important for all sectors of the industry to look ahead in order to respond to the future challenges it will face from the increasing demands of operators, regulators and society for greater efficiency, safety and the protection of the environment. I believe that this response will come, indeed, can only come from innovative thinking in all sectors of the industry. Such innovation will require commitment, investment and perhaps most importantly, people with the knowledge, understanding and skills needed by the industry of the future.

THE MARITIME INDUSTRY – GLOBAL – COMPETITIVE – DIVERSE – REGULATED

It is worth examining those key factors which will determine the nature of the maritime industry of the future, since it is that which will determine the challenges which the industry faces, and of course, it is the actions and decisions of today which will shape the industry of the future.

A global industry

First and foremost, the maritime industry is a global industry. This internationalism is reflected in all its sectors, whether it be research and development, design and construction, equipment supply, regulation and most obviously, in operations. This internationalism is also reflected in the knowledge, understanding and professional skills required by all these sectors.

A competitive industry

It is also a very competitive industry, in which capacity exceeds demand, with countries and countries seeking a competitive edge. When such a competitive edge may come from the ownership of intellectual property, that is knowledge, understanding and skills, it may be considered as inappropriate to share that asset. Whilst that may be true in part, I believe that it is primarily its use which provides that edge, and that it is in the wider interests of the industry to share such knowledge, understanding and skills. Also, the maritime industry it is itself in competition with other industries, as it seeks to attract the best people with the skills it needs into all sectors of the industry.

A diverse industry

The maritime industry is a diverse industry with many sectors, often with competing requirements and facing different demands. Whilst it is more usual to think of innovation in terms of technological advances, I believe that all sectors must respond to the demands placed upon them, both as a sector and on the industry as a whole.

Consider for example, the Queen Mary II. This is a magnificent vessel, incorporating much that is innovative and state of the art. However, the QMII is not just a cruise ship, reflecting the owners response to an increasing demand in this market sector, but also demonstrates innovative thinking on the part of the shipowner. For indeed, the QMII is not a cruise ship but a passenger liner, designed and built to be able to operate a scheduled crossing of the North Atlantic at any time of the year, thereby expanding this sector of the market. Such innovation comes at a price of course. For example, the flare of the bow, necessary to operate at speed in such conditions as may be experienced in the North Atlantic in winter means a loss of cabin space. The cost of such innovation is a 30% increase in the overall cost of construction.

A highly regulated industry

It is also a highly regulated industry, affecting designers, builders and operators alike. Unlike the rest of the maritime industry, the regulatory sector does not seem to ever experience a downturn. This should not be surprising, given society's increasing awareness and sensitivity to the safety of both people and the environment. However, I believe that innovative thinking is also required in both in the framing of and the response to such regulation. Such innovation is reflected in the introduction of goal based standards as a means of ensuring that such regulation is effective whilst causing minimum impact on the efficiency and prosperity of the industry. Innovative thinking by Classification societies has put them on the verge of entering into a new area of risk based rules where the use of systematic risk and safety assessment provides a more holistic perspective on safety regulations at sea.

An industry of extremes

The maritime industry is also an industry of extremes of development, with companies and countries whose industries are technologically advanced, but whose labour costs reflect their advanced economies. For such countries, the competitive edge is in the high value, complex ship. At the other extreme are those countries whose industries are still developing, but who, for the moment, enjoy the competitive benefit of low labour costs. However, both share the challenge of how to maintain their competitive edge in a changing global market.

I referred earlier to the key factors which define the industry. One of those is the current imbalance between supply and demand, between East and West, reflected in the contrast between the European and Chinese industries.

Measured in traditional shipping terms (CGT), Europe has about 15 per cent share of the worldwide commercial shipbuilding new orders. If measured in dollar revenues, Europe actually has a 30 % share of the world market.

Europe constructs more sophisticated vessels with higher value: for example cruise ships, which are on average 10 times more costly and sophisticated than tankers. Europe is the leader in this market and also holds a strong position in the equally sophisticated naval market.

