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DIRECTORATE FOR SCIENCE, TECHNOLOGY AND INDUSTRY

AVAILABILITY AND TRAINING OF SEAFARERS

Prepared for the OECD Maritime Transport Committee

by

Precious Associates Limited

January 2003

This report has been prepared for the MTC and is being made available to a wider audience.

Organisation for Economic Co-operation and Development
Organisation de Coopération et de Développement Economiques

PRECIOUS ASSOCIATES LIMITED PAL

OECD PROJECT

THE AVAILABILITY AND TRAINING OF SEAFARERS - FUTURE IMPACT

Prepared by:

Precious Associates Limited

In association with:

Knightsmart Limited

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REFERENCES

Within the Report, a number of abbreviations, acronyms, and other shortened titles, are used. Full details now follow:

BIMCO	Baltic and International Maritime Council
EEA	European Economic Area
ECSA	European Community Shipowners' Associations
EU	European Union
ICS	International Chamber of Shipping
ILO	International Labour Organization
IMO	International Maritime Organization
ISF	International Shipping Federation
ISM	International Safety Management Code
ISPS	International Ship and Port Facilities Security Code
ITF	International Transport Workers' Federation
KNIGHTSMART	Knightsmart Limited
MASSOP	Management Structures of Shipowners' and Operators
NUMAST	National Union of Marine Aviation and Shipping Transport Officers
PAL	Precious Associates Limited
P&I	Protection and Indemnity Clubs
OECD	Organisation for Economic Co-operation and Development
STCW	International Convention on Standards and Training, Certification and Watchkeeping for Seafarers

1.   INTRODUCTION AND OBJECTIVES

The Maritime Transport Committee of the Organisation for Economic Co-operation and Development (OECD) has sought consultancy services to undertake a Future Impact Study of the Availability and Training of Seafarers.

The prime objective set for the study is to examine the impact of future developments in ship design and construction, technology and management and operational practice on the demand for ships' crews, both in terms of numbers and skill levels. The study is also to examine the effect that a shortage of OECD seafarers would have on the operation of national fleets and associated shore based positions.

The Consultants developed a two-stage approach which ran concurrently throughout the four month period of the study and focussed on the five individual elements detailed in the OECD framework when the task was outlined. The <u>theoretical</u> stage has covered desk top research with extensive investigations, primarily through the internet, and sourced all recent and current data applicable to the Terms of Reference. The <u>practical</u> stage, which has been more intensive, was directed at obtaining views and opinions, through a series of questionnaires, from all sections of the marine industry (primarily where there is an OECD impact) including, but not restricted to, ship owners / managers, ship builders and designers, training colleges, seafarer unions, marine bodies in the shore industry and, finally, seafarers themselves. Both theoretical and practical outcomes are featured in this Report.

The Consultants are pleased to have been selected and have been encouraged by the level of interest shown in the review, both through discussions and, more importantly, by the wide ranging input from nearly all OECD member countries.

The consultancy team brought together the resources of Precious Associates Limited (PAL) and Knightsmart Limited (Knightsmart), this joint team providing a good balance of marine personnel / human resources experience and ship management and training in the marine industry.

The consultants have used their best endeavours to provide an accurate analysis of the appropriate data and also to use an imaginative approach when reporting on the future position, which is supported by a series of recommendations. However, they cannot be held liable for any decisions that may be made based on this study.

A special appreciation is extended, by the Consultants, to the many respondents (more than 100) who have provided valuable input into this study.

When permission is received from the OECD, shared relevant information will be passed back to these respondents.

2.   EXECUTIVE SUMMARY

2.1   The prime objective of this study is to evaluate how recent developments in ship technology and management practises have impacted, and will continue to impact, on maritime crewing and training, in OECD countries, both ashore and at sea, over the next five to ten years.

2.2   The study has addressed, both individually and collectively, the 30 OECD countries which share a commitment to democratic government and the market economy. All these countries, as shown in the study, have a marine interest, whether in the registration of vessels or in related shore based operations. Every effort has been made, by the Consultants, to look as widely as possible across all the OECD member nations.

2.3   The study has been carried out over a four-month period, by a Consultancy team embracing expertise in marine personnel, ship management and training - all related to the shipping industry. The programme of work has incorporated a combination of desk top research, which has investigated the OECD countries and their marine infrastructures, complemented by views and opinions obtained from all sections of the industry having an impact on ships, seafarers and relevant supporting shore organisations. This latter input, considered essential to the topicality of the study, was gathered through a series of specially designed questionnaires, issued to different focal points, but all with a common marine theme - in effect, what does the future hold for OECD seafarers and the industry as a whole?

Responses to these questionnaires have provided valuable input to the study, particularly as regards the human resource element, with information having been gathered from a cross section of separate companies / organisations and, in addition, seafarer opinions from six different OECD nationalities have been received. In all, responses from 22 of the 30 OECD countries have been received - some, naturally, in greater detail than others.

2.4   The prime data, gathered and collated for the study, shows:

- OECD member countries, in 2000 (the latest figures available), have a total of 14,948 vessels under their registers, this being some 30% of the world's commercial trading fleet over 100gt.

- When second register vessels of OECD members are included, the fleet total rises to 17,924 vessels, representing 34% of the world's commercial fleet.

- The total number of shore based companies and organisations in the shipping industry, in OECD countries, is 34,683 - whilst the relative figure for the world is 53,143. The OECD proportion is thus 65% of the global figure. Companies and organisations, for this purpose, include, amongst many others, ports, ship owners / operators, ship builders, equipment manufacturers, classification societies and colleges.

- The number of OECD seafarers (as individually reported in the BIMCO / ISF 2000 Manpower Update) is 165,000 Officers and 216,000 Ratings, which respectively represented, at that time, 40% and 26% of the global labour market.

- Thus, the marine influence of the OECD, when measured against world figures, whether considering the number of ships, shore based organisations or seafarers, is significant, in fact, almost dominant.

2.5   The main study is reported under three separate, but linked, chapters:

- The Technical Review
- The People Review, including the Seafarer Perspective
- The Training Review

The main outcomes of each now follow.

2.6   The **Technical Review**, based on research and questionnaire results shows:

- Although world ship numbers (including OECD controlled vessels) are predicted to increase from 46,518 in 2000 to 51,384 in the next five to ten years, over two thirds of the fleet will be the same ships that are trading today.

- OECD ship owners / managers, collectively, have a greater proportionate role in sophisticated vessel operation, than the rest of the world - the key figures being:

Passenger ferries	56%
Offshore support	37%
Tankers (all types)	31%
Dry cargo	23%

  All percentages are relative to the applicable world fleet sector figure.

- Of the 14,000 global companies who are involved with ship building, engine and marine equipment, 75% are located in OECD countries. These companies are in the forefront of innovation and design.

- The design, size and speed of ships over the next five to ten years are likely to remain the same, except for container ships, cruise liners and ferries, which are predicted to be even larger. There will also be an increase in the numbers of high-speed craft, especially on coastal ferry routes.

- Subject to the caveat of single hull tankers, it is envisaged other vessel types will trade longer than before.

- Ships that have been delivered over the past decade are designed and built to carry complex and technically demanding equipment, with a greater diversity of ship type, than ever before. The next five to ten years sees no radical changes in the type of equipment carried.

- Specific technical developments relate to more cost efficient vessels, with a focus on fuel efficiency, greater reliability and decreased maintenance.

- The industry is heavily regulated and there is no evidence this will change. Known future legislation will focus on vessel security, the environment and seafarer conditions.

- Economic conditions in the future may include an extension of tonnage tax, modification of cabotage and greater opportunities for short sea and inland water transport, particularly in Europe (as an alternative to land movement of goods).

- Increasing IT technology will impact in such areas as vessel monitoring, information and communications. Management of ships and ship / shore relationships will become more computer linked. Seafarers will have a prominent role in data entry.

In summary, ships and their operation will change little over the next five to ten years.

2.7   The **People Review**, primarily based on questionnaire results, but also with supporting research, shows:

- Of the survey companies, 36% of the seafarers in total are OECD nationals - this figure being similar to the Officer number in the BIMCO / ISF Report.

- OECD senior Officers comprise 57% of the total senior Officers of all nationalities employed by OECD owners / managers, with the relative junior Officer figure being 43% and the Rating figure only 25%.

- Crew sizes for current trading vessels, which have marginally decreased over the past ten years, are expected to remain broadly the same for ships in service. Ship design may enable some further small reductions in new building vessel complements, but with no evidence of predicted dramatic changes. Reasons for stability in crew numbers relate to a number of factors - eg legislation, social and economic, etc.

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- The future (up to ten years) demand for OECD Officers is expected to remain broadly constant, although there are signs of a falling off in the future requirement for OECD junior Officers. Rating numbers will continue to decline.

- Drawbacks to the employment of OECD seafaring personnel are principally reported as cost related, closely followed by lack of availability.

- In wage terms, the employment costs of OECD seafarers are expensive, when compared to other major seafarer supply centres – eg a typical monthly wage cost for a Master from Croatia, India, The Philippines and Russia is between $4200 and $6300. By contrast, a typical monthly wage cost for a Master from such countries as Denmark, France, Germany, Japan, Norway and the UK is not less than $8500 (and may be as much as $11000).

- In an open market (with no constraints) there would be, by owners / managers, almost total choice for OECD Officers, the prime reasons given relating to skill levels, competence and quality. OECD Ratings, by contrast, are not so popular a choice (in an open market).

- 73% of companies are currently training new entrant OECD seafarers, for both sea and shore based positions - 17% of companies are training as part of a tonnage tax regime.

- OECD Officers, particularly in the senior ranks, are an ageing workforce.

- Shore based companies report that almost half of their fleet management staff are former OECD seafarers, with this figure expected to largely remain constant over the next decade.

- Respondents report, emphatically, that successful shore based management requires ex seafaring personnel, with almost 100% of respondents requiring former seafarers in fleet management.

In summary, it appears that there is a preference for OECD seafarers who, in relative terms, are an ageing and comparatively expensive work force.

Note: The biggest obstacle to international / OECD analysis of seafarer numbers is the paucity of reliable national statistics.

The **Seafarer (primarily Officers) Perspective** shows:

- 70% of respondents report that their training and experience has prepared them for a career ashore within the marine industry.

- Similarly, 80%, if coming ashore in the future, would like their career to continue within the marine industry.

- 88% believe their career has followed their expectations.

- Three quarters believe that the status and image of a seafaring career must be improved.

- 60% of Officers (and 77% of Ratings) consider that the training of seafarers in their country is inadequate. Management practises and engineering knowledge are reported as those areas where extra skills are required.

- 85% of seafarers believe that ships should continue to be manned in the standard format of deck, engine and catering departments. Similarly, 100% believe that the on board structure of Officers and Ratings should continue.

- Three quarters of seafarers believe it should be possible to plan and develop a long term marine career, which embraces both sea service and shore based employment.

- The main attractions of a seagoing career are seen as pay and conditions, job satisfaction independence and attractive career prospects.

- The drawbacks of a seagoing career are seen as the poor image, little / no job security, limited social life and lack of recognition from shore management.

- The impact of IT is seen both positively and negatively - eg greater communications, but (on occasions) increased pressure from shore organisations.

In summary, seafaring would benefit from an enhanced industry image, thereby helping to ensure sufficient numbers of new trainees for the future.

2.8   The **<u>Training Review</u>**, principally based on research and responses from the questionnaires, shows:

- There is an emphasis on safety training by international organisations, training establishments and shipping companies.

- There is a perception amongst most sectors of the industry that training of seafarers is inappropriate for the present, let alone the future.

- There is still a high demand, for seafarers today, to have basic practical skills – in general, these are reported as missing, and not provided by colleges; in effect, there is too great an emphasis on theoretical knowledge.

- There appears to be a lack of co-operation and communication between training establishments and the wider shipping industry to identify new technologies, commercial problems, etc.

- Insufficient training is given in knowledge related to new equipment and technology. Vessels today are increasingly sophisticated but with seafarers having limited technical understanding.

- 70% of respondent colleges / training establishments provide STCW short courses and simulator training, with 60% providing Cadet training.

- Owners / operators and shore based employers report a lack of management and IT skills amongst serving and ex serving Officers today.

- Prior to seafarers coming ashore, there is a paucity of relevant outside training courses available - this being compounded by the stated requirement that such training needs will significantly increase over the next decade.

- More than three quarters of marine college training staff in OECD countries are ex seafarers, the great majority being OECD nationals. There appears to be no provision to replace them in light of the decreased numbers of seagoing personnel.

- Shore based marine organisations, such as law firms, surveyors, P&I Clubs, etc confirm they ideally require ex mariners in significant numbers and from whatever source, to fill key roles. Increasingly, the numbers of OECD seafarers being attracted to shore jobs is declining, especially in Superintendent type roles - reasons given relate to the perceived disadvantages of a shore position – eg reduced leave, less formalised time at home (with the family) and, in a number of cases, a lower salary combined with a loss of tax benefit.

  In the event that OECD seafarers are unavailable, then non OECD personnel will be recruited - this is a very clear message.

- It appears quite clear that a number of shore based bodies do not support, either financially or in any other way, marine training to the industry - ie they rely on the supply of marine personnel expertise from other sources.

In summary, present day training and development of seafarers, in areas other than safety (including STCW), needs to be reviewed.

Note: Numerous national, international and industry studies have and are being undertaken, all related to the shortage of personnel entering and remaining in the shipping industry.

2.9   **Conclusions**

⇒ Over the next five to ten years. two thirds of the expanding world fleet will still be the same ships as trade at present, with the same basic crew numbers, technology and design.

⇒ New ship buildings will, on the whole, have similar technology and design as produced over the last decade. A very small percentage of these ships will be larger, faster and increasingly high tech – all requiring greater knowledge and training, but still with a need for practical marine skills.

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⇒ Legislation will continue to impact, as will environmental issues and public awareness of the perceived shortcomings of the industry - eg media coverage.

⇒ Present day training and development of seafarers, in areas other than safety, needs to be reviewed.

⇒ In future, better information and figures will be made available through the control of STCW '95 certificates.

⇒ There is no evidence to suggest a declining demand for, primarily, OECD senior Officers, although requirements for junior Officers and Ratings are predicted to fall. Of concern, is the ageing population of OECD seafarers which, unless younger OECD intakes are permitted to develop their on board careers, may result in a corresponding number of jobs being filled by, mainly, central and east European Officers.

A potential risk in this situation is that, should the replacement supply (which will, invariably, be cheaper than their OECD counterparts) be found to be satisfactory, then the future requirement for OECD seafarers may be jeopardised.

⇒ Tonnage tax legislation, related to manpower, could possibly result in greater numbers of trainees.

⇒ Increasing numbers of shore marine positions will be filled by other than ex seafarers - this may include graduates, naval personnel and direct entrants, and their relevant training needs must be reviewed.

2.10   Suggestions

The OECD is, today, in a position of some significance in the global marine industry. Some of the suggestions below could be said to apply to the worldwide marine industry - where the OECD leads, the rest of the world may follow.

⇒ Government support measures, for the marine industry (such as training incentives, tonnage tax, etc) should be extended to those countries where these are not in place. There is firm evidence to show that success can be achieved through increased ship registration numbers and new recruits.

⇒ A marine career needs to be developed to ensure the attractiveness of the industry - the image of working in a marine environment, whether at sea or ashore, must be improved and greater encouragement should be given to female entrants to the industry. Additionally, a study should be undertaken to assess the roles of seagoing and shore based personnel in non-safety areas.

⇒ The role of the seafarer needs to be enhanced, through greater recognition, improved training and increased management responsibility on board (decentralisation).

⇒ Wherever possible, there should be greater harmonisation of training, so that standard training is in place - especially for shore preparation, management skills, etc – both at sea and ashore, etc.

⇒ Closer co-operation should be encouraged between training institutions and the commercial side of shipping, manufacturers, shore based employers, etc. In particular, Nautical training establishments should be encouraged to develop greater collaboration between themselves.

⇒ Consideration should be given to initiating closer co-ordination / co-operation with the plethora of studies, relating to seafarers and their future, that are being conducted in other areas, such as the EU and globally.

⇒ If there is a perceived need to retain the level of OECD Officers on OECD (and other) vessels, more should be made of the Rating to Officer training schemes - OECD may wish to take the initiative in this respect.

3.   NARRATIVE

3.1   INTRODUCTION

This section is concerned with the overall review of the project and attempts to set the scene for the outcomes which will be found in the following parts; the Technical Review, the People Review and the Training Review. The aim is to reference all those features which, to a greater or lesser extent, may impact on the Terms of Reference, under the broad heading "The Availability and Training of Seafarers - Future Impact".

Within the narrative section, the following areas are addressed:

- Background and methodology
- The OECD
- The historical perspective of the industry
- The influencing groups
- The constraints to the study

3.2   BACKGROUND AND METHODOLOGY

The consultancy team was appointed by the OECD's Maritime Transport Committee, in early August, to evaluate how recent developments in ship technology and management practices have impacted on maritime crewing and training, both ashore and at sea. The programme of work, adopted by the consultants, has been along the following lines:

- Desk top research into all aspects of the OECD maritime community - this included data on fleets, manpower, marine infrastructure, training, current developments, legislative measures and other associated material. This research was primarily country based but, whenever possible, considered cross community details, which may extend over a number of the OECD member states.

- A series of meetings and interviews with marine related bodies and individuals all of which, it was felt, would be able to add value to the consultant's work. Worthy of particular mention are:

  ➡ Visits to two ship owners / ship managers, currently associated with OECD personnel.

  ➡ Attendance at the ISF 2002 Manning and Training Conference in London, on 11th September 2002.

  ➡ Part hosting an exhibition stand at the Maritime London Exhibition at the Baltic Exchange, on 3rd October 2002.

  ➡ Discussions and debate with a series of international ship owners and ship managers.

  ➡ Ship visit in the London river, on 15th October 2002.

  ➡ An extensive programme of phone conversations with training colleges, shore related marine bodies, seafaring unions and high profile shipping personalities.

- Creation of seven questionnaires, specially prepared for this study, all directed at separate industry focus groups which, it was considered, would add value to the assignment. In summary, these questionnaires, which are included as appendices, at the end of this Report, are:

  1. **The Main Questionnaire**

     This was sent to about 250 ship owners / ship managers, in OECD countries and an 18% response was received from 18 different countries.

2. **The Technical Questionnaire**

   Approximately 200 of these were despatched, broadly to the same grouping as above, with a 16% response rate.

3. **The Shipbuilding Questionnaire**

   A total of 37 were issued, with a 14% response rate - this concentrated on the shipbuilding community.

4. **The College Questionnaire**

   This was developed once the first set of replies were received from questionnaires 2 and 3 and was addressed to 30 colleges / training institutions, all in OECD countries.

5. **Seafarer / Union Questionnaire**

   This was developed to accommodate the ship visit and, subsequently, sent to a wider audience of deep sea operators. Replies were received, covering six nationalities and including both Officers and Ratings.

6. **The Ship Owners' Organisations Questionnaire**

   This was targeted at the representative bodies of the ship owners - the despatch numbered some 15, with a one third response rate.

7. **Marine Shore Groups Questionnaire**

   Finally, it was important to elicit news from the shore based community - 33 were despatched to as wide a variety as possible of organisations / bodies where it is believed former (OECD) seafarers are now working.