To continue to benefit from this positive trend the European shipbuilding industry must recognise the need to increase its efficiency within its current major constraints: that is one-of-a-kind production and relatively high labour costs.

The challenge for Europe is the competition from Asia, and especially China, where a key dynamic is production versus manpower. Over the past 20 years production in the European shipbuilding industry has increased by more than 40 percent, while manpower has shrunk by over 35percent. This trend is almost entirely technology-driven and will need to continue.

Europe is also developing a more collaborative, multi-party and joint venture-orientated industry, in which the mobility of manpower and knowledge will be a vital factor.

China has embarked upon a major programme of expansion, in both capacity and capability and is currently ranked third in terms of its market share. New yards have modernised and increased production capacity. The launch in late 2005 of China's first domestically built liquefied natural gas (LNG) carrier ship marked a significant upgrade of the country's shipbuilding capability. This was achieved after an extensive period of knowledge transfer over several years.

Despite these advances, most observers conclude that the Chinese shipbuilding industry still has some way to go to reach the technological and manufacturing levels of its international rivals. Most of the naval hardware being produced is at least one or two generations behind their counterparts in the West. Chinese shipbuilders are also estimated to be 5 to 20 times less efficient and profitable than Japanese and South Korean shipyards. Tan Zuojan, Vice President of CSSC recently outlined a detailed vision for CSSC in the coming half-decade. This included increased efforts to construct a new shipbuilding base; adjusting the product mix; greater use of science

and technology; enhancing overall competitiveness; and pursuing additional foreign linkages, productive as well as financial. The need for knowledge transfer is central to achieving this vision.

A highly technological industry

The maritime industry is a highly technological industry, and it is therefore in technological and scientific development that innovation will have perhaps the greatest impact, in providing ships and marine structures which cost less to design, build and operate, are safer, and more sensitive to the environment. I will not attempt to predict what such advances will be – that is the function of conferences such as this. However, I believe that there are two particular issues which the industry will have to face, and which technological innovation must address. These are the environment and changes in shipbuilding.

CHALLENGES

The environment

A number of the challenges faced by the maritime industry relate to the environment. Studies consistently show that shipping is the most environment friendly transport mode. Despite this, the industry still faces several challenges with regard to the external environment. Air pollution, ballast water and the disposal of marine vessels and structures are examples that need to be addressed.

It is clear that more efforts will have to be made on reducing the impact of air emissions, both by measures to further reduce Nitrogen Oxides and Sulphur, and by reducing fuel consumption through increased efficiency by the optimisation of hull and propeller design.

Another environmental challenge facing the shipping industry is ballast water as global climate changes effect the spread of alien species. This and air pollution are good examples of where an international approach to find an overall environmental regime for the long term will be of the greatest benefit to the industry.

The maritime industry will also be required to contribute further towards the aim of maintaining a sustainable environment, particularly in the way in which it uses resources. The industry must address the challenge of how to dispose of ships and structures, safely and economically with the minimum detriment to an increasingly fragile environment. Increasingly, the industry will have to adopt a through life approach to such a requirement, accepting that recycling begins on the drawing board, and continues throughout a vessel's construction and its operational life. It must be recognised that designers, builders, owners and regulators all have a responsibility and role to play in achieving this.

These and other environmental issues will increasingly impact on the industry, requiring all sectors to contribute to providing innovative solutions the problem.

Shipbuilding

The shipbuilding sector of the maritime industry faces increasing competition, both internally as capacity and access to the market increases, and externally for increasingly scarce resources, both material and particularly manpower. The challenge it faces is how to respond to the demand for lower cost ownership. The past discrete improvements in efficiency are not enough: it must now apply innovative thinking to the whole design and construction process to improve productivity and cost-competitiveness. The next generation of emerging shipbuilding technology, based on data-centric and rule-driven software solutions, must be used to support and facilitate the revision of working processes in order to streamline shipbuilding design and construction, preserve existing data and make it re-usable for future projects.