Overall, the response rate to the questionnaires is believed to be entirely acceptable and, of special significance, are the numerous free writing comments - the reading of these is recommended.

- Throughout the four month period, regular meetings took place between the consultants, with a high focus of attention on target dates / questionnaire return / progress monitoring and the like.

- Finally, and in accordance with the contract, an Interim Report was submitted to the OECD Maritime Transport Committee, in October 2002.

3.3   THE OECD

For the purposes of this study, the OECD is an international organisation which brings together 30 countries, sharing a commitment to democratic government and the market economy. All OECD countries, to a greater or lesser extent, have a maritime infrastructure which is supported, in turn, by national seafarers and, in the majority of cases, by national flag vessels. The full list of OECD countries is:

Australia	Hungary	Norway,
Austria	Iceland	Poland
Belgium	Ireland	Portugal
Canada	Italy	Slovak Republic
Czech Republic	Japan	Spain
Denmark	Korea	Sweden
Finland	Luxembourg	Switzerland
France	Mexico	Turkey
Germany	Netherlands	United Kingdom
Greece	New Zealand	United States

It is encouraging to report that 22 of the 30 countries have provided input to the study and, of the eight where there has been no direct response, the majority of these, in shipping terms, are only small players.

3.4   THE HISTORICAL PERSPECTIVE OF THE INDUSTRY

With a view to understanding where the shipping industry is today, a few historical notes follow:

⇒ International shipping has been through phases of considerable change during the last fifty years. In the middle of the twentieth century, there was a period of stability and growth, with the industry being dominated by large, integrated, international Companies, many being well known household names. The shipping Companies, a considerable number of whom were based in OECD countries, were all-embracing; owner, charterer, ship's husband, employer of staff and provider of finance.

⇒ The shipping slump of the 1960s and 1970s saw many of these larger Companies either closed or substantially contracted. Banks and finance houses were required to write off loans, and thousands of professional seafarers left the industry, many of them through redundancy.

⇒ The greatest impact of this change took place in advanced nations, such as North America, Australia, Japan and Western Europe, with the result that seafaring employment underwent a gradual move to the Far East, primarily Ratings. Reasons for the change were twofold:

  • Initially being dictated by cost constraints and, in many cases, the need for survival.

  • The increasing non-availability of, primarily, West European seafarers, who were traditionally regarded as the main seafaring groups.

⇒ During the 1970s and 1980s, the "flagging out" phase took place, with many owners switching their vessels' registry to bases such as Liberia, Panama, Bahamas and Bermuda and, at the same time, considerably increasing their offtake of Far Eastern seafarers. This also coincided with the start of a move to third party ship management, a trend that continues today.

⇒ More recently, in the last ten years or so, the international maritime manpower industry has continued to experience significant change, but not major upheaval. Simply put, the manning industry today still has a high proportion of West European OECD personnel, mainly Officers, in the senior on board positions, but with other larger groups of seafarers being recruited from the Far East, and increasing numbers from Eastern / Central Europe.

3.5   THE INDUSTRY TODAY

At present, the international maritime scene is, by and large, in a state of comparative calm. However, there are considerations, at the time of preparing this Report, which need to be recorded:

• Terrorism - Regrettably, is to the fore. Shipping has not escaped, with the attack on the VLCC in Yemen.

• Legislation - The past few years have seen a high spate of legislative measures with a focus on STCW '95, the ISM Code and, now, ISPS. The latter, the International Ship and Port Facilities Security Code is being considered, now, at the IMO and will impact on many aspects of the shipping community.

• Economic - There continues to be concern over the global economic picture which, at best, is in a state of uncertainty and, at worst, is heading towards recession. Shipping Company financial returns, this year, have been mainly negative.

• Image - Once again, and particularly in Europe, the industry is under focus, with the sinking of the "Prestige" and the consequent impact on the environment. This is uppermost in the public eye at present - political analysts, once again, bring into question the industry's ability to regulate itself.

3.6   THE INFLUENCING GROUPS

Relative to the shipping industry at large, and specifically to this study, the key groups of bodies / organisations are believed to be:

⇒ **Ship Owners / Operators**

As has been the case, traditionally, ship owners remain the largest group involved with the industry and, as regards OECD countries, Japan is the largest, followed by Greece, United States and Norway.

⇒ **Ship Managers**

This group may be contracted by an owner or a bank to carry out traditional shipping functions, ranging through manning, management, commercial, etc. Ship managers, whilst global in their coverage of services, tend to be concentrated in the following areas:

- North West Europe - eg Norway, UK (including Isle of Man) (OECD countries)
- Mediterranean - prominent in Greece and Cyprus (some OECD countries)
- Hong Kong and Singapore
- Middle East - particularly Dubai
- Other pockets such as Australia, United States and small numbers (embracing OECD countries)

Note: The ship management sector is currently estimated to control 25% of the world fleet, this being up from 20% in 1990. It is expected to reach 33% by 2010. (Lloyd's List 27th September 2001)

⇒ **Manning Agents**

Manning agents are the group associated with the supply of marine personnel and are based in the country of recruitment from which the seafarer is drawn. Increasingly, they are based in the Far East and India and, more recently, Eastern Europe.

⇒ **Ship Builders / Equipment Manufacturers**

By far the largest percentage (around 70%) of ship builders and equipment manufacturers are located within OECD countries, together with associated research bodies.

⇒ **International Regulatory Bodies**

These will include the International Maritime Organization (IMO), International Labour Organization (ILO), Port State Control, etc.

⇒ **Other International Bodies**

These will include classification societies, the Baltic and International Maritime Council (BIMCO), the International Shipping Federation (ISF), the International Chamber of Shipping (ICS), the Organisation for Economic Co-operation and Development (OECD), etc.

⇒ **Shore Training Institutions**

These will include Maritime Colleges in many OECD countries and also wider bodies, such as the World Maritime University.

⇒ **Shore Marine Bodies**

Such as relevant ship owners organisations, lawyers, harbour authorities, P&I Clubs, consulting firms and others.

⇒   **Seafarers**

Finally, and not to be ignored, the seafarers themselves, who are the focus of this study. Linked to them, in some cases at a distance, are the seafaring unions, with the international body being the International Transport Workers' Federation (ITF).

3.7   THE CONSTRAINTS TO THE STUDY

The consultants have used their best efforts in meeting the Terms of Reference but, during the course of the research, it has become apparent that it has not been possible, in some cases, to give as true an OECD wide perspective as would have been liked - reasons for this include:

- In some OECD countries, there is only a limited, indeed insignificant, maritime presence and little or no new information has been forthcoming. All efforts have been made to include some material from all the 30 countries.

- The geographical split of the OECD makes it difficult to provide an overall collective view. Cultures, languages and sheer location render some comparisons remote, especially in those areas of training, career entry paths and the like.

- By and large, when considering the seafarer, it is the coastal / deep sea grouping that figures in this study. It is appreciated that there are many thousands of support mariners, such as tug workers, inland barge personnel and river and estuary staff, but it has not been possible to include this area.

- At many stages of the research, conflicting and contradictory statistics have emerged, particularly in regard to seafaring numbers of personnel.

- Finally, the consultants are mindful that the, agreed, four month time frame was critical and, thus, it has not been possible to wait longer for responses from questionnaires. It is therefore accepted that, due to logistics, slightly more data has been received from the UK.

4.   THE TECHNICAL REVIEW

4.1   GENERAL

The Technical Review covers the present state of world and OECD country shipping and its future development. Throughout this section, the Report concentrates on the actual number of ships, rather than the normal measurement of fleet sizes, Gross Tonnage (GT) or deadweight tonnage (dwt). Comparisons will be provided to ensure continuity with referenced figures or diagrams.

The Review identifies the extent to which the future of world shipping depends and is influenced by the fleets of OECD countries, the categories of ships and their age profiles – a conclusion is drawn from the facts.

In addition, the Review provides general information on the probable influences on the development of shipping with regard to future - these include:

- Information on present design and technology of ships
- Future developments in the commercial, legal and economic aspects of the shipping industry
- Future developments in the technological, management areas of ship operations
- The results of industrial views on ships and future development

Note: A list of relevant definitions will be found at the end of this review.

4.2   SHIPS

Ships carry 95% of all world trade. They can be as large as a 300,000dwt ULCC carrying crude oil from the Gulf to Japan or as small as the inter-island ferry carrying some passengers and live sheep across the waters of the Mediterranean. Each and every ship must be operated, navigated and maintained effectively, efficiently and in a risk managed environment. Without ships, and people to crew, manage and provide the myriad of ancillary services, national and international trade would cease to exist.

The riparian (coastal) member countries of the OECD provide the traditional core of international shipowners and seafaring nations and, in today's world, their participation and influence in the shipping industry and in the ownership and management of ships could be seen as disproportionate. The legacy of successful ship management means they control and employ a large percentage of ships, crews and personnel who operate in the wider shipping industry.

To identify what the needs and the figures will be in the next ten to fifteen years it is necessary to have a detailed picture of the state of contemporary shipping and shipping industry.

4.2.1   World Fleet

It is difficult to actually quantify the size of World Merchant Fleet, for any given time, as the number of ships, and their ownership, fluctuate on a daily basis. However, presently there are approximately 87,500 ships over 100GT (Lloyd's Register) and these ships have a total of 560 million GT.

Included in the World Fleet numbers are 37,000 miscellaneous ships, such as inshore towing vessels, dredgers, and larger fishing vessels, that make up 5.2% of the world total GT ie individually they are of a small size. Though these small ships need Officers and Ratings, their requirements have been excluded from this Report.

The ships that are identified in the Report have Lloyd's Register defined Categories, and include all cargo and passenger carrying ships, and specialist offshore ships. The World Fleet total for these ships is 50,256 with a capacity of 538 million GT (or 792 million dwt).

4.2.2   OECD Fleet

The number of ships owned and/or operated by residents and companies of the 30 member states of the OECD provide a sizeable proportion of the World Fleet.

For ships registered in OECD states and in OECD state's 2nd Registers, the number totals 17,100.

OECD accounts for 29.7% of world fleet numbers and OECD 2nd Registers account for about 4.3% of world fleet numbers.

To this figure must be added OECD owned and/or operated ships registered with other Open Registers eg Panama and Liberia. It is, therefore, difficult to distinguish and identify the full extent of ownership. Estimates have been made, working on the best available evidence.

OECD National Flag Fleets 2000		
Country	No of Ships	GT of Ships
Australia	192	1,752,299
Austria	24	89,588
Belgium	11	8,958
Canada	325	2,394,960
Czech Republic	0	0
Denmark	92	311,412
Finland	183	1,531,547
France	225	1,285,782
Germany	676	6,393,849
Greece	1,289	26,333,449
Hungary	0	0
Iceland	16	12,673
Ireland	43	181,512
Italy	910	8,781,638
Japan	4,708	14,128,354
Korea - South	962	5,577,794
Luxembourg	51	984,897
Mexico	121	696,888
Netherlands	707	4,541,121
New Zealand	32	107,783
Norway	871	3,482,159
Poland	95	949,312
Portugal	58	177,863
Slovak Republic	3	15,191
Spain	194	1,107,571
Sweden	360	2,791,861
Switzerland	21	429,275
Turkey	993	5,788,240
UK	629	5,024,730
USA	1,157	9,778,739
OECD Totals	**14,948**	**104,659,445**
2nd Register Total	**2,176**	**44,385,446**
World Totals	**50,256**	**537,849,687**

Source: Lloyd's

4.3   CATEGORIES OF SHIP

Ships trading the oceans come in all shapes and sizes, some are specifically designed to carry one type of cargo and others can have a general design to carry a multitude of different cargoes.

The crew operating these ships and the practical skills they require are diverse as the ships that they operate. Some categories of ship are more sophisticated, faster or bigger, and these may require enhanced competences to operate and crew them safely and successfully, while others provide the workhorses of the sea carrying cargoes with the minimum of fuss and trouble.

4.3.1   World Fleet - Categories and Trade

% of World Fleet

World Fleet Numbers by Category of Ship	
Category of Ship	**Number of Ships**
Dry Cargo	29,393
Tanker	11,219
Passenger/Ferry	5,593
Offshore	4,051
Total	**50,256**
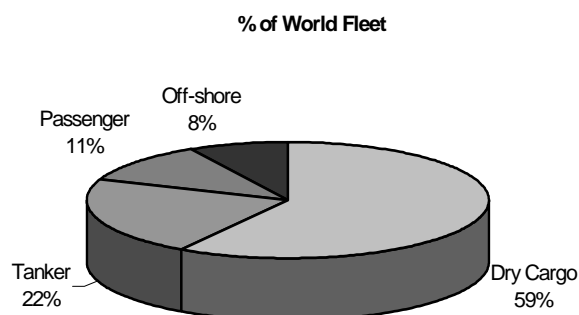
(Dry Cargo includes Bulker, Container, Ro-Ro and Reefer, etc)

World Fleet and World Seaborne Trade		
Category of Ship	**% of Ships**	**% of Trade**
Dry Cargo	59%	60%
Tanker	22%	35%
Passenger/Ferry	11%	5%
Offshore	8%	

Source: OECD & Lloyds Register 2000

Over half the world fleet of 50,256 ships is engaged in the carriage of dry cargo, this includes the transportation of all the bulk cargoes of ores, coal and grain that is approximately 20% of the world seaborne trade and the freighters carrying general cargoes, the sophisticated container ships and the fast turn-around Roll On–Roll Off's (Ro-Ro's) that account for about 40% of the world seaborne trade. Tankers provide 22% of the World Fleet carrying petroleum and petroleum products that make up 35% of world trade, while Passenger/Ferries and all other types for ship, account for the remaining fifth of the world fleet.

4.3.2   OECD Fleet - Categories

OECD Fleet by Category of Ship and % of World Fleet		
Category of Ship	**Number of Ships**	**% of World Fleet**
Dry Cargo	6,837	23.3%
Tanker	3,445	30.7%
Passenger/Ferry	3,160	56.5%
Offshore	1,506	37.2%
Total	**14,948**	**29.7%**

% of OECD Fleet
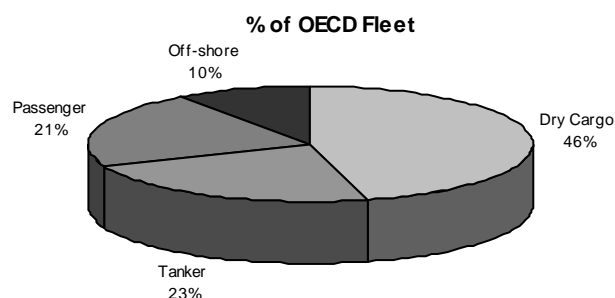
(Dry Cargo includes Bulker, Container, Ro-Ro, Reefer etc.)

OECD shipowners have a greater proportionate role in passenger/ferries and a lesser role in the carriage of dry cargo where, in specific Categories, the OECD percentage is below the World Fleet Total.

Dry Cargo - World and OECD Numbers and %										
	General cargo	**Container**	**Ro-Ro**	**Reefer**	**Other Dry Cargo**	**Pass/ Gen Cargo**	**Bulk Carrier**	**Self-disch Bulk**	**"Dry" Total**	**Fleet Total**
OECD	4,077	590	482	113	64	91	1318	102	**6,837**	14,948
World	16,755	2,590	1,882	1414	268	347	5972	165	**29,393**	50,256
OECD %	**24.3%**	**22.8%**	**25.6%**	**8.0%**	**23.9%**	**26.2%**	**22.1%**	**61.8%**	**23.3%**	29.7%

4.3.3   OECD Fleet – Specialisation

In other Categories the figures, however, disguise the high proportion of complex and technically demanding vessels that are operated through OECD countries.

These include vessels that normally require greater skills and experience to manage and operate safely and commercially, for example chemical and specialised tankers.

Tankers – World and OECD Numbers and %							
	Oil Tanker	LNG	LPG	Chemical tanker	Specialised tanker	Bulk Dry/Oil	"Tanker" Total	Fleet Totals
OECD	1,937	34	301	1,017	143	13	**3,445**	**14,948**
World	7,009	127	999	2,534	345	205	**11,219**	**50,256**
OECD %	**27.6%**	**26.8%**	**30.1%**	**40.1%**	**41.4%**	**6.3%**	**30.7%**	**29.7%**

4.4   AGE OF SHIPS

4.4.1   Age of Ships based on GT

In general, the World Fleet has grown by about 24% over the last ten years and ships' ages have become more evenly spread.

When current ages of ships, by percentage of GT, are compared with 1990, there is a more even spread of ages.

World Fleet Age Profile - GT
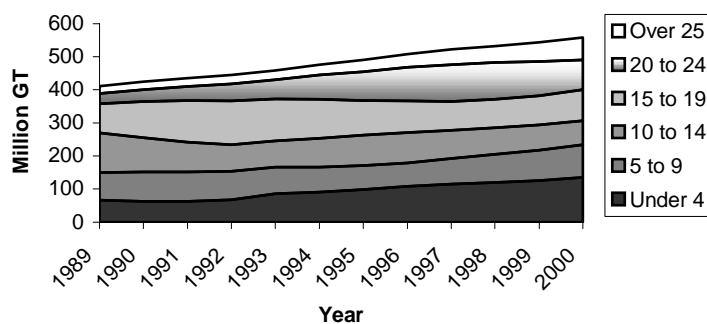
Age\Year	1990	2000
0 to 4	15.0%	24.4%
5 to 9	20.9%	17.7%
10 to 14	24.3%	13.0%
15 to 19	25.8%	16.5%
20 to 24	8.4%	16.4%
over 25	5.6%	12.0%

Source: Japanese Shipping Association - March 2002 (http://www.jsanet.or.jp)

Also in 2000, by percentage of GT, there appears to be a young fleet, with over 40% of the ships trading less than ten years old and 28% over 20 years old.

4.4.2   Age of Ships based on Numbers of Ships

However, when the ages of the actual numbers of ships trading are examined, the figures provide a different picture showing about 25% of all ships trading (by number) being less than ten years old and about 45% over 20 years old.

Year	0 to 4 yrs old	5 to 9 yrs old	10 to 14 yrs old	15 to 19 yrs old	20 to 24 yrs old	over 25 yrs old
2000	12.9%	13.8%	12.1%	15.9%	16.9%	28.3%

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Age Profiles of Categories (under 10 years and over 20 years)
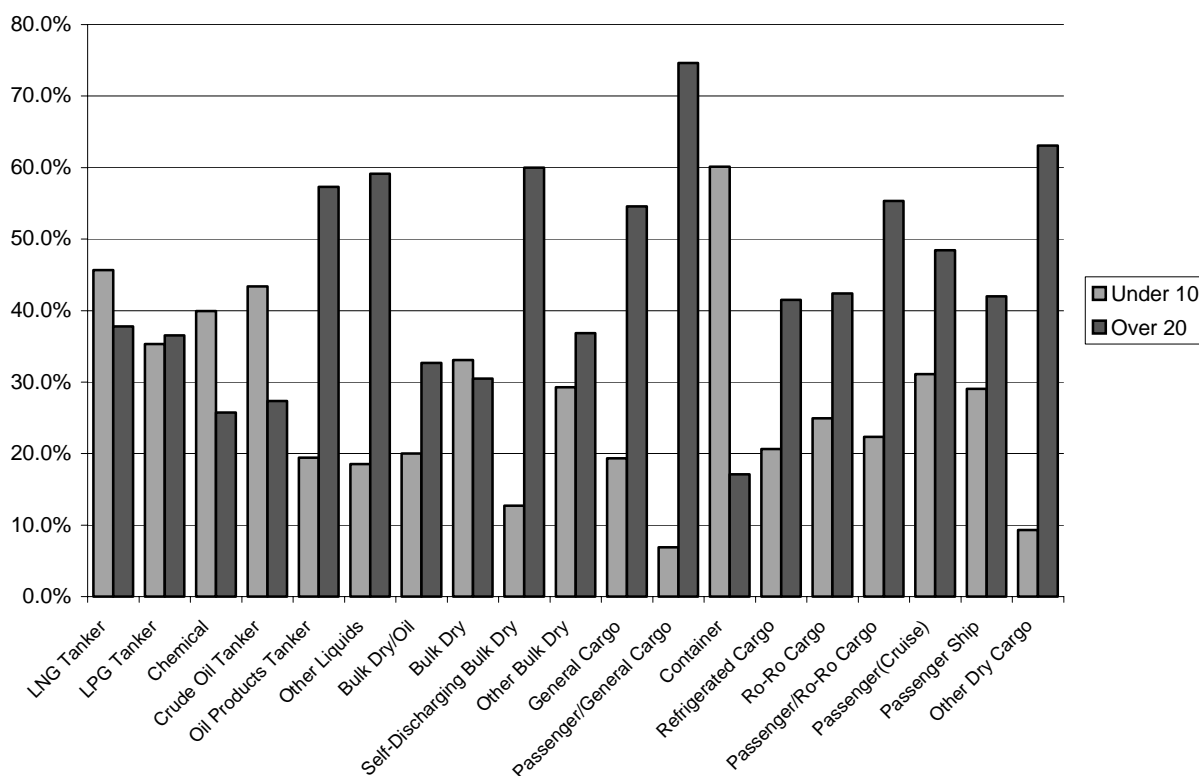
Source: Korea Maritime Institute/Lloyds Register 2000

4.4.3   Age of Ship - Specialisation

Similarly, in particular Categories of ship there are dissimilar age profiles, for instance Bulk Carriers and Tankers.

Bulk Carriers

Source: Danish Ship Finance Report 2001 (http://www.skibskredit.dk/uk/)

Oil Tankers

Legend:
- Over 20
- 15 to 19
- 10 to 14
- 5 to 9
- 0 to 4

Source: Danish Ship Finance Report 2001 (http://www.skibskredit.dk/uk/)

4.5   SHIP DESIGN AND TECHNOLOGY

"The Future Ship is fast, efficient and economic. It is fitted with latest available equipment. It has to be suitable for the intended service, but simultaneously versatile enough for other complimen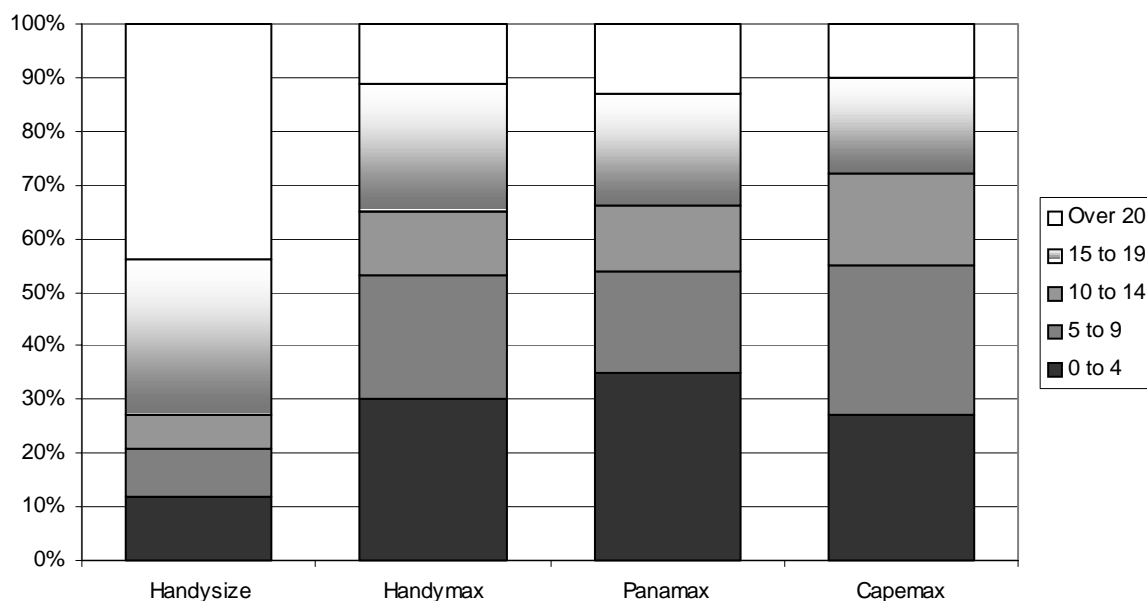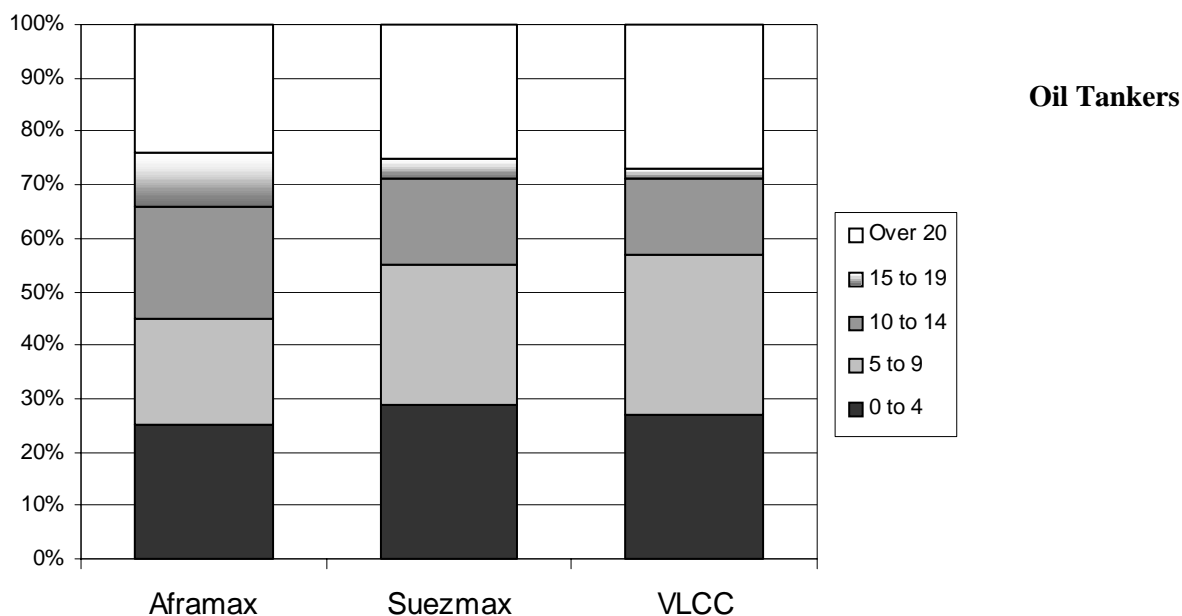tary service. It must be very safe and environmental friendly. It must be able to operate with minimum crew. It should be a pleasant workplace and home for the crew. If it is a passenger vessel, all possible entertainment facilities should be available. In addition, the future ship should also be nice looking in order not to upset anyone aesthetically." (NAVIGATOR 6/2001)

There are approximately 14,000 companies around the world that are involved with the construction of ships, their engines and marine equipment and 75% of these companies are situated in OECD countries. These companies have had a huge influence on the past design and technology of ships and shipping, and will continue to have an effect on their future. In addition, the commercial shipping organisations, both operators and users, have been at the forefront of innovation and design.

This has resulted in change and, over the past decades, ships and the management of them, have become more technically, commercially and socially sophisticated and, in certain trades, incredibly complicated. The ships carry more diverse and specialist cargoes, ships such as car carriers, wood product carriers, tankers designed to load and unload at single point moorings and a multitude of specially fitted out ships. They are in operation now and, along with the rest of the merchant fleet, they operate under a far greater amount of legislation and controlled management and often with smaller crews than in the past.

Present day ships are being built to carry complex and technically demanding equipment, and indeed ships that have traded for many years can and are being retrofitted with similar types of systems and equipment, from computer control engines and cargo systems to GMDSS, e-charts and Automatic Identification System (AIS).

In addition, ships appear to have more equipment, both manual and automatic, systems and processes and they need Officers and Ratings that have a high degree of different and diverse competences than those expected in the past.

4.6   PRESENT DESIGN OF SHIPS

To appreciate the possible future changes in design and technology of ships it is important to understand the current and recent past situation in shipbuilding. Although, as already indicated, there is a diversity of ship types from the very large to the very small, they all have fundamental characteristics of navigation, propulsion, safety and cargo handling systems and ships being built in 2002 are fundamentally the same as those that have been being built over the past decade. Included here are some broad examples of ships built in recent years in OECD countries for OECD clients and operations.

4.6.1   VLCC tanker built 1998 in South Korea

Tankers presently make up about 22% of the world fleet and 23% of the OECD fleet. OECD tanker owners have 28% of the world fleet.

Design

Overall length of 1092ft and a moulded breadth of 190ft, depth is 102.6ft and the width of the moulded skin is 11ft at the sidewall and 9.8ft at the bottom. It has a displacement of 350,849t and a gross tonnage of 160,036t. Average service speed of 16 knots and a cruising range of 27,500 nautical miles. It is fitted with a helicopter-landing area and is capable of handling a Sikorsky S58T with a 20.1m clear zone

Propulsion and auxiliaries

Main engine has a maximum continuous rating of 25,485kW (34,650bhp) at 79rev/min. Its fuel oil system uses a 50-micron automatic backwash filtration system. It also has a single double drum auxiliary boiler, which is rated at 90t/h at 16kg/cm2. In addition, there is a composite boiler with both an exhaust gas and oil-fired section, which are each rated at 2.5t/h. The engine drives a four-bladed FP propeller. The tanker is steered by a conventional dual ram system. Electric power comes from three 980kW diesel generators that operate at 720rpm. The emergency generator is rated at 400kW.

Cargo System

The vessel is equipped with five main centre tanks and five pairs of side cargo tanks. There are two slop tanks with aluminium brass heating coils, allowing an increase in temperature of from 20°C to 77°C within 48 hours, when 50 per cent full of sea water. Three grades of cargo can be handled simultaneously. The double hull spaces continue from the storage tanks to surround the bunker fuel tanks aft of the cargo section. The aft bunker tanks are protected by a 2.5m-wide cofferdam. The tanker has a ballast capacity of approximately 99,500m3 including the peak tanks.

A radar-based cargo tank gauging system features tank pressure monitoring for each individual cargo tank. The facilities allow a maximum cargo-loading rate of 18,000m/hr through three cargo manifolds with three tanks open in each segregation. The cargo is handled by three steam turbine-driven cargo pumps. These have a total discharge head of 150m and are rated at 5,000m3 /h.

For tank washing, there is a deck-mounted crude oil washing (COW) system. The two 5,000t/h heavy fuel oil and two 4,700t/h light oil purifiers are stored in the same area as the main and auxiliary engine fuel oil pumping and heating units.

Automation, Control and Electronics

Most engine and machinery control functions are carried out using a main engine control system. The main plant machinery is monitored using a dual CPU-based system. The ship performance monitoring assembly includes fuel flow meters, shaft torquemeter and computer work station.

The navigation system incorporates a dual gyrocompass, voyage management system and autopilot and two radars. There are two sets of differential GPS navigators, speed log and Voyage Data Recorder. The tanker has GMDSS area A3 radio equipment, with two VHF radio systems, Inmarsat B and C satellite communications terminals and MF/HF radiotelephone with telex and suite.

4.6.2   Oil/Chemical Tanker built 1998 in Spain

Of the world fleet's two and half thousand chemical tankers, the OECD owners operate about 40%, most of which are designed to carry clean and dirty petroleum products and IMO type chemicals.

Design

The vessel has an overall length of 115.3m, a moulded breadth of 18.6m and the moulded depth to main deck is 10.25m. The moulded draught is 7.1m. It is also ice Class 1 C. The tanker's maximum load draught is 7.6m and its scantling draught is 7.8m, with a corresponding deadweight of 8300t. It has a 400m3 fuel-oil capacity, a 120m3 diesel-oil capacity, a 20m3 lube oil capacity, a 100m3 fresh water capacity and 150m3 of industrial fresh water.

Propulsion and auxiliaries

Powered by a single non-reversible main engine and a conventional four stroke turbocharger, which is able to develop a maximum continuous rating of 3,600kW (5,382bhp) at 750rpm.The shaft line has a controllable pitch propeller and elastic coupling. The gearbox incorporates a clutch for the engine connection to an alternator-motor of 750-900kW. There is also one thermal oil boiler of 5,200kW capacity and one 1,336l exhaust gas boiler with heat surface of 131m2. Its speed is 14 knots. A piston type steering gear with automatic safety valves drives a flap type rudder. There is an emergency Diesel engine, which is rated at 105kW at 1,500rpm, and an emergency generator which produces 100kW at 400V 50Hz.

To enable docking and manoeuvring, the ship has one tunnel bow thruster with controllable pitch, with an output of 440kW, driven by an electrical motor. Control of the thruster can be achieved from the wheelhouse and the bridge wings.

Cargo System

The ship can carry 9800m3 of cargo (including the 100m3 slop tanks). Cargo is distributed by ten hydraulically powered pumps of 290m3/h and two pumps of 120m3/h for the slop tanks. There is also one 75m3/h portable pump. There are four 205Kw and one 2Kw electro/hydraulic powered units and a 3Kw/3,500rpm oil transfer unit. Its inert gas system consists of a membrane air separator unit for 725Nm3/h nitrogen generation, two 110kW feed air compressors, a 10m3 at 10bar Nitrogen receiver and a Nitrogen reducer cabinet with three discharging lines.

The tanks have monitoring systems for temperature, vapour pressure, pump and manifold pressure, cargo pumps and piping and tank radar gauging, and there is an independent system for high/high level alarms of cargo tanks. Each tank hatch trunk is fitted with gas freeing lines, carrying the vapours to high speed P/V valves (+0.2bar, -0.035bar) at the top of two structural towers on the deck. All cargo tanks are equipped with a control system with remote readings, integrated with the engine room automation system.

There are two hydraulically driven combined anchor-double drum mooring winches (fore) and two hydraulically driven double drum mooring winches (aft). One deck crane for cargo hose handling is installed amidships, at the manifold. It is hydraulically operated, of 5t SWL with 14m outreach.

Automation, Control and Electronics

The vessel is designed for one-man bridge operation and has a GMDSS A-3 Radio communication station and includes a radio console, VHF radiotelephone with DCS for channel 70, 2 Inmarsat C terminals, one Inmarsat B terminal, a Navtex rescue receiver and three portable VHF walky-talky. Amongst the navigation aids is a gyrocompass, auto-pilot, radars, GPS equipment, echo sounder, Morse light control, radiogoniometer (D/F), Decca navigator and depth graph recorder.

4.6.3   Multipurpose vessel built 1999 in Finland

The multipurpose ship is the modern equivalent of the general cargo ship, the proverbial workhorse of the world fleet, with over 16,000 ships presently operating. 24% of which operate under OECD countries flags.

Design

The 21,402dwt tweendeck ship has an overall length of 168.14m and a moulded breadth of 25.2m. Its planned trading operations were an important consideration in its design and construction. It has a hull reinforced to Lloyd's Register ice-class 1A requirements and meets recognised capacity, service speed, fast loading and discharging requirements. The ship can carry 1,100 TEU, but has been designed with the flexibility to accept a wide range of dry cargoes. The vessel has three cargo holds, with access through wide hatch openings. Flexibility is derived from the height adjustable and removable tweendeck. The vessel has five sideloaders, which enable weather protected handling of sensitive products, such as paper. The sideloaders enable the transfer of cargo between the quay and the hold bottom, as well as intermediate tweendeck levels, and enable full use of the cargo holds. It has automatic weather deck and removable tweendeck hatchcovers. The tweendeck covers, constituted of a total of 16 panels, can be locked into position at three levels or deployed as portable grain bulkheads. The deck cranes handle the hatchcovers. The container-handling capacity provides for roughly 40 per cent below-deck stowage, with the remaining 60 per cent carried on the weather deck. The vessel has slots for 120 reefer containers.

The ship is equipped with three cranes. One is positioned forward on the starboard side, while the other two are mounted laterally on the port side. The jib cranes have a capacity of up to 120 tonne within a radius of 14m. The cranes are mounted on high pedestals, due to the planned use of the weather deck for carrying containers and timber.

Propulsion and auxiliaries

The vessel is powered by a six-cylinder engine giving an output of 12,060kW. Power is transmitted from the engine via an elastic coupling through a reduction gear to a controllable pitch propeller. The engine is designed to make optimum use of space by locating the lubricating oil and cooling water pumps, oil cooler and filter on the engine. The vessel has a service speed of 19.5 knots and a draught of 10.71m.

Automation, Control and Electronics

The bridge is well equipped with an array of navigational and communications aids including two anti-collision radar systems, one of which has an ARPA facility, and GMDSS- standard communications.

4.6.4   Container Ship built 2000

Containers have been in use for the last 40 years and the specialist ships now account for a large percentage of the liner (scheduled) cargo carriage. Their numbers make up about 5% of the world fleet and 22% of container ships are under OECD country's flag.

Design

The 67,902dwt container ship has an overall length of 278.01m, a moulded breadth of 40m and a draught of 14m. It can carry 5,468 teu, including 500 refrigerated containers at a service speed of approximately 25 knots. It contains eight cargo holds and 15 hatches, teu (twentyfoot equivalent units) and feu (fortyfoot equivalent units) can be accommodated in all 2,558 teu holds and on-deck (2,880 teu). All stacks, except the outer stack beside hatch number one, can be used for stowing all feu containers. Holds are designed for container weights of 30t/teu and 35t/feu. Containers holding hazardous cargo can be carried on-deck, as well as in cargo holds. The cargo hatches are closed with pontoon covers, stack loadings are 90t/stack teu and 120t/stack teu. The vessel can accommodate a total of 500 reefer containers: 350 on-deck and 150 in the holds.

NB: "teu/feu" identifies the loading bay sizes and can be filled by multiples of containers that measure twenty or forty foot. Eg two twentyfoot containers could occupy one feu space.

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Propulsion

Propulsion is provided by a single main engine with an output of 54,946kW (74,700bhp) at an MCR of 100revs/minute. This is connected to an 8.4m diameter propeller.

Electrical power is provided by four sets of diesel engines, each with an output of 2,200kW 6.6kV. The vessel is also equipped with one diesel-driven emergency generator, with an output of 330kW, 440kV. A shaft generator plant gives an output of 2,400kW, 6.6kV.