This is not just a matter of introducing more efficient equipment or advanced IT, but of using such technology within a single integrated environment to support flexible ship design, production, and life cycle management. The aim must be for a truly multidisciplinary environment where all designs are fully visible to all parties; where the design tasks are made simpler and faster for the user; and where manual rework and checking are eliminated. Its potential to provide ship designers and builders as well as operators better decision support must be fully utilised. It must also be used to enable ship designers, shipyards, subcontractors and suppliers, authorities, and others to manage and execute projects across company borders, cutting costs and shortening project schedules. All this will require innovative thinking by all parts of the shipbuilding industry.

RESEARCH AND DEVELOPMENT

How will such innovation in technology come about? Firstly, and self evidently, it will come from research and development which will require both commitment and investment.

Investment

I am not qualified to comment on whether the level of current investment in research and development is sufficient, although historically the investment record of the maritime industry does not stand too close a scrutiny. Perhaps a more pertinent question is whether such investment has been effective and efficient - has it

given value for money? Again I would not wish to pass judgment, but I believe that this will only be achieved if there is close cooperation between those sectors of the industry requiring, and therefore generally funding such R&D, and those engaged in such activities, whether in research institutes or universities. Such dialogue is essential if technology is to provide the innovative solutions to the challenges face by the industry. I believe that there is the potential for increased co-operation between the maritime industry, universities and research institutes. Too many research and development projects result in increased knowledge among a selected few, but do not result in new products or processes. Innovative thinking is wasted if the ideas cannot be brought to the marketplace.

People

Secondly, and perhaps most importantly, such innovation will come from people who have the necessary knowledge, understanding and professional skills. This too will require investment. But where are such people to come from? It is the role of universities to provide the knowledge and understanding which underpin the professional skills which industry requires. But what are those skills which industry needs now, and more importantly, in the future, given that it takes 4 or 5 years of academic study before the graduate enters industry. Industry must identify those changing needs so that universities can respond to them, through close cooperation.

If the maritime industry is to compete with other industries for the best engineers, it must also demonstrate that it provides a challenging and rewarding career. That is a task for all sectors of the maritime industry. I also believe that the maritime industry must be more prepared to use the common knowledge and skills which exist in other industries.

Professional development, that is the updating and developing of new skills, and the widening of experience is a life time activity. Essential to that activity is access to up to date information on developments in the maritime industry. Organisations such the Euro-Asian Maritime Network (EAMARNET) and professional societies such as my own have an important role to play in providing the opportunity for such access.

The Royal Institution of Naval Architects was founded in 1860, with the aim of improving the art and science of ship design, and that aim remains equally valid today. Today, the Institution acts as a focus between the individual engineer, universities, industry, and maritime organisations. It achieves this through its membership in over 90 countries, reflecting the global nature of the maritime industry, and thought its links with other national and international organizations such as the International Maritime Organisation. It sets the highest standards of professional competence and integrity in its requirements for membership, and it promotes and facilitates the exchange of technical information through its international publications and conferences. Such high standards of professional competence are essential if the maritime industry is to respond to the challenges it faces in the future. But of course this implies a willingness to provide such information, that is the transfer knowledge from those that have it to those who do not. Conferences such as this have a vital role to play in that process.

SUMMARY

In summary, I believe that the future success of the maritime industry will require a willingness of all sectors of the industry - designers, builders, regulators, shipowners - to seek and embrace innovative solutions.

This will require well directed investment in the research and development necessary to provide technological solutions to the challenges facing the industry.

It will also require a willingness to share information which will benefit the industry as a whole, balancing competitive edge with the open transfer of knowledge.

Finally, and perhaps most importantly, the future success of the maritime industry will require people of the highest quality, whose education and professional development has given them the necessary knowledge, understanding and professional skills to provide the necessary innovative solutions.

I would therefore suggest that whilst that whilst innovation is the key to success, people are the key to innovation.

The AsiaLink-EAMARNET International Conference on Ship Design, Production & Operation

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