Automation, Control and Electronics

In addition to the mandatory requirements for navigational equipment, the vessel is equipped with integrated navigation system (INS) for one-man bridge operation and with an integrated ship monitoring and control system (ISCM). The two systems enable the crew to monitor and control all navigation and machinery operations from any of the workstation monitors on the bridge.

4.6.5   Passenger/Cruise/Ferry

Passenger/Cruise/Ferry ships are the very visible Category of world and OECD shipping. The development of these sophisticated and marketable vessels has concentrated shipowner's minds for centuries and the culmination of this sector of the industry's development is being seen in the fleets and size of the ships today. The Passenger/Cruise/Ferry Categories makes up approximately 11% of the world fleet numbers, of which five and a half thousand (56%) are under OECD country's flag. There are three main areas of passenger carrying ships (5.3% of world fleet numbers), cruise vessels (0.7% of world fleet numbers), conventional and high-speed craft (HSC) short sea ferries (5.3% of world fleet numbers).

4.6.6   Cruise Ship built 1999 in Finland

The size of these vessels has grown since the middle 1990's and the largest thirteen vessels have all been launched since 1996.

	Name	Company	Launched	GT	Passengers	Crew	Operations
1	Adventure of the Seas	RCI	2001	142,000	3,114	1,180	Caribbean
2	Explorer of the Seas	RCI	2000	142,000	3,114	1,180	Caribbean
3	Voyager of the Seas	RCI	1999	142,000	3,838	1,180	Caribbean
4	Carnival Conquest	Carnival	2002	110,000	2,974	1,910	Caribbean
5	Golden Princess	Princess	2001	109,000	2,600	1,100	Caribbean
6	Grand Princess	Princess	1998	109,000	2,600	1,100	Mediterranean
7	Star Princess	Princess	2002	109,000	2,600	1,150	Caribbean
8	Carnival Triumph	Carnival	1999	102,353	3,400	1,150	Caribbean
9	Carnival Victory	Carnival	2000	102,353	2,758	1,050	Caribbean
10	Carnival Destiny	Carnival	1996	101,353	3,400	1,040	Caribbean
11	Infinity	Celebrity	2001	91,000	1,950	999	Caribbean, Mediterranean
12	Millennium	Celebrity	2000	91,000	1,950	999	Caribbean, Mediterranean
13	Constellation	Celebrity	2002	91,000	1,950	999	Caribbean, N Europe

source: http://www.cruise4.com/LargestShips.html and rjh

All passenger/cruise/ferry vessels are required to be built to the maximum safety standards of international, national and class specifications. The next main concern is the luxury fittings and spectacular design to attract customers.

The passenger to crew ratios are all between 1.6 and 3.3 passengers to each crewmember, though most crew will be hotel and concessionaire staff and less than 10% would be professional seafarers.

Design

The 140,000gt cruise liner has an overall length of 311m (1,020ft), and an exceptionally large breadth of 38.6m (126ft) at waterline level or 48m (157.4ft) at the bridge wings. Its draught is 8.6m (28.2ft). The height from keel to the top of the funnel is 72.3m (237ft) and the gross tonnage is approximately 137,300t. The total deck area is 137,000m² (1,522,000ft²) with 15,400m² of outside deck areas for passengers.

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The ship has a passenger capacity of 3,840 passengers and a crew capacity of 1,180, giving a total number of 5,020 on board. There are 667 crew cabins. The total interior (air conditioned area) area is over 90,000m² of which approximately 30,000m² is public passenger area.

The hotel facilities include 1,557 staterooms. The main passenger cabins are located on decks 2 and 3. The staterooms vary in size from 15m² to 45m². Of these staterooms, 1,077 (69%) have a sea view, and 757 (49%) have balconies. Every stateroom has a mini-bar and a 19in TV. The vast majority of the outside staterooms are fitted with a veranda.

There are 15,500 seats for passengers of which 5,300 seats are in cabins and 2,000 are seats on outer decks.

The layout features a four-deck-high horizontal walkway called the royal promenade. The length of the promenade is almost half the ship's length, with an eleven-deck-high atria called the "centrums" at either end. Almost 10% of the ship's staterooms face the royal promenade with bay windows.

Facilities

The ship has a variety of dining options, including a spectacular three-level main dining room with three separate and distinct themed dining areas. In addition to Studio B, the 1,350-seat theatre which has 25,000W of power for sound equipment and 18,000W for lighting equipment, there is a 900-seat arena for a variety of shows, including ice shows and ice-skating.

Sports facilities include an outdoor sports deck, complete with golf course, driving range and golf simulators, as well as a roller blade track and a full-sized sports court for basketball, paddleball and volleyball. There is also a rock-climbing wall. There are large facilities for children and teens and large conference facilities. The vessel also contains a wedding chapel. There are more than 400 slot machines in the casino.

There is also an unparalleled amount of space for the crew with a recreation deck, two whirlpools, three dining facilities, a gym, and a disco.

Propulsion

The power facilities are based on a diesel-electric power station. It has six engines, giving a total power of 75,600kW. The total propulsion power is 42,000kW.
The propulsion machinery consists of three azimuthing electric 14MW Azipod podded electric propulsion units. The two units on the sides are fully azimuthing, whereas the one at the centreline is a fixed unit. It incorporates an electric AC motor, located inside the propeller pod, which directly drives a fixed-pitch propeller. There are four 3MW tunnel thrusters in the bow.

Automation, Control and Electronics

The bridge is well equipped with an array of navigational and communications aids including two anti-collision radar systems, one of which has an ARPA facility, full passenger communication equipment and chart room facilities. Dynamic positioning systems (DPS) ensure no anchoring is needed in sensitive coral areas.

4.6.7   Conventional Ferry built 2001 in Italy

Design

The ferry has an overall length of 215.1m (203.7mbp) and a moulded beam of 31.5m. It has a design draught of 6.05m and a 9.4m depth to main deck. It also has a gross tonnage of 59,925t, making it one of the biggest ferry in the world in terms of gross tonnage. It has a design deadweight of 8,800t and a scantling deadweight of 10,350t.

The Availability And Training Of Seafarers - Future Impact
by Precious Associates Limited, in association with Knightsmart Limited

OECD Project

Facilities

The facilities are based over twelve decks. The main public rooms and services centre around atrium area on decks 8 and 9. Deck 8 incorporates the bureau de change, continental café and cyber cafés, shops and a children's area, as well as the hotel facilities reception. Dining facilities are located aft.

The entertainment facilities include a casino, Irish bar, two cinemas and a double-deck show lounge. Deck 9 boasts a fully equipped business centre, wine bar and a la carte restaurant. There as also a lounge bar and restaurant exclusive to freight drivers. Decks 8 and 9 are connected by processional staircases port and starboard, while all the connecting decks are accessed by a main stair tower.

The ship has 546 cabins with a total of 1,376 beds. Passenger cabins are forward on decks 8 and 9, and aft on deck 7, as well as being located throughout deck 10. The vessel is operated by a crew of 141.

At the base of the funnel on deck 12 lies a multi-functional sky lounge - the only public space - designed for access to the teak-planked sun decks outside. This sky lounge also serves as a piano bar and breakfast area.

Cargo System

For speed of turnaround, the car deck is accessed through a side entrance in the ship and consequently separated from the main freight deck entrance. The 2.7m-high car deck is designed to accommodate 250 cars, caravans etc. The freight capacity is 3,345 lane meters. The freight decks are accessed via an 18m-wide by 12.5m-long stern door/ramp. The main deck is completely flat for the easy loading of trailers. On boarding, the vehicles travel up one side of the vessel, turn in the spacious bow area, and then proceed back towards the stern on the other side.

On deck 3, a total of 1,483 lane metres (3.1m wide, 7m high) can be employed, while on deck 5, the upper trailer deck is accessed via two hoistable ramps, giving a further 1,560 lane metres. Each ramp is 58m long and 3.4m wide. While the deck is 4.8m in height, it is open aft, permitting the carriage of hazardous cargo. At the aft end of deck 7 there is an exclusive area for drivers, featuring 14 single and 39 double cabins.

Propulsion

The ferry is powered by four engines, delivering a total output of 37,800kw at 500rpm. The ferry also has two auxiliary engines, giving an output of 4050kW at 720rpm. The engines are linked via reduction gear to two highly skewed propellers measuring 4.9m in diameter. This gives the vessel a service speed of 22 knots. There are two bow thrusters for manoeuvring.

4.6.8   High Speed Craft built 1999 in Australia

The HSC is a wave-piercing catamaran introduced on the 120 nautical mile route between Barcelona in Spain and Palma de Mallorca in the Balearics. Scheduled crossing time is 3 hours 30 min.

Design

Each hull is divided into eight compartments and connected by a watertight bridging structure. The main structure is constructed using aluminium alloy. The superstructure extends along virtually the entire length of the vessel. All passenger areas are located on a single level, reached via two entrances amidships and two aft, port and starboard. The vessel has a first class saloon stretching from the bow to two amidships shops, and tourist class elsewhere.

The combination of vehicle decks and moveable mezzanine decks gives 300 lane metres, measuring 2.7m wide by 4.3m high. Vehicle access is via shore-based stern ramps, with at least four lanes. The vessel can take 230 cars or 95 cars and 12 trailers with 24 TEU or 95 cars and 24 trailers with 48 TEU.

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OECD Project

Facilities

Foot passengers board the vessel amidships via aerial walkways, or aft via stairs. Access from the vehicle decks to the passenger deck is via two sets of stairs forward and another pair located amidships port and starboard. First class and tourist class passengers have their own cafeterias, salad bars and toilets. The tourist area is based on tub seats and tables forward with rows of seats around a central services block. More tub seats and tables are available in a lounge, featuring full-depth panoramic windows across the stern.

The centrum foyer has a central skylight, with concealed fluorescent lighting around its base, and full depth windows port and starboard that extend into recesses above the deckhead to maximise light. Noise levels do not exceed 70dBA in the passenger areas and 65dBA in the wheelhouse.

Propulsion

Four engines rated at 7,200kW at 1,030rev/min drive waterjets. The waterjet control system and autopilot is interfaced with the engine management and ride control systems to ensure that reverse thrust is coordinated with a reduction in engine speed and lifting of the trim tabs.

Automation, Control and Electronics

The craft has a relatively small wheelhouse with seating for captain, first Officer and chief engineer across the main console. The vessel has small docking booths, projecting 1.5m port and starboard from the superstructure in the area of the first class lounge. Equipment on the bridge includes radars interfaced to gyrocompass, magnetic compass and two GPS sets and an integrated alarm and assessment system.

4.6.9   Offshore Support Vessel built 1998 in Netherlands

The 6,948gt offshore support vessel's design is intended for the development of offshore oil fields in water more than 3,000m deep.

Design

The OSV is a monohull, multipurpose ship with a large deck area and, at 5,728 tonne, a high deadweight capacity. Her powerful dynamic positioning systems (DPS) combined with a high transit speed make her ideal for diverless subsea installation of flexible pipes, risers, templates, manifolds, moorings and umbilicals. The vessel meets the same standards as a mobile offshore drilling unit and can support both drilling and live well intervention operations. Key features include high capacity craneage, below decks carousels and large twin moonpool of 6m^2 each situated fore and aft. The forward pool is configured for flexi-lay and the aft pool for well intervention, workover and tool deployment.

The 1,640m^2 clear deck area includes a mezzanine deck, where two work-class remotely operated vehicles (ROV) are permanently installed, and there is a helideck forward of the accommodation. Space is provided for 100 persons in single- and double-berth cabins and includes offices, a gymnasium and a hospital. State-of-the art IT equipment to ensure the vessel was compatible with onshore activities, thus allowing staff to work the same way as if they were on land.

The ship has a large storage capacity and lay system with two underdeck carousels, capable of holding up to 1,250t. Five reels each of 9.2m diameter can be used through the vertical lay system aft of the forward moonpool. In addition, construction and storage are facilitated by two onboard cranes of 30t and 150t both on the starboard side but capable of lifting operations over the port side as well.

Propulsion

The propulsion system is a diesel electric arrangement based on four engines, each driving an alternator producing 2,660kW at 660V and providing a total installed power of 10,720kW. There is also a single harbour generator of some 750kW and an emergency generator of 100kW. This arrangement provides power for two fully azimuthing fixed pitch, variable speed nozzle thrusters located astern and in three variable pitch tunnel thrusters in the bow. The stern thrusters give the vessel a service speed of 13.5

knots. Dual redundant engine rooms and separate compartments for the ship's switchboards allow normal operations to continue in the event of an emergency.

Automation, Control and Electronics

The vessel's dynamic positioning (DP) systems have Class three ratings, with control available from two fully independent control stations in the wheelhouse and the emergency control centre. The control rooms all incorporate video, navigational, voice and networked links throughput the ship. The DP system has inputs for dual differential GPS, sonar, HiPA, tautwire, motion and heading sensors and fully redundant environmental sensors for deepwater positioning. http://www.ship-technology.com/projects/

4.7   FUTURE DEVELOPMENT

The future development of ships, their management and operations is open to a wide range of speculation from the "nothing will change" to the distant dreams of one man crews, shore based automation and High Speed Craft that can sail at 50 knots through all kinds of weather, on all kinds of seas and carry economic amounts of cargo. The truth will lie closer to the former than the "distant dreams" and the reality of costs and risk management ordains that the changes that occur in shipping will continue to be gradual and incessant.

However, according to the OECD forecast, demand for new ships will keep rising in the next few years, peaking at 21.8m GT in 2004. Current worldwide shipbuilding capacities will cover this demand. Shipyards will increase their capacities by 15.5% to 26.7m GT up to 2005. New ships will bring in innovative designs and ideas for operators to contend with. In addition, there are fundamental changes that will take place and that will affect the future of the crews, managers and the ancillary organisations related to ships.

4.7.1   Trade Patterns

The need for different ship types is varying strongly over time. Old workhorses of the general cargo ship design are gradually leaving the scene to new types entering the same trades and special designs are developed to serve new trades for special commodity types, wood products, car/vehicle carriers, heavy lift etc. The containerisation of general cargo trades is one of the most prominent features. Providing "round the world" voyages to major centres and having feeder services to take the boxes to more convenient ports. Reefer vessels have suffered strongly from the competition from refrigerated containers. However, several reefer trades in bananas, other fruits, fish or meet do not fit in easily with the large around-the-world container services and are continuing to trade with specialist ships. www.lb-kiel.de/en/en.jsp : Fearnleys A/S

The coastal trade of many countries has diminished because of the perceived advantages of the large articulated truck and the increase in the Ro-Ro ferries, which take the trailer, and the through ferry which takes the tractor unit and trailer. See later

4.7.2   Legal

The importance of legislation cannot be ignored and a quick overview of the present scene is.

Management Systems – the implementation of the International Safety Management (ISM) Code in August 2002 identifies the responsibility of the operator in the management of all ships over 500GT. The long-term effects on shipping through the possible pressure from associated organisations ie banks, insurers, P&I and classification societies could lead to a reduction in the number of ship operators though not a reduction in the number of ships.

Hours of working - In 1997 the minimum rest requirements entered into force as part of STCW '95, and in the future these will be augmented by the additional ILO requirements contained in the ILO Convention on Seafarers' Hours of Work and the Manning of Ships (ILO No. 180), which is expected to come into force within a short period of time. The new legislation on minimum rest requirements will probably present an operational challenge to some shipping companies seeking to ensure that they are in

compliance, especially those ships that operate on the Minimum Safe Manning numbers, with some confusion on what the actual regime, hours of rest and work will apply.

MARPOL – Annex I – Oil: Since 6 July 1993 Regulation 13F requires all new tankers of 5,000 dwt and above to be fitted with double hulls separated by a space of up to 2 metres (on tankers below 5,000 dwt the space must be at least 0.76m). Double-hull tankers offer greater protection of the environment from pollution in certain types of accident. The new global timetable (1 September 2002) for accelerating the phase-out of single-hull oil tankers will see most single-hull oil tankers eliminated by 2015 or earlier. All new oil tankers built since 1996 are required to have double hulls. The 2002 figures for INTERTANKO owners indicate they presently represent 1,451 double hull tankers (43% of the operated fleet) and with a 20% order book for building new ships the replacement of its existing fleet is continuing apace.

MARPOL – Annex VI – Air: Will set limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibit deliberate emissions of ozone depleting substances. Many ship operators are already installing the equipment in anticipation of its final ratification.

Environmental – Control of water ballast for non-indigenous life and discouraging the introduction of foreign organisms to any ecosystem and the avoidance of toxic paints. With the "International Convention on the Prohibition to Use Paints Containing Tributylitin (TBT)", approved in October 2001, the use of paints containing the antifoulant TBT that, at even very low concentrations, is toxic to fish and other aquatic life is prohibited as of 1st Jan 2003 and by 1st Jan 2008 must be removed from hulls or "sealed" to prevent them from harming the marine environment.

Security – The IMO Conference on Maritime Security (December 2002), introduced the International Ship and Port Facilities Security Code (ISPS) - these new regulations will enhance ship and port security and avert shipping from becoming a target of international terrorism, the aim is to reduce risks to passengers, crews and port personnel on board ships and in port areas and to the vessels and their cargoes.

Seafarer Conditions – At the 29th session of the International Labour Organisation's (ILO) Joint Maritime Commission (Jan 2001) a major agreement was announced, known as the Geneva Accord - this is designed to improve safety and working conditions in the maritime industry by formalising a joint convention containing and updating all the most important existing ILO rules. It also agreed to update the ILO minimum wage for seafarers from $435 to $450 with effect from 1 January 2002 and to $465 as of 1 January 2003. Participants to the session, including representatives of shipowners and seafarers, resolved, "the emergence of the global labour market for seafarers has effectively transformed the shipping industry into the world's first genuinely global industry, which requires a global response with a body of global standards applicable to the whole industry." The amalgamated Convention will be adopted in 2005.

4.7.3   Economic

Regional Policy

The European Commission has unveiled a package to promote European short sea and inland water transport to alleviate growing road gridlock. The series of recommendations emerged in a package of policy guidelines adopted by the commission last week in its White Paper on the future of a common European transport policy, which were formally adopted in September. "The aim of this document is to provide the European Community with a programme of actions to gradually de-couple transport growth and economic growth," the commission stated. The guidelines note that goods traffic within the union is expected to increase by 38 per cent up to 2010 and passengers by 24 per cent, which will exacerbate congestion of urban centres and principal trans-European corridors.
(Fairplay International Shipping Weekly)

Tonnage Tax

Tonnage tax –Tonnage Tax is an alternative method of calculating corporation tax profits by reference to the net or gross tonnage of the ship operated. The tonnage tax profit replaces both the tax-adjusted commercial profit/loss on a shipping trade and the chargeable gains/losses made on tonnage tax assets. Other profits of a tonnage tax company are taxable in the normal way.

A number of OECD countries have their own tonnage tax regimes, with others expected to follow, some in the near future. Countries where this will be found at present include The Netherlands, Germany, UK, Denmark, Belgium, Finland and Spain - likely countries to follow may include Ireland, Sweden, France, Italy and the United States.

Many Registers provide this tax, and subsidies based on it, to encourage its nationals to remain with or return to the national flag. In certain instances, if members of the crew of the vessel are Flag citizens, a percentage of the tonnage tax paid by that vessel may be refunded for each month they are employed on board the vessel. Tonnage Tax can also provide training subsidies to participating owners.

<u>Cabotage</u>

Cabotage – is defined as "the reservation of a country's domestic shipping trades to ships flying the national flag of that state," and applies to coastal and deep-sea voyages, as well as shipments on inland waterways. Traditionally, most nations have applied some controls on commercial shipping engaged on their domestic trades. Ships engaged on cabotage trades have variously been required to be:

i)   manned by the country's own citizens;
ii)   wholly or majority owned by domestic nationals;
iii) built at domestic shipyards; or
iv)   registered under the country's national flag.

The reasons given for its application vary but tend to include the protection of a national flag fleet and the availability of ships if needed for defence purposes, and in the latter case some states give subsidies as an incentive to keep ships on the national register. Attitudes to cabotage differ from country to country. Countries in the EU are reducing cabotage, albeit in some cases reluctantly, as part of cross border trade liberalisation.

In 2001 there were indications that the British fleet had grown by 40% for a second consecutive year and the fleet registered under the Dutch flag has almost doubled in size since 1996 (Belgian Shipowners Report 2001).

4.7.4   Technical advances

The faster development of marketable products for the system "ship" is being driven by the increased demand for cost-efficient vessels. Globalisation, the force leading to greater intercontinental merchandise flows, can be seen as the force behind world shipbuilding, The result is that the world merchant fleet is growing all the time. Ships and shipping must change to accommodate the increased demand for trade.

<u>Machinery</u>

Engines are being given more "intelligence" thanks to rapid advances in electronics and software. Engine makers present low-consumption and environment-friendly propulsion systems as a way of becoming more cost effect with larger ships needing larger propulsion systems and the engine sizes breaking the 100,000 hp barrier.

The main engine is a decisive cost-efficiency factor for giant containerships. Engine makers have has reported that the 100,000 hp limit was exceeded this year. An 84,000 hp engine would handle a 10,000 TEU ship if a speed of 24 knots were needed. An output of 120,000 hp would be required to give the ship a service speed of 26.5 knots. If an 18,000 TEU giant needed to make 26.5 knots, the propulsion system would have to produce 160,000 hp. As this cannot be realised with engines now available, two engines will probably be installed.

<u>Equipment</u>

The introduction of quantitative risk management and proper safety management in companies has highlighted the need for redundancy systems in areas of critical operations. These, of course, include all safety and environmental activities and cover everything from increasing the hull scantlings and reducing the high tensile steel content, each of which has been implicated in accidents to fundamental changes in propulsion arrangements where ships, especially larger tankers operating in environmentally sensitive

areas, are being built with "fail safe" systems or "propulsion redundancy systems" that include two independent engine rooms or twin diesel electric power systems in segregated engine rooms, multiple steering systems, twin propellers and twin rudders.

Duplication also appears with navigation equipment, where the requirements of SOLAS, eg two radars, have been extended to include offtrack-monitoring systems.

The safety of the ship, crew and environment is being enhanced by using full use of inert gases to prevent explosion in tanker ballast spaces (a concept first raised in the early 1990s). In addition, improved inert gas "double" scrubbing is used in ballast and cargo tanks to get rid of more amounts of the noxious substances that erode tank plating.

Innovations also include improved internal tanks coatings, where coal tar epoxy paints are being applied to reduce corrosion and all areas above the waterline are being painted white to reflect heat from the sun and reduce degradation of the epoxy ballast tank coatings and corrosion. (Lloyds List 27th May 2002)

Nitrogen, as a pure inert gas, is growing in use especially on chemical tankers where it is being introduced to blanket cargoes, inert tanks and avoid cargo contamination in the chemical carriers that can provide carriage for 40 or more different cargoes simultaneously.
The use of better steels and coatings has been seen as extending the possible working life of ships.

Safety legislation, through SOLAS, is introducing the Emergency Escape Breathing Device (EEBD) onto all ships.

Onboard Systems

The supply of navigation and automation systems will continue to benefit from the IT improvements and economies that come with the continued development of microchip technology.

Automatic Identification System (AIS) – a shipboard broadcast transponder system in which ships continually transmit the identification, position, course speed and other data to all other nearby ships and shoreside authorities. It will probably become mandatory through USCG and IMO (December 2002) for all ships of 500GT and above.

Digital Charts – vector charts are digitised from paper charts published by all the major national Hydrographic Offices. They have a high accuracy level of data presentation that provide complete navigational information during a voyage. Their scales varying from 1:1,000 to 1:200,000,000 and have the facility for selecting a wide range of information layers, which can be shown simultaneously on the chart screen. The "chart screen" can be either a VDU or a projected image on the chart table.

Navigational Data - exhaustive information is available on electronic media, including Navigational, List of Lights, Climatic, Port Information, Tides and Currents, Distance tables and databases.

Integrated navigation system - uses official electronic chart data with various types of positioning and navigation systems, including GPS, radar/ Automatic Radar Plotting Aids (ARPA) and provides facilities for Voyage data recording, Route Panning and Monitoring, Search and Rescue operations and many other vital tasks. There is often a capability to integrate with all other Navigational and Commercial data.

Planned maintenance programs – allow the ships routine and emergency maintenance schedule and work to be identified and recorded. Many carry out automatic feedback to the management offices and provide automatic component and spare part ordering.

Voyage data recorders – Using an electronic chart system and showing the ship's actual courses, speeds and helm movements. It can also provide radar target track information. The recorder can be used as a management tool to assess the onboard competence of personnel.

4.7.5   Technology in Management

Many software companies provide database programs that can be tailored to fit a ship operators management needs. Most carry the fundamental aspects of management, finance, technical, personnel,

purchasing and operations. Many can be used to provide integration with shipboard system such as budget and planned maintenance. Some, eg Transas Fleet View (http://www.fleetviewonline.com), are designed to include a fleet tracking product that can be configured to receive vessel position reports to company requirements and poll a ship for an instant response. Alarm parameters can be set, for example, to warn the operator of a vessel approaching a certain area, or the approach of unknown vessels. In addition, with the ship emulator, the operator can plan the ships route and determine required course changes.

E-commerce

The use of IT solutions to improve and up-date the anachronistic recording and transmitting of cargo transactions has many proponents and many solutions have been heralded, however, in the commercial world suspicion is rampant and very few progress.

Information

IT provides a vast amount of electronic information. Any number of CD-ROM and DVD (for large amounts of storage) can provide a compendium of IMO regulations, database of every kind of ancillary organisation in the shipping industry in any part of the world, regular up-dates of chart corrections for electronic charts and "hard copy" (ie real ones), maintenance manuals and spare part catalogues, etc. Web sites provide instant access to information on the most recent documentation from IMO, national governments, port state control and many more areas.

Improved Communications

Satellite communications from geostationary and low level orbits can provide instant communications between the ship and shore, whether management office, shore authority or Vessel Traffic Services.

4.7.6   Things are getting bigger!

(Though in general ships are not!)

Container ships

In 1997, in CONTAINERSHIP TECHNOLOGY, Dr. Hans G. Payer of Germanischer Lloyd reported: "On the ship (container) side, as a further reduction in crew size seems unrealistic at this point in time, the size of the ship itself offers a way of improving operating economy….taken as an average of all the round trip variants that were studied, the highest yearly income can be obtained with an 8,000-TEU vessel sailing at 24 knots."

In 2002, GIANT BOXSHIP STILL ON COURSE - the drive towards ship capacities of 9,000 teu, 10,000 teu and beyond has seemed inexorable. The latest OOCL ships under construction at Samsung Heavy, for example, were originally ordered as 7,400 teu capacity ships, but have subsequently had their capacity adjusted to 7,700 teu, while unofficial reports suggest that stacking seven high above deck will, in fact, yield 8,000 teu.

It should be pointed out that prevailing economic conditions have encouraged opponents of the logic behind the mega-containership to become more vocal, with some suggesting that the 'bigger equals better' proposition is open to doubt. Drewry Shipping Consultants and CGM CMA believe that larger ships would lack flexibility, Drewry recently stating: 'While ships are physically mobile assets, large ships clearly suffer from a severe lack of market mobility.' Financial Times 23/08/2002

The five million-teu mark was reached in June 2001, it took almost three years to add the last one million teu to the world fleet's capacity, but with an order book of 1.7 million teu outstanding, it is possible that the world's container fleet will reach six million teu by end of 2002.

A study carried out by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) has predicted that in the next decade, container throughput volumes in the Asia-Pacific ports will rise to double or more. This will require 1,342 additional containerships in the Asia-Pacific region amounting to an estimated investment of nearly US $ 60 billion, according to the study. Similarly,

the increased volumes will require 427 additional container berths amounting to a US $ 27 billion investment. Some 29 per cent or 125 berths will be required in South-east Asia, while 39 per cent or 164 will be required in China.

There will be some of the ultra-large 12,000 TEU ships (ie in the region of 150,000dwt) in operation by 2011, but the number will still be relatively small. This will alter the shipping patterns in the region, depending on two likely scenarios. The first involves the possibility that these bigger ships will simply replace existing big ships, which will then make only one or two ports of call in Asia and so placing a greater requirement on the feeder system. The alternative scenario sees a reduction in the number of feeder services required as the second tier ships take on a more feeder-like role once these big ships come online. www.exim-india.com/link/

Passenger ships

The ocean liner Queen Mary 2 being built in France for Cunard will be the largest ocean liner ever constructed when it is introduced into service in 2003. It will be 45.03m long and have a beam of 40m or 45m at the bridge wings. Its draught will be 9.95m and the height from keel to the funnel will be 72m. It will have an estimated size of 150,000GT and a speed of 30 knots. The vessel is due to carry about 2,620 passengers and 1,254 crew. www.cunard.com/

Ferry

The 2001, the world's largest ferry, 50,938gt went into service on the Dublin and Holyhead route. The 12-deck vessel has parking decks extending for nearly three miles that is enough room for more than 1,340 cars or 240 articulated trucks on each trip. It is also capable of carrying 2,000 passengers and crew on each trip.

4.7.7   Things are getting faster! – HSC

High Speed Craft (HSC) includes air-cushion vehicles (such as hovercraft), hydrofoils and multi-hull vessels, such as catamarans. Higher speeds, sleeker lines and improved passenger comfort are fast ferry designers' and builders' answers to an international increase in demand. HSC appear at present to be utilised mainly on coastal area shipping, as high-speed passenger and car ferries. The size can be anything from a twenty metre, twenty-eight knot craft carrying up to ninety passengers to a 122 meter, 40 knot craft carrying 1,000 passengers and vehicles, as many as 172 cars and five buses.

For propulsion they can be fitted with the most modern technology of environmentally friendly gas turbines or robust diesel engines connected to waterjets. Fabrication is mainly with the lightweight aluminium.

4.7.8   Crew sizes

Crew sizes are dictated by the size and operation of the ship, its machinery and trading area. The principle document for identifying the number of crew required is the Safe Manning Certificate issued by the flag state of the ship when the ship is registered. The safe manning number of crew is based on the operation when the maximum number of people will be needed, the watchkeeping regime onboard and any automation being used. While many ships use the SMC as the definitive number of crew required, other companies use it as a minimum guideline and allocate additional personnel as required. The SMC number is checked by port state control to ensure compliance. Any lower variation to the number identified is allowed under contingency circumstances but is rigorously controlled.

Operating manning levels, ie additional to SMC, can be seen as a subjective decision based on the experience of the management team. It can be an economic trade-off between allocating extra crew or providing back-up riding gangs for scheduled maintenance operations, accepting that non-statutory work will be completed slower or at the expense of overtime payments to the crew.

Automation has slightly cut the numbers of crew required, for example, unmanned engine rooms, that allow engineers to be day workers and are closed and monitored from the bridge during the night time, have allowed a large reduction in crew manpower. Hydraulic hatches, automatic steering and cranes have reduced the number and need for deck crews that were expected to prepare ships for work in port.

Automation allows larger, faster and more complex ships to be operated with smaller crew, for example a large tanker, with twin engine rooms, operates with a total complement of 25 people as against a possible crew of about 28 on a conventionally equipped one. (See The People Review)

4.8   SHIPS AND THE FUTURE – AN INDUSTRY VIEW

With the new technology that is available on the market, it is important to understand if each side of the shipping industry, builder/manufacturer and owner, has the same views as to its future development.

During the preparation of this Report questionnaires were to different categories of "stake holders" within the wider industry and the results received back, for the future needs and developments of ships and their equipment, provides an indication of the collective views.

Builder

For developing a new design or product, the overwhelming majority of ship builders and equipment manufacturers identified reliability as the most important aspect. Efficiency, simplicity of design and needs of the client were all major views that provided the second category of importance. Only a small minority, however, considered the human factor in both crewing numbers and their training as important.

With regard to major developments over the next 5 - 10 years, the ship builders and equipment manufacturers identified that decreased maintenance and increased reliability would play a major part, although main engines efficiency was a strong contender as well. The importance of IT did not rate very high with this group nor did the idea that ships will develop in size. In general, there was a feeling that ships getting larger was not probable.

Owner

The owners who responded identified efficiency and reliability as the major factors of purchase of the ship or equipment, followed by the needs of the client, this obviously recognises the fact that they will be selling a service with the ship and it must meet the quality definitions of needs and expectations of the customer. Again the personnel factors of the ship were not considered as significantly important.

With regard to major developments in shipping, the owner respondents identified engine efficiency as the highest factor, and decreased maintenance and IT coming in second place. Again, they do not see larger vessels playing a significant role in shipping.

A case study developed during the research is included.

Buying or building

The strategic building or purchase of a ship and its equipment is an enormous investment on the part of the owner/operator and the builder/manufacturer. The consequences of either party making the wrong decision are incalculable. The risks associated to the financial, commercial, social, safety, environmental and reputation aspects of building or buying incorrectly could have a catastrophic effect on the buyer or builders operation and future.

Therefore, it is not surprising that both owners and builders thought the most important considerations in the sale of a ship or marine equipment was reliability and efficiency of the design was the first choice, with the needs of the client as the next. It is also not surprising that builders cited "simplicity of design" as an important factor as it makes it easier for them to build.

Areas of note are that both sides played down cost as a factor and both put manning and training as a very low priority.

Future developments

From the options of major developments identified during research, the collective opinion of respondents indicates that the future development of ships will not be based on size, as both builders and owners put

larger ships as a low priority. The great majority thought that more efficient engines and decreased maintenance will lead future developments.

IT scored high with the owners and, surprisingly, less so with the builders/manufacturers, this is possibly because the owners take a longer-term view on the use of the machinery and equipment and the ships operation. They see the advantages of building-in a means of monitoring and recording engine conditions, rather than relying on a person of unknown ability providing the information in the future.

When asked about other future developments they could foresee, the only additional factors introduced were automation and the implications that could have on design, mooring systems, the environment and future costs.

4.9   OBSERVATIONS

4.9.1   Overview

From the research and evidence available it is very likely that over the next 5 to 10 years the introduction of new tonnage, new ideas and new work practices will continue to be a gradual process. The forecast for the world fleet and its operation, from present ship's age profiles, trends and usage, indicates that by the year 2012 there will be very little difference in the overall fleet make-up, the technology it uses and the number of seafarers it employs. In fact, over two thirds of the ships operating today will still be trading.

4.9.2   Ship Size

From research and questionnaires it would appear ships are reaching an optimum size, the restrictions of canals, rivers and terminals have already sub-Categorised the oil and bulk trade and the economic and financial needs of clients are setting other limits.

Certainly the "build bigger" frenzy of recent decades has modified and the only areas where size seems to matter are container ships and cruise ships, the former to gain the economies of scale of transporting 1,200 teu with the same basic expense as 600 teu and the latter to gain the economies of scale of transporting 3,000 holidaymakers rather than 1,500. Because of the minor role they both have in world and OECD fleet numbers, (Containers 5.2% and Cruise 0.7%) there will be no noticeable affect on the demand for seafarers by the extra building or the increased size.

4.9.3   Tankers

Obviously there will be a few Categories where building of new tonnage and the implementation of new technology may have a greater effect, for example tankers, where complying with the regulations on double hulls has required an increased building program that will alter their age profile considerably up to 2015. However, non-regulation ships will be unemployable as the new, MARPOL conforming tankers, replace them and they will be scrapped rather than sold on, so the actual number of tankers operated will remain fairly constant.

4.9.4   Container ships

The containership sector, as mentioned above, is also identified for a change, with new buildings of larger ships that are approximately twice the size of present vessels. The new ships will operate on the present fixed routes between major terminals and will displace the existing ships. Some of the existing ships may find work as feeder vessels to the secondary ports, but most will be too big for these ports' infrastructure.

As the present size of container ship is purpose built for major container terminals they will find it difficult to adjust to any other trade and will, thus, be scrapped. So it is possible there will be a decline in this Category of ship numbers but an increase in the total tonnage / teu's to accommodate increased world demand.

4.9.5   Technology

The research and questionnaires carried out indicate the changes that will be implemented through new buildings of all ships are certain to include more efficiency and reliability in the ship and it systems. In addition, decreased maintenance of the ship and systems will be paramount; this will include all aspects of mechanical and electronic equipment as well as metal protection, tank coatings, and ropes. Builders of ships, manufacturers of equipment and operators all seem to be aware of the possible shortcomings in present day practical competences and the probable skills of future seafarers (see The Training Review).

4.9.6   Main areas of future change

Other areas of change identified for the next 5-10 years will be for legal, risk control, economic and efficiency reasons and, in many cases, they will affect existing ships or ship's systems.

Legal

The major alterations to ships and the way they operate will be imposed by changes in the international law. Both environmental, through MARPOL, and safety law, through SOLAS, are imposing retrofitted additional equipment and process changes. Air pollution, toxic paint pollution, ballast water pollution and additional safety equipment will each have a large part to play in the operational and technical demands of the managers and the crew of the ship, for example, the introduction of a small item such as an Emergency Escape Breathing Device for seafarers protection is another sophisticated item of equipment that, for full benefit, must be trained in and maintained correctly.

Economic

Economic factors related to the regional use of ships, eg EC's short sea trader initiative, and increasing the viability of national flags, through cabotage and tonnage tax, will have a local effect, however the overall influence on OECD (or global) ship numbers and technology will be negligible.

The main reasons for this are connected to the uniqueness of the shipping industry and the way ships are operated. Shipping is a peculiar industry in that a ship, unlike a factory, is a mobile asset that can be moved physically from location to location to take benefit from prevailing local conditions. If a major owner has a ship that it is felt to be uneconomic to operate, it can be traded down to another owner with lower operating overheads. It is also an option for the original owner to continue operation, but lowering the operational costs of the ship through re-flagging to reduce corporate costs, employment overheads and re-arrange crewing. In addition the operator can move the management office's location to a country with more benign financial expenses, cheaper office and office labour costs etc. In all cases it is possible to extend the economic life of the ship, which continues to trade but with changed circumstances of management, flag, nationality of crew or geographic location.

Risk Management

The management of risk through adequate controls in all aspects of the ship's operation is paramount and owners or management have ensured that environmental considerations have had a high priority over the last forty years, certainly since the Torrey Canyon sank in 1967. The benefits of paying attention to environmental issues have been highlighted even more so since the Exxon Valdez grounded in 1989. The possible catastrophic consequences to owners' and managements' business and reputation that ignore it have been well illustrated.

The owners of ships, especially tankers that have been built recently, are very aware of the environmental issues, not only managing when an incident occurs, but the consequences of not managing the possible risk of it happening. Ships built for environmentally sensitive areas are being fitted with full redundancy for the ship's propulsion and control, eg two engines, steering equipment and rudders. What is occurring in European and US trades will eventually, as global lobby pressure intensifies, become more prevalent in other areas.

An additional area of risk management by shipowners that could increase the number of ships managed by OECD shipmanagement companies and hence shore employment in OECD countries is from the

effects of Port State Control, P&I Clubs and the ISM Code. With PSCs', increasingly robust, inspections of the safety aspects, including the application of the ISM Code, of ships trading in their ports many owner may feel it prudent not to continue managing their ships in the family company tradition and look for more efficient ways of operate their ship(s). Though this will probably not have an affect on the either the technology and crewing aspects of the future it could increase the pressure on the employment of ex-seafarers in the management offices.

<u>IT Developments</u>

The continued growth of IT and communications are guaranteed, although it is hard to estimate the proportion of operating ships that have access to a computer at present and impossible to estimate how many will be using them in the future, what is certain is that more ships will be presented with computers to make things "easier" for them to operate. If done correctly, the introduction of computerisation should provide data that is of immense use, especially in safety operations where incidents and accidents can be analysed to identify trends and prevent similar events occurring, and in commercial operations eg Electronic Data Interchange (EDI), and could provide a way forward in e-commerce to enhance shipping's trading, logistics and transport procedures.

In general, IT provides a wide range of solutions to perceived problems in the shipping industry and much is being done electronically to provide up-to-date information through CD-ROM, DVD and web sites. This can only increase, though whether the ship's crew or the office personnel can deal with an increase in the information overload that is experienced today is to be taken into consideration.

<u>Control</u>

Many current ship operators, owners or managers have also taken an IT route to provide better management, they have ships producing daily data that records almost every facet of shipboard operations, navigation, maintenance and cargo. This is transmitted to the ship's management office for analysis and comment. As the cost of IT and communications reduce, it is probable that over the next decade more owners will see this as a way of providing a "due diligence" control and "management" over their ships and will increase their use of onboard systems.

4.9.7   Crew Size

Crew sizes are dictated by the operation of the ship. Apart from some well-identified cases of passenger ships that require larger numbers of hotel staff, crew sizes will not alter drastically with technology, up or down, over the next 5 to 10 years. Though some vessels will get bigger (see above) this is unlikely to result in an increase of manning levels.

One area that may result in increased numbers of crew is the application of the recent regulations on minimum rest and maximum working periods. There is good anecdotal evidence that some ship managers have analysed the monitored hours of work and are looking at increasing crews by 1 or 2 to ensure compliance with the law. This will be any area of major concern for the short sea traders and offshore vessels that have a concentrated period of work.

What will cause deterioration in the situation over the next 5 to 10 years is the expected increase in shipboard activity regarding safety management systems, training and IT input. There is only a finite number of hours available for work and if a watch is to be kept safely, the Officer of the Watch can only carry out safety tasks. This means the bulk of the administration and training must be completed in non-watchkeeping time. Obviously this is "work" and the maximum hours regulations will apply.

4.10   CONCLUSIONS

From the information identified in this Technical Review, that has been gleaned from questionnaires, comments and research carried out, it is reasonable to expect there will be a slight overall increase in ship numbers over the next 5 to 10 years, but it is also reasonable to state that there will be no significant future developments in technology or work practices that will have a dramatic affect on current ships crewing levels.

There could be a slight reduction in the demand for crew numbers through increased technology that can be implemented in new ships and there could also be a slight increase in crew numbers due to the additional administration work to be carried out and the minimum rest period legislation. But overall, with the preponderance of current shipping being used today still being used in the future, the crewing sizes of ships will not alter significantly. Therefore, the net effect of changes in the number of seafarers, both Officers and Ratings, employed on individual ships will be negligible.

What will change, however, is the need for different skills today and in the future. Skills that take account of the introduction of new equipment required by the implementation of revised Conventions, skills that take account of the increased administrative role that many Officers now have and skills that take account of the different onboard management challenges frequently encountered onboard ships today and probably more so in the future.

It is the changes in skills that must be addressed.

Definitions

⇒ Gross Tonnage (GT) – a measure of the ship's size as a function of the moulded volume of all enclosed spaces of the ship. Gross tonnage is the basis on which manning rules and safety regulations are applied and registration fees are reckoned.

⇒ Net Tonnage (NT) - a measure of the internal capacity of a ship, tug or barge's cargo space volume only. Port fees are also often based on NT.

Deadweight tonnage (dwt) - the maximum weight of cargo and stores that a ship can carry. Is expressed in metric tons (1 000 kg) or long tons (1 016 kg).

⇒ Register – recording the ownership of a ship with the authorities of a country. All aspects of the ship's legal obligations are taken through the national laws of the registering country, often referred to as the "Flag State". Traditionally, the country of the operator or owner of the ship was used.

⇒ Open Register – registering the ship with a country that has more liberal fiscal and corporate legislation. Open registers registration are normally open to non-residents; have low or zero corporate tax rates; size of registered fleet disproportionate to the needs of the country; indiscriminate enlistment of foreign personnel; absence of facilities for enforcing international standards. The lower running costs associated with open registers provide a considerable inducement as does the more relaxed outlook on matters pertaining to crew's nationality, social and wage conditions. Often referred to as "Flags of Convenience".

⇒ Second Register or International Register or Parallel Register – established by a traditional Flag State and provides an alternative to Open Registers. This type of register offers substantial tax and social security contribution incentives, aimed at reducing the running costs of the ships. It also allows non-national manning and a fiscal regime that is usually beneficial to the operator/owner while allowing the state to have a degree of control over the ship.

⇒ Cabotage – is defined as "the reservation of a country's domestic shipping trades to ships flying the national flag of that state," and applies to coastal and deep-sea voyages, as well as shipments on inland waterways. Traditionally, most nations have applied some controls on commercial shipping engaged on their domestic trades. Ships engaged on cabotage trades have variously been required to be :

  i)   manned by the country's own citizens;
  ii)   wholly or majority owned by domestic nationals;
  iii) built at domestic shipyards; or
  iv)   registered under the country's national flag.

The reasons given for its application vary but tend to include the protection of a national flag fleet and the availability of ships if needed for defence purposes, and in the latter case some states give subsidies as an incentive to keep ships on the national register. Attitudes to cabotage differ from country to country. (Ref: 4)

⇒ Tonnage tax – Many Open Registers provide for a tax on the size of the ship (usually GT) and in some cases, if members of the crew of the vessel are Flag citizens, a percentage of the tonnage tax paid by that vessel may be refunded for each month they are employed on board the vessel.

In a growing number of traditional flag registers it is an alternative method of calculating corporation tax profits by reference to the net tonnage of the ship operated. Under a tonnage tax regime, the profits can be calculated on the basis of a specified profit per day according to the tonnage of the ship concerned. The standard corporation tax rate for trading income is then applied to the specified profit base.

⇒ Ship Sizes - Many ships are given general names to identify their carrying capacity:

Crude oil tankers:

ULCC   300,000 dwt plus
VLCC   150,000 to 299,999 dwt
Suezmax   100,000 to 149,999 dwt
Aframax   50,000 to   99,999 dwt

Dry bulk carriers:

Capesize   80,000 dwt plus
Panamax   50,000 to 79,999 dwt
Handymax   35,000 to 49,999 dwt
Handy   20,000 to 34,999 dwt
Review of Maritime Shipping UNCTAD 2001

Container vessels:

TEU – "twenty equivalent units" - a 20 foot container holds approximately twenty tonnes

<div align="right">**CASE STUDY A**</div>

EUROPEAN SHORT SEA OWNER / OPERATOR - EASTERN ENGLAND - 7th OCTOBER 2002

COMMENTARY

With a view to gathering, first hand, experience of a typical small size shipping company, the following information has been collected during the study.

The purpose is to include this Case Study as a real life situation and to consider relevant issues, particularly with an OECD theme.

THE COMPANY

Features, reported anonymously, are:

⇒ **The company** is a UK based Short Sea trader that has been in service for about eight years and presently operates six ships under ownership and one under management. The ships mainly trade (dry cargo) between UK and northern Europe. Two new vessels have recently been purchased.

⇒ **The office** staff (all UK citizens) consists of five management staff, four being full time and one part-time. In addition, there are three part-time administrative personnel.

The departments are functional based - ie Operations / Technical, Chartering, Personnel / ISM and Administration. The owner and the Personnel / ISM are ex-seafarers, with the majority of training being outsourced.

⇒ **The ships** were initially operated under the Bahamas flag but, after recent discussions with the UK MCA (Marine and Coastguard Agency), have now been registered under the British flag – reasons including:

● A move to a "friendly, home environment";

● Ease of administration, and;

● Avoidance of any ITF difficulties.

Note: The introduction of the UK tonnage tax was not a factor in the change of registry.

ON BOARD MANNING

The key features are:

⇒ The standard manning (which accords with the Safe Manning Certificate) is seven, comprising the Master, Mate, Chief Engineer, AB/Cook and three deck hands. The Master and Chief Engineer are Company employees with the remainder administered by a third party Crewing Agency. The UK hours of work regulations have not yet caused any difficulties, but, in line with the regulations, the position is continuously monitored.

⇒ Currently the vessels operate with, primarily, a combination of UK and Polish Officers (all OECD) and Polish Ratings – there are, however, a few Croatian Officers. There are considerations to exchange the Polish Ratings for Filipinos, and reasons given include concerns over the Polish EU entry, with expected increases in manning costs. The declining numbers of OECD people taking up a marine career are also causing problems.

TECHNOLOGY

The purchase of the recent ships was influenced by a number of factors - eg:

- No increase in manning levels, although the engines, purchased for efficiency and reliability, are of a size that require higher engineer qualifications than the remainder of the fleet.

- Efficient, economic and reliable equipment and layout for cargo work.

- In general, younger Officers are more IT minded, but all Officers cope with GMDSS. On most vessel runs, all crew use mobiles for verbal communications and connect to laptops for e-mail.

TRAINING

Key points to mention are:

⇒ The Company employs four UK Cadets throughout its fleet, but retention is difficult with a high initial drop out and post qualifications lure to other Companies. This situation, however, is similar among other Companies with a "liner" trade operation.

⇒ In general, it is felt that current training programmes are not preparing seafarers for the future – ie new technology is outstripping practice and training is falling behind. One example of this is that engine monitoring systems, installed in the new vessels, is a concept virtually unknown by seafarers who have not received any form of training in the system.

SUMMARY

This UK Company operates in the same manner as many small shipowners and this likely extends across a variety of OECD countries who, hopefully, can identify with this Case Study.

The owner anticipates an increasing Officer manning shortage in the future with particular concerns over the key positions of Master and Chief Engineer. For the foreseeable future, Officer positions will be filled by OECD or Central / East European personnel. A move to Far Eastern crews is anticipated quite soon.

Due to increasingly new technology, not complemented by on shore training facilities, much of the practical training may only be possible on board – achieved by various means – eg as an extra for an agreed period of time, serving a longer than usual overlap when reliefs takes place, etc. It is expected that training establishments will recognise this need to update their shore based training programmes.

5.   THE PEOPLE REVIEW

The following elements are addressed:

⇒ The expectations of ship owners and managers, and their appreciation of future changes in crew requirements that may be brought about by developments in the industry.
⇒ The impact of declining seafarer numbers on the operation of OECD fleets and skilled shore based maritime functions.
⇒ Seafarer perspectives on these issues.

Each is considered in separate detail under a series of sub headings, which all contribute to the people / manpower element of the study.

The key features, all of which to a greater or lesser extent impact on OECD seafarers, are:

⇒ Supply and demand data, both international and OECD;
⇒ Supporting manpower data, which includes crew complements, age profiles, inflows and wastage;
⇒ Information on wage factors;
⇒ Shore organisations, ie the shore based marine infrastructure;
⇒ The seafarer / union perspective;
⇒ The European Union.

A summary is included at the end.

5.1   INTRODUCTION

The Terms of Reference acknowledge that internationally accepted data is available, on a global basis, in regard to world seafaring numbers. An attempt is made, within this study, to refine where appropriate the global data to meaningful OECD statistics, and to project the information ahead over five to ten years. Before embarking on the raw material, an explanation regarding fleet manning / operations is provided.

5.2   INTERNATIONAL MANNING

The world trading fleet (of some 46518 ships in 2000) is manned on a global basis, with fleets being regarded as national flag or international flag. In many cases, irrespective of flag choice, seafarers of different nationalities may serve on either fleets (subject, of course, to appropriate SCTW '95 certification). A contrary position may be found in some countries (China for example) where, at the present time, only Chinese seafarers can be appointed to national flag vessels.

Note: for explanatory purposes, the fleet, for this purpose, is based on the Lloyd's database of the world commercial trading fleet, over 100 gross tons.

At the other end of the spectrum, two of the largest flags, Liberia and Panama, have virtually no national seafarers and almost their entire fleets are manned by international seafarers, many of the senior shipboard positions being filled by OECD seafarers.

The foregoing simplistic explanation renders it difficult to accurately determine the relationship between an individual country, its marine shipping base, and the corresponding size / demand for its own seafarers. It is for this very reason that the, now regular, production of the five yearly Baltic and International Maritime Council (BIMCO) and the International Shipping Federation (ISF) report is awaited with interest by the international shipping industry. This study now enables the best estimates to be made of labour trends, all on a collective global basis, specifically inflows, wastage and age trends.

5.3   SUPPLY AND DEMAND

5.3.1   BIMCO / ISF Data

The first BIMCO / ISF report was produced in 1990 and the most recent in 2000. These are thus the authoritative studies of the global supply and demand for seafarers.

Key data from the 2000 report, which is still regarded as broadly current, are shown below:

⇒   Global supply of Officers :   404,000   (4% shortage)

⇒   Global supply of Ratings :   823,000   (27% surplus)

Note: These figures are calculated directly from BIMCO / ISF individual country returns.

The total seafaring base is thus estimated to be 1,227,000. Added to this figure is the cruise / passenger group of 140,000 in the hotel sector, resulting in a global seafaring population of 1,367,000, or about 1.4 million, with forecasts of further growth.

The BIMCO / ISF 2000 Manpower Update, based on the agreed criteria of wastage, world trade, fleet size, etc, goes on to predict the position to 2010 and estimates (on the stated assumptions) the demand for Officers growing to 443,000 (an increase of 0.8% per annum) and for Ratings to 603,000 (an increase of 0.2% per annum). This again is on a world basis. In making these assumptions, the global number of vessels is expected to increase to 51,384 over the ten year period to 2010.

The graph shows the total world and OECD seafarer numbers for 1990, 1995 and 2000, separated out between Officers and Ratings.

It can be seen that OECD Officer numbers have been falling slowly, with OECD Rating numbers falling more rapidly as Companies switch to East European and Far Eastern crews.

World details also show both Officer and Rating supply numbers falling marginally.

Added to the graph are the BIMCO / ISF projected demand figures for the OECD and the world for the years 2000, 2005 and 2010.
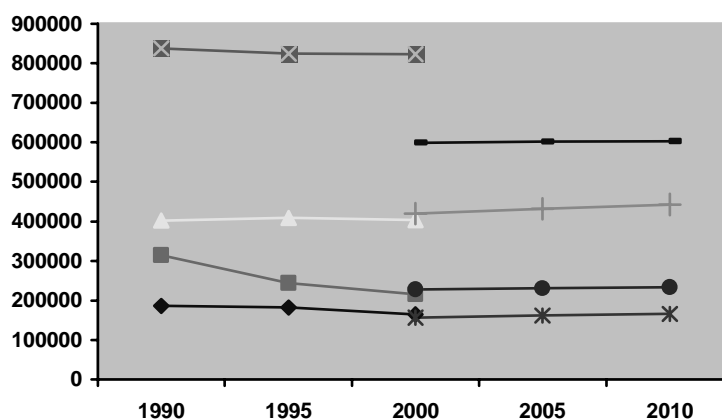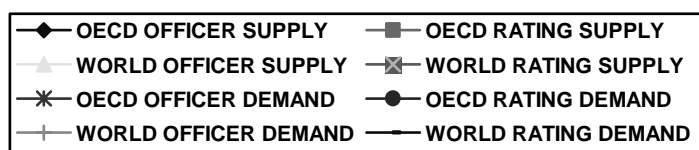
Source: BIMCO / ISF Manpower Reports - 1990, 1995 and 2000

As already stated, the numbers of OECD seafarers have been compiled by BIMCO / ISF over the ten year period 1990 to 2000. Within the Terms of Reference for this study, there is not a requirement to re-visit all the base material but, nevertheless, it is felt important to show the movement in labour sources (OECD) over the ten year spread, country by country, and these are shown in the table overleaf:

Note: Assumptions have been made in one or two cases where accurate figures have not been forthcoming - ie where no return was received by BIMCO / ISF from an individual country, a figure similar to the previous or following year has been used.

OECD Officer / Rating Supply - 1990, 1995 and 2000:

Country	1990 Officer supply	1990 Rating supply	1995 Officer supply	1995 Rating supply	2000 Officer supply	2000 Rating supply
Australia	2042	4070	1400	2000	1700	2400
Austria	15	25	397	711	397	711
Belgium	1508	1057	876	419	546	133
Canada	7070	12000	4557	10076	4557	10076
Czech Republic	288	634	206	483	206	483
Denmark	5500	7550	5600	5700	5353	4522
Finland	2800	4500	2020	2850	4000	6000
France	3460	8340	2210	3200	2030	4300
Germany	8190	14670	8391	6589	6021	8462
Greece	13400	23600	22000	18000	17000	15500
Hungary	227	453	245	415	782	1243
Iceland	277	332	225	245	225	245
Ireland	1430	2000	1452	2089	1452	2089
Italy	14500	17200	14500	17800	9500	14000
Japan	30715	36348	23788	18749	18813	12200
Korea	17568	29183	10416	10892	9506	6982
Luxembourg	27	29	655	595	514	465
Mexico	1885	4439	2000	4500	2280	4765
Netherlands	4985	2188	6097	1686	5707	5937
New Zealand	572	1261	830	900	448	605
Norway	9000	4320	13150	8850	12000	10200
Poland	6400	11700	5500	6500	5944	6162
Portugal	550	2200	764	2404	419	1802
Slovak Republic	37	67	37	67	37	68
Spain	6365	10422	4310	7264	4000	6000
Sweden	4330	4420	4462	4980	4500	5100
Switzerland	140	220	67	271	120	199
Turkey	9768	67130	15000	65000	14303	48144
United Kingdom	13204	15379	11000	12500	13285	10860
United States	20320	28031	20524	28787	19241	26837

Source: PAL / BIMCO / ISF Manpower Reports

5.3.2   OECD 2002 Supply and Demand Calculations

In 1990 and 1995, the BIMCO / ISF Manpower Reports have included a calculated demand figure for each individual country - this was not done for the 2000 update.

The consultants believe that there is a need to consider the demand figures for OECD seafarers, ideally at the present date. In addition, and for comparison purposes, it was felt appropriate to bring the likely supply figures up to date.

Calculations have therefore been undertaken for this study, based on the main vessel types, with consideration for leave, and other factors (known as back-up), to aggregate the total demand, and also to extrapolate the BIMCO / ISF supply figures to 2002, based on an expectation of an overall annual falling OECD seafarer supply.

The following table shows the likely position for 2002 embracing, on an individual OECD country basis, the total number of ships over 100gt on national registers, calculated demand and supply figures for both Officers and Ratings, together with an indication of any excess or shortfall.

It is emphasised that this is very much a theoretical calculation and care should be taken when drawing any individual country conclusions. It does, however, show the unlikely position of all national flag vessels being manned with all national seafarers - this does not happen. In theoretical terms, if this were the case, the current supply would be just under two thirds of the number required.

Even when considering the overall supply numbers, there is nothing to suggest that the skill levels required for individual vessel types is matched by relevant supply numbers of seafarers.

The BIMCO / ISF 2000 Report also indicates that ship numbers are increasing and that OECD national seafarers are decreasing - this latter comment being borne out by the responses received during the research of this project. It is, obviously, unrealistic to expect a return to a national flag / national crew

situation. Indeed, the results of this study further confirm that a number of OECD companies have already taken the decision, mainly due to cost and availability factors, to switch to other nationalities for their vessels. In this respect, there is reported to be, generally, a greater availability of non OECD seafarers - eg 180,000 Filipino Ratings available for service on international vessels.

By the same token, it must be remembered that many OECD Officers, particularly Senior Officers, serve on non OECD registered vessels.

Calculated OECD Supply / Demand - 2002:

Country	Total Ships	Officer Demand	Officer Supply	Officer Excess / Shortfall	Rating Demand	Rating Supply	Rating Excess / Shortfall
Australia	196	3,842	1,617	-2,225	4,967	2,290	-2,677
Austria	25	340	378	+38	368	678	+310
Belgium	11	181	519	+338	251	127	-124
Canada	332	6,088	4,334	-1754	7,476	9,613	+2,137
Czech Republic	0	0	196	+196	0	461	+461
Denmark	94	1,885	5,091	+3,206	2,344	4,314	+1,970
Finland	187	3,419	3,804	+385	4,247	5,724	+1,477
France	230	4,575	1,931	-2,644	5,881	4,102	-1,779
Germany	690	11,641	5,726	-5,915	14,102	8,073	-6,029
Greece	1,316	24,481	16,167	-8,314	32,482	14,787	-17,695
Hungary	0	0	744	+744	0	1,186	+1,186
Iceland	16	308	214	-94	391	234	-157
Ireland	44	729	1,381	+652	855	1,993	+1,138
Italy	929	17,999	9,035	-8,964	23,704	13,356	-10,348
Japan	4,807	77,554	17,891	-59,663	98,635	11,639	-86,996
Korea	982	15,773	9,040	-6,733	19,979	6,661	-13,318
Luxembourg	52	1,248	489	-759	1,842	444	-1,398
Mexico	124	1,861	2,168	+307	2,238	4,546	+2,308
Netherlands	722	12,373	5,427	-6,946	15,151	5,664	-9,487
New Zealand	33	795	426	-369	1,105	577	-528
Norway	889	16,085	11,412	-4,673	19,397	9,731	-9,666
Poland	97	1,577	5,653	+4,076	1,910	5,879	+3,969
Portugal	59	1,018	398	-620	1,252	1,719	+467
Slovak Republic	3	43	35	-8	46	65	+19
Spain	198	3,542	3,804	+262	4,347	5,724	+1,377
Sweden	368	6,648	4,280	-2,368	8,601	4,865	-3,736
Switzerland	21	308	114	-194	354	190	-164
Turkey	1,014	16,208	13,602	-2,606	19,747	45,929	+26,182
United Kingdom	642	11,961	12,634	+673	15,306	10,360	-4,946
United States	1,181	15,886	18,298	+2,412	16,221	25,602	+9,381
OECD Totals	15,262	258,368	156,808	-101,570	323,199	206,533	-116,666

Source: PAL

5.3.3   Comments

From industry information and from an understanding of the international manning scene, but with a particular focus on OECD countries, the following general comments are made:

- By and large, and due to the nature of the industry, as already explained, any shortfall in OECD manning will be overcome by owners / managers, through alternative sources in either Central / Eastern Europe, or the Far East. Experience dictates that, for senior Officers, a focus of supply will be increasingly from Central and Eastern Europe, and the Philippines, in particular, will provide the main crew Rating numbers.

- A separate commentary is included, regarding age profiles, but as a general statement, information from the BIMCO / ISF report suggests that relatively few Officers from the Far East, or Indian subcontinent choose to remain at sea after the age of 50. This, of course, will impact in the future, particularly as, potentially, the industry at large will face serious problems, compounded through OECD Officers reaching "normal" retirement age, whilst Far East Officers will be retiring early.

- Later in this chapter (5.9), the shore based marine infrastructure is referenced in detail, but it will be recognised it still relies, heavily, on former "mariners" to fill many office related positions. Evidence is suggesting, however, that, certainly in the case of OECD personnel, there is a growing reluctance to come ashore, for a variety of reasons, these being:

⇒ In the case of senior Officers, more and more are serving on a "one on, one off" basis, in effect relating to six months work in a year. This gives stability of home life, often not found ashore, and certainly in the superintending ranks.

⇒ Some seafarers now find that the employment package working ashore may be less attractive than at sea, particularly where benefits of tax may be a government feature of sea going employment.

⇒ Mariners can, at random, choose their place of domicile - this is not the case in the shore going environment, where the Officer of the Company dictates place of work.

5.4   CREW COMPLEMENTS

This topic is also covered under the Technical Review but, in terms of the people perspective, on board manning numbers can be influenced by the following circumstances:

- The flag state Safe Manning Certificate

- An owner's choice, which may be influenced by such things as additional numbers, for maintenance work, passenger support service, etc.

- An industrial manning scale, which may include the need for union approval.

- Other criteria, ie trade requirements, hours of work / rest regulations, etc.

Manning numbers have always been a high focus of attention and the moves, over a number of years, to single bridge watchkeeping, semi automated vessels, and in some cases the virtual elimination of on board numbers, have been well reported. Nevertheless, current statistical information shows that, over the last ten years, or so, there has only been a gradual reduction in numbers, principally through the removal of the Radio Officer and catering reductions, and also the elimination of junior ranks of Engineers, (through unmanned engine spaces). Two examples are shown:

Rank	1994 numbers	2002 numbers
Master	1	1
Chief Officer	1	1
2nd Officer	1	1
3rd Officer	1	1
Radio Officer	1	
Chief Engineer	1	1
2nd Engineer	1	1
3rd Engineer	1	1
4th Engineer	1	1
Electrician	1	
Bosun	1	1
Fitter	1	2
Pumpman	1	1
AB	3	3
OS	1	3
Motorman	2	2
Wiper	1	
Chief Steward / Cook	1	1
2nd Cook	1	1
Messman	2	1
Total Officers	10	8
Total Ratings	14	15
Total Complement	24	23

TANKER - MEDIUM PRODUCT - WORLDWIDE TRADING

Source: Drewry Ship Operating Costs

Annual Review and Forecast

BULK CARRIER - 9,000 GT - WORLDWIDE TRADING	Rank	1994 numbers	2002 numbers
	Master	1	1
	Chief Officer	1	1
	2nd Officer	1	1
	3rd Officer	1	1
	Radio Officer	1	
	Chief Engineer	1	1
	2nd Engineer	1	1
	3rd Engineer	1	1
	4th Engineer	1	
	Electrician	1	1
	Bosun	1	1
	Fitter	1	1
	AB	3	3
	OS	2	1
	Motorman	2	2
	Chief Steward / Cook	1	1
	Messman	2	1
	Total Officers	10	8
Source: Drewry Ship Operating Costs	Total Ratings	12	10
Annual Review and Forecast	Total Complement	22	18

Evidence collected during this study, from ship owners, seafarers and other authoritative bodies, indicate that further manning reductions, certainly in current vessels, are unlikely and, even if they are to take place, will be small, rather than significant, changes. This is also borne out in a supplementary annex to the BIMCO / ISF Manpower 2000 Report, where it is quoted.

Quote

"A large majority of companies disagreed that manning levels, either for Officers or Ratings, were likely to decrease substantially.

While some companies conceded that growth in the use of dual certificated Officers might effect a small reduction in manning, this appeared to be outweighed by the effects of the new international work hour regulations, expected additional requirements such as the need to conduct deep sea ballast water exchange, and a general feeling that any significant further reductions would have a detrimental impact on maintenance and operating costs which would outweigh any savings in wages. In the event that there were some unexpected technical advances, these were generally thought likely to be very expensive and of little relevance to the majority of ships already constructed."

Unquote

Source: BIMCO / ISF 2000 Manpower Update

The conclusion is therefore reached, that over the period of the study for five to ten years, there will be insignificant impact on fewer on board manning reductions - certainly in current vessels.

5.5   AGE PROFILES

A key feature in any manpower plan, which relates to availability, inflows, career positions and, ultimately, retirement, is reliable data on the age population of an agreed block of employees. Clearly, within the parameter of this study, it is not possible to provide new data and therefore there is a reliance on that in the public domain, or privately held by the team of consultants. Relevant information is thus:

● The BIMCO / ISF Manpower Update indicated an average age of 43.7 years, for OECD Officers at 2000 - this clearly will have extended since. This relevant extract is shown below:

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AGE STRUCTURE OF OECD EMPLOYED WORKFORCE							
Percent of Number in Category							
	Under 20	**20 - 25**	**26 - 30**	**31 - 40**	**41 - 50**	**51 - 55**	**Over 55**
Officers	0.4	5.7	9.4	18.8	27.5	24.0	17.8
Ratings	3.1	9.5	12.3	20.5	31.8	15.8	7.1

Source: BIMCO / ISF 2000 Manpower Update

Other relevant (BIMCO / ISF) data is:

⇒ Over the period 1990 to 2000, the number of Officers from OECD countries, aged over 55 years, increased from 5,800 to 26,000. A further proportionate increase will have taken place over the last two years.

⇒ Based on the same assumptions, the stock of current OECD Senior Officers will decrease, through retirement, by about 20% over the next 5 years.

● A UK Industry Manpower Survey Report of 2001 indicated an average age of 41.3 years, for Deck Officers, and 40.5 years for Engineer Officers.

● Interestingly, the seafarer questionnaire for this study primarily referenced at senior Officers, who indicated a commencement date of their career, of 19, which has been followed by a further 20 years at sea, with an expectancy of a further 12. Whilst this is not a precise measure, it would appear to indicate a career profile which might extend between the ages of 50 and 55, the latter being a standard retirement date.

● From the above, it can be seen, that OECD Officers, particularly in the senior ranks, are an ever ageing workforce, which will result in the near future to a lack of experience in the labour market. It will be many years before this situation will change.

● One slightly positive feature is that it is known that certain OECD Officers will work beyond a standard retirement age, subject always to medical fitness.

5.6   INFLOWS

The future supply of seafarers depends on the two measures of inflows and wastage.

Inflows can be loosely referred to as new stock to the supply market and can add numbers to the present availability through a number of ways.

Note: Outflows, or wastage, may of course be a higher figure and thus inflows can, in effect, be a negative overall value.

● The prime input to the industry (both Officers and Ratings) is through new trainees, with the main focus being on Cadet numbers, this being the recognised new entrant route for Officers.

● Small numbers of inflows can join from alternative sources such as ex naval personnel and other professional ranks, including engineers and electrical staff.

● For the ever growing passenger cruise market, inflows will be especially dominant in the catering and hotel services.

● Finally, and in respect of Officers, the inflow base can be increased by those Ratings who aspire to improve their qualifications and skills to service in the Officer ranks. Naturally, their movement from Ratings to Officers will result in a reduction in Rating numbers but, as there is customarily a surplus of Ratings, any upward movement will jointly benefit the total seafaring supply stock.

Individual OECD country inflow numbers are not included in this report but collectively commentary, primarily based on the BIMCO / ISF 2000 Manpower Update, is relevant. Key features are:

⇒ Over the period 1995 to 2000, Officer trainees, in the OECD, increased as a percentage of Officer stock, from 5.3% to 11.9% - in effect, a doubling - most positive.

⇒ Similarly, the OECD Officer trainee numbers for the same period of 1995 to 2000, when measured against the global figure, almost doubled from 15.7% to 29.9% (of interest is that Eastern Europeans declined by about the same percentage).

⇒ It can not be ignored that the percentage of trainees leaving their courses each year, is higher in the OECD than elsewhere, this being a figure of 13.4%, which has a negative Officer supply outcome.

⇒ Finally, it is recognised that the ideal inflow / recruitment levels should be one trainee per seven Officers, which can be shown, in another way, as 1.5 trainees per ship throughout the year.

5.7   WASTAGE

In any people review, accurate and meaningful statistics on wastage (ie the number of people who leave a Company) are difficult to obtain and any information needs to be carefully judged. There are various interpretations on wastage data and Companies have their own methods / style which may, of course, differ from other Companies - eg it may refer to:

● Wastage of a seafarer from one shipping Company to work for another shipping company - ie Company wastage.

● Wastage from a seagoing career to a shore based marine career – ie Company transfer (or wastage if the "transfer" is to a different Company).

● Normal retirement (this is especially pertinent, given the age profile of OECD seafarers).

● Wastage due to ill health retirement or death of a seafarer.

Note: OECD member countries may have different interpretations from those shown above.

Within the constraints of time / knowledge, it is not possible to report, with any sound data, on wastage across individual OECD countries, therefore this is examined on a collective (30 countries) OECD basis.

Additionally, and with a view to reporting wastage on a like for like basis, the following is taken from the BIMCO / ISF 1995 and 2000 Manpower Update, as all data was received via a customised questionnaire.
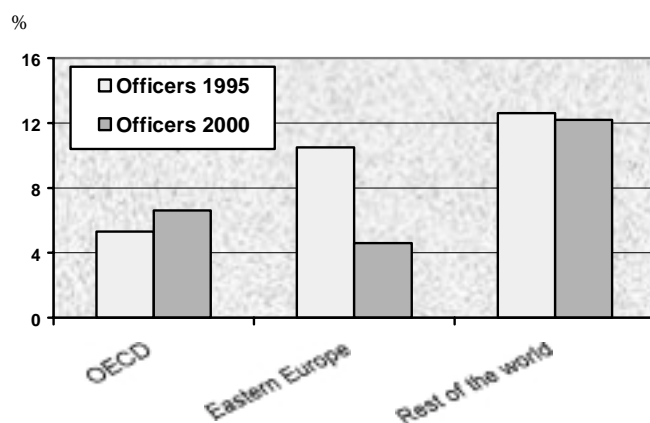
As can be seen, for Officers, the overall level of global wastage has reduced, although OECD wastage in 2000 has increased over 1995.

Of particular significance, the 2000 wastage rates from Eastern Europe are less than half the level of 1995.

Wastage from the rest of the world, however, for both 1995 and 2000 has remained almost the same.

Source: BIMCO / ISF Manpower Reports

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When considering the Rating position, the following applies:

Similar to the Officers, the overall level of global wastage for Ratings has reduced, over the 1995 to 2000 period, including OECD wastage.

Of particular significance, the OECD 2000 wastage rates are 7% less than in 1995.

Wastage for 2000 from Eastern Europe is almost that for 1995, with 2000 wastage from the rest of the world reduced by 20% over 1995.
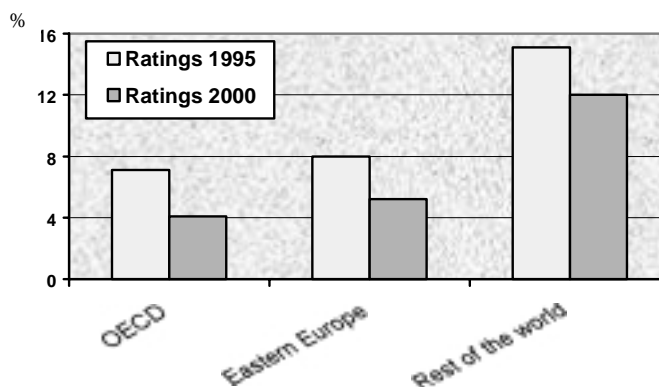
Source: BIMCO / ISF Manpower Reports

5.8   WAGE FACTORS

In any study regarding the human element, and especially where there is an international open / competitive labour market, wages cannot be ignored - this is therefore addressed in this sub-heading. Only a general explanation is provided, but significant messages outflow, as will be shown.

Internationally, the standard measurement for Ratings as regards the base employment cost for an owner or manager will relate to ITF levels. However, for Officers, especially the senior ranks, market rates (which will be in excess of ITF rates) will generally apply – this being the effect of supply and demand and, as important for some countries, the general seafarer wage level within the country of domicile.

OECD seafarers, as shown in the Technical Review, serve in quite large numbers in tankers and thus, for wage purposes, tanker rates (which are generally higher than dry cargo) are referenced here.

Using the ranks of Master and AB as examples, the ITF monthly costs, covering basic wages, vacation and overtime, are:

⇒   Master   US$ 4,080

⇒   AB   US$ 1,300

These are referenced in the table as Grade B benchmark rates.

On an escalating scale, based on 25% wage band differentials from the benchmark rate, the following table has been created, identifying where the relevant nationality wage scale fits into the various bands (a selection of OECD countries are highlighted in red):

	Master	Countries	AB	Countries
Grade A	< $4080		< $1300	
Grade B (Benchmark)	$4080		$1300	Croatia : India : Philippines : Poland : Russia : Ukraine
Grade C	$4081 - $5100	India : Philippines : Russia : Ukraine	$1301 - $1625	South Korea
Grade D	$5101 - $6120	South Korea : Croatia	$1626 - $1950	
Grade E	$6121 - $7140	Greece : Poland : Spain	$1951 - $2275	
Grade F	$7141 - $8160	Italy : The Netherlands	$2276 - $2600	Greece : Italy
Grade G	$8161 - $9180	Germany : UK	$2601 - $2925	Germany : The Netherlands : Spain
Grade H	> $9180	Denmark : France : Japan : Norway	> $2925	Denmark : France : Norway : Sweden : UK

Source: PAL

It can be seen from the above that OECD rates of pay are nearly all in excess of the rates of pay for other major non OECD seafaring supply countries, thus, whilst ship owners / managers may prefer, for reasons of quality, skills, etc, to utilise OECD seafarers on their vessels, the cost of these seafarers increases, considerably, the manning budget.

This factor, linked to the age profile of OECD seafarers, makes them an expensive and ageing workforce and considerable thought is thus needed to determine the longer term future, if any, of OECD seafarers.

5.9   SHORE ORGANISATIONS

A specific task within the Terms of Reference is the requirement to cover the following element: "the impact of declining seafarer numbers on the operation of OECD fleets and skilled shore based maritime functions".

The reliance on seafarers to fill key maritime roles ashore is well known, with research having been undertaken in different maritime countries. However, the impact on the OECD as a whole is, it is believed, a wider dimension and thus the programme of research was undertaken as follows:

⇒   The need to establish a database of shore organisations where, potentially, there is a marine related skill / experience requirement.
⇒   The need to obtain opinions from a selection of current shore employers.
⇒   The seafarers themselves.

Some conclusions are also included, together with case Study B.

5.9.1   The database

Through detailed investigatory work, based on information from Lloyd's Register, and individual country material, the attached table has been prepared, which shows the number of OECD companies and organisations working in the shipping industry. This table is in simple matrix format, with the list of OECD countries on the left hand side and the corresponding organisations on the other vertex. The following comments are made:

●   The research indicates there is an OECD total of 34,683 marine based organisations, across OECD countries, which, as a percentage of the world total, is 65.2%.

●   The separate categories have been prepared by the consultants and will give an in depth overview of the supporting marine infrastructure on which the industry relies.

●   All 30 OECD countries have, to a greater or lesser extent, shore organisations, and in the form of a league table, those countries where there are more than 1,000, are shown below:
United States of America
 United Kingdom
  Japan
   Germany
    Greece
     Norway
      Italy
       Netherlands
        Spain
         Australia
          Canada
           France

●   Individual marine activities, again in league table format, for those functions where there are more than 500, are shown below:
Japan
 Greece
  United States of America
   United Kingdom
    Norway
     Germany

●   The scale of these activities can be shown in the attached graph.

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Number of OECD Companies and Organisations working in the Shipping Industry

	Ship Operators	Ship Managers	Marine Insurance	Ship Finance	P&I Clubs	Ship Brokers	Charterers	Maritime Lawyers	Marine Equipment	Engine Builders	Classification Societies	Shipbuilders & Repairers	Port Towage	Port Authorities	Port Operators	Pilotage Authorities	Towage & Salvage	Bunkers	Maritime Organisations	Maritime Schools	Consultants & Surveyors	Port Agents	Country Total
Australia	162	17	10	9	2	19	10	61	204	19	31	65	39	62	85	13	27	36	61	16	27	304	1279
Austria	9	2	1				2	1	54		5								2	1			77
Belgium	76	6	14	5		8	12	33	98	3	9	16	5	7	45		11	7	34	7	11	145	552
Canada	163	21	15	3		38	22	80	267	23	24	50	19	73	115	2	9	29	29	24	9	192	1207
Czech Republic	1	1	2			1		1	21	3	6	3											39
Denmark	216	19	1	4	3	34	14	4	225	19	11	32	22	76	34	1	4	14	13	10	4	136	896
Finland	82	7	4	4		14	5	13	195	10	10	22	6	46	35	1	3	10	9	10	3	105	594
France	135	7	25	6	1	27	13	40	273	18	32	47	18	60	61	4	10	10	26	9	10	282	1114
Germany	540	39	15	22	2	62	23	47	661	49	30	104	29	54	96	2	18	48	20	7	18	142	2028
Greece	1042	71	16	26	7	160	17	76	146	16	32	62	3	52	22		18	11	26	11	18	127	1959
Hungary	4					1		2	8	1	6												22
Iceland	74	1				4	1		17	2	5	7	1	24					6	2		24	168
Ireland	59	1	2	2		5	1	13	32	3	7	9	6	34	18		5	16	13	5	5	98	334
Italy	321	21	11	3	2	37	20	53	270	23	45	61	12	84	112	4	21	26	19	1	21	439	1606
Japan	1565	17	18	12	8	15	34	12	351	63	42	192	8	149	40	1	11	4	54	12	11	117	2736
Luxembourg	6			4	3		1	1	7	1	1								1				25
Mexico	57	3	2		3	6	2	8	28	2	13	10	3	26	6		3	9	1	2	3	107	294
Netherlands	338	48	18	21	4	52	11	18	531	31	18	118	21	25	42	2	36	44	38	19	36	103	1574
New Zealand	53	7				8		18	40	3	13	9	6	23	16	3	3		24		3	107	336
Norway	682	44	13	22	9	67	19	14	437	21	14	110	20	74	41	3	28	37	26	10	28	173	1892
Poland	42	26	4			30	2	8	151	12	37	48	3	9	43	1	3	9	10	10	3	49	500
Portugal	50	4	2	2		3	5	6	64	4	11	14	11	10	42	1	3	6	7	1	3	142	391
Slovakia	1						1		8		3	1											14
South Korea	270	7	4	1	1	20	20	2	151	19	38	42		15	3		5	1	16	4	5	27	651
Spain	227	15	3	4	2	40	6	38	213	15	34	58	22	57	86	2	21	28	46	5	21	395	1338
Sweden	193	11	3	5	2	21	9	13	257	13	19	35	14	81	33		3	9	13	11	3	126	874
Switzerland	60	11	3	11		9	12	4	83	4	4	2	1	1				1		11		1	5	223
Turkey	302	20	25	10		28	11	26	76	12	14	61	3	50	39		7	11	17	6	7	94	819
United Kingdom	644	91	103	77	23	192	40	174	1903	110	64	222	86	183	275	9	91	115	210	102	91	640	5445
United Sates	772	70	60	58	5	158	81	558	1323	84	88	323	188	226	427	11	69	141	104	52	69	829	5696
OECD Total	**8146**	**587**	**374**	**311**	**77**	**1059**	**394**	**1324**	**8094**	**583**	**666**	**1723**	**546**	**1501**	**1716**	**60**	**410**	**627**	**832**	**335**	**410**	**4908**	**34683**
World Total	1306 1	1203	646	426	108	1521	560	1885	10380	883	1414	2595	669	2812	2643	74	634	1013	1218	483	634	8281	53143
OECD %	62.0%	48.8%	57.9%	73.0%	71.0%	70.0%	70.0%	70.0%	78.0%	66.0%	47.0%	66.4%	81.6%	53.0%	65.0%	81.0%	65.0%	62.0%	68.0%	69.4%	65.0%	59.0%	65.2%

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OECD Project

Total Number of Shipping Related Companies in the World and in OECD Countries

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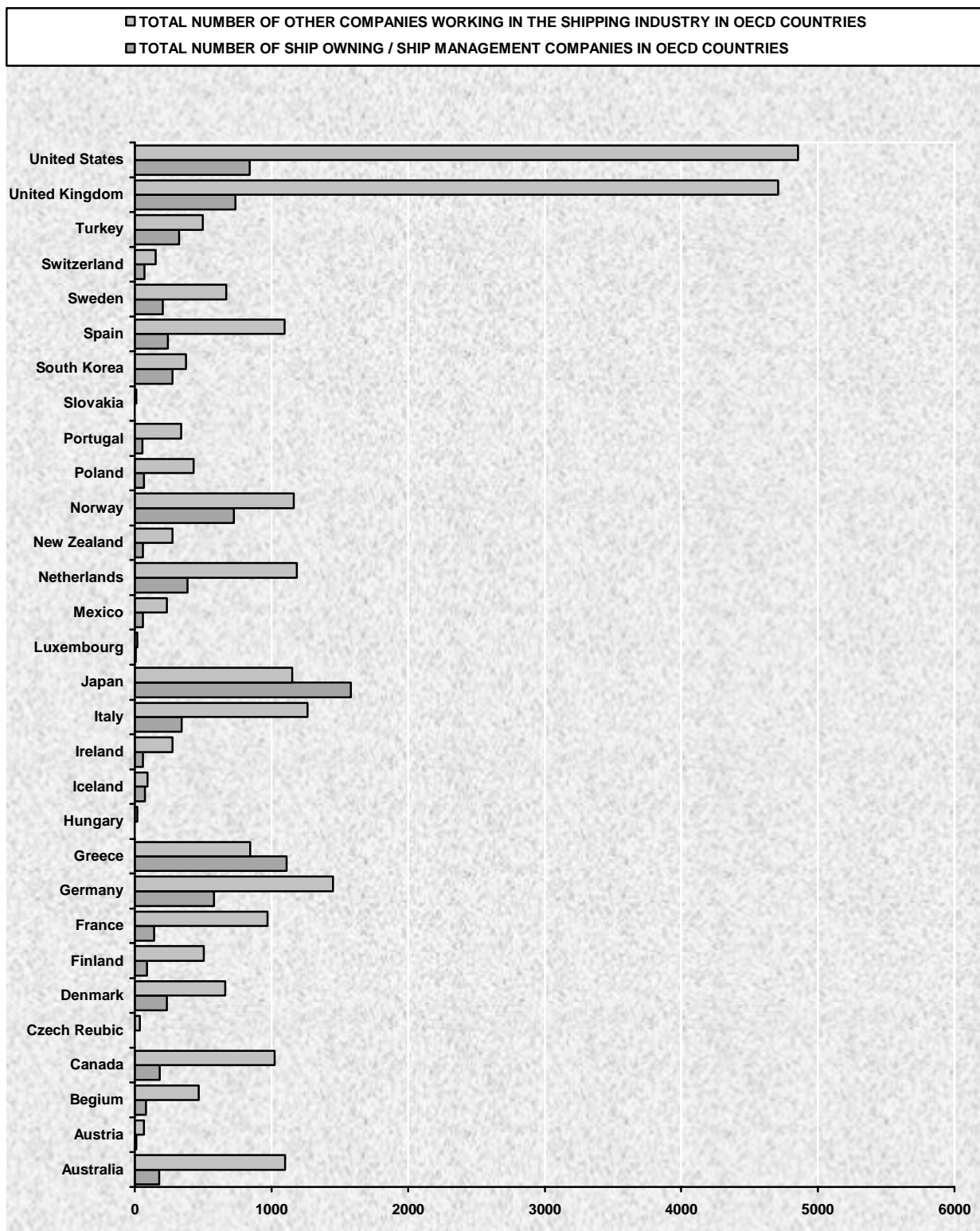
The following opinions have been formed:

⇒ The scale of the shore infrastructure of OECD countries is significant. This is further compounded when it is realised that more than 65% of the global shore infrastructure is based in OECD countries, with the consequent reliance on marine expertise and skills.

⇒ There is a corresponding (ie 60+%) reliance on OECD ship operators, compared to the world figure. In effect, it can be seen that control and direction of a major part of the world trading fleet is held within OECD country boundaries.
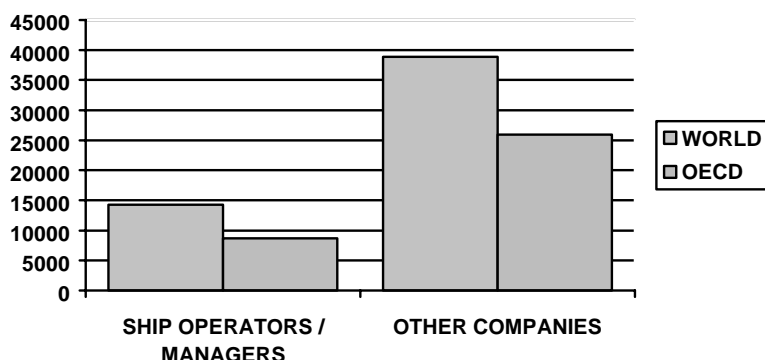
The graph shows:

The relationship between the number of world ship operating / ship management Companies and the number of OECD ship operating / ship management Companies.

Similarly, the relationship between other Companies working in the shipping industry on a worldwide and OECD basis.

Source: PAL

⇒ Further, even more significantly, statistics show that as regards marine equipment, almost 80% of organisations, relative to the world, are based in OECD countries.

⇒ It will be shown, shortly, that there is a major reliance on marine skills, to work in such companies, and hence the impact on the seafaring population is of major importance.

5.9.2 Shore Employers

➡ Across all the various groups and questionnaires (as listed below), a common theme was the employment, within the shore organisations, of former seafarers and, more specifically, OECD former seafarers. The following table and graph show the overall position with regard to the OECD element:

OECD Group	Average % Former OECD Seafarers Working Ashore
Marine Training and Development Organisations	65%
Ship Owners / Technical Departments	54%
Ship Owning / Ship Management Companies	47%
Shipowners' Organisations	35%
Marine Shore Groups	16%
Ship Builders / Equipment Manufacturers	4%

Source: PAL
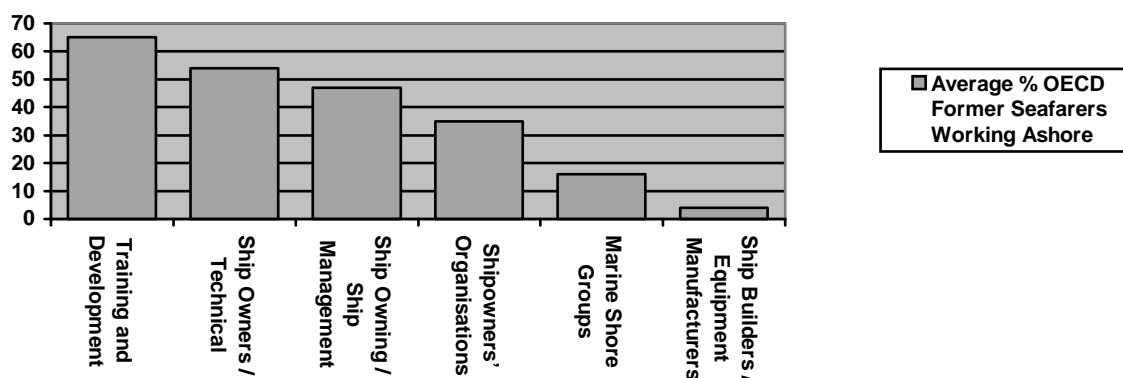
➜   With a view to obtaining current information and opinion, from a range of supporting shore organisations (ie excluding ship owners / ship managers), a specially created questionnaire was issued to a random choice of OECD based Companies / organisations, who provide a service to the Shipping Industry and who, potentially, may employ ex seafarers - the organisations included flag states, international shipping regimes, pilotage authorities, insurance, port companies and consultants. Questionnaire 7 in the appendix details both the questionnaire and the summary outcome.

More than 20% of respondents replied to the questionnaire and key points to emerge from the detailed analysis are:

- Former seafarers make up 17%, on average, of the shore organisations, with the OECD figure being 16%.

- Respondents believe that the future requirement / dependency on seafarers will broadly stay the same (40%), with the remaining 60% being equally divided as to whether the requirement would increase or decrease. In regard to non OECD seafarers, it is believed there will be an increase (perhaps reflecting the expected decline in numbers of OECD staff).

- The requirement for ex seafarers is based on their practical ship board experience, their technical experience and, to a lesser extent, their personnel experience.

- In the expectancy that the supply of ex seafaring OECD personnel will decline, respondents indicated that they will then need to recruit / increase the number of non OECD personnel and, also, look wider afield, to ex naval personnel. Smaller numbers will also train non seafaring staff, with new marine skills.

- Companies had mixed views regarding the output of marine training establishments with, at one extreme, 70% stating negatively, as regards college establishments imparting operational knowledge although, more positively, 60% reported on positive aspects regarding staff handling, client relationships, etc.

- With a view to gaining first-hand experience, from one marine law firm, a case study was developed, which is shown as an attachment here, and is believed to be self explanatory. In effect, this confirms the views reported above.

5.9.3   Seafarers

It is recognised that, at present, marine skills being brought ashore, can mainly flow from seafarers and thus the consultants, as part of the seafaring perspective aspect of the study, included relevant questions regarding their shore preparation. The outcome is shown in questionnaire 5 and key features, relative to the shore infrastructure, are now summarised:

- 80% of the seafarers, mainly in the senior ranks, confirm, if they were to come ashore, they would like their career to continue within the marine industry.

- Correspondingly, 70% believe that their training and experience, to date, on board ship, has prepared them for a career within the industry. (Negatively, 30% do not believe that they have been sufficiently prepared to come ashore).

- For many years, the industry has discussed a long term marine career, which includes both sea service and periods ashore in the office, on a continually rotating basis. 73% of the seafarers (again, mainly senior ranks) confirm that they believe it should be possible to develop such a career path.

5.9.4   Conclusions

⇒   For some considerable time yet, there will be a requirement for specialised marine skills ashore to be provided by ex seafarers. In the event that OECD personnel are unavailable, then clearly the need can be resourced from elsewhere, ie the Far East, Central and Eastern Europe.

⇒   Alternatives for the future can clearly include (shore) marine graduates, who can receive on board training in the form of a series of modules, related to their special discipline.

⇒ It is believed that a separate EU study is taking place, relative to the availability of former naval personnel, specifically in the Baltic States, and there would appear to be no reason why some use can not be made of such personnel, within the merchant marine establishment.

5.10   THE SEAFARER / UNION PERSPECTIVE

The study, quite correctly in the view of the consultants, emphasised the need for the seafarers perspective to be taken into account on the relevant issues.

In planning the programme of work, it was agreed that input would best be gained in the following ways:

▪ Meeting, face to face, with a group of Officers and Ratings.

▪ A specially designed seafarer questionnaire.

▪ A dialogue to take place with at least one seafarer union.

The outcome, which now follows, is in line with the above plan and includes Case Study C.

5.10.1   Meeting with seafarers

Through the kind co-operation of a shipping company (of OECD nationality) and their appointed ship manager (a different OECD nationality), the two person consultant team spent a period of five hours on board a modern Ro-Ro ferry, with a variety of OECD nationals as the on board complement - the welcome and subsequent interest and assistance in the project has added value to this study.

The ship visit programme is included, in its entirety, as a case study which, it is believed, is self explanatory and stands alone in its outcome. The consultants fully acknowledge that only this one ship visit took place and thus a different set of conclusions could well have emerged from a visit to a different ship type, operating with other OECD national seafarers. Nevertheless, the report is factual and, when later reviewing the seafarers' questionnaire (to follow shortly) there are a number of similarities.

The consultants are also well experienced in meeting with seafarers and thus express confidence in the manner in which the case study is written and the contents therein – ie it is a fair representation of time spent on the vessel.

5.10.2   Seafarer questionnaire

Again, through the kind assistance of shipping companies and unions, representing the dry cargo and tanker sectors (and others not identified), questionnaire returns have been received by the consultants, some directly from the seafarers. Whilst the seafarer respondents were not specifically requested to divulge their nationality, it is nevertheless believed that returns have been received from the following groups:

▪ British
▪ Danish
▪ Irish
▪ Italian
▪ Polish
▪ Swedish

The analysis of questionnaires is detailed, with much opinion from the seafarers. The main outcomes are shown here in summary format:

⇒ 70% of respondents report that their training and experience has prepared them for a career ashore within the marine industry.

⇒ Similarly, 80%, if coming ashore in the future, would like their career to continue within the marine industry.

⇒ 88% believe their career has followed their expectations.

⇒ Three quarters believe that the status and image of a seafaring career must be improved.

⇒ 60% of Officers (and 77% of Ratings) consider that the training of seafarers in their country is inadequate. Management practises and engineering knowledge are reported as those areas where extra skills are required.

⇒ 85% of seafarers believe that ships should continue to be manned in the standard format of deck, engine and catering departments. Similarly, 100% believe that the on board structure of Officers and Ratings should continue.

⇒ Three quarters of seafarers believe it should be possible to plan and develop a long term marine career, which embraces both sea service and shore based employment.

⇒ The main attractions of a seagoing career are seen as pay and conditions, job satisfaction independence and attractive career prospects.

⇒ The drawbacks of a seagoing career are seen as the poor image, little / no job security, limited social life and lack of recognition from shore management.

⇒ The impact of IT is seen both positively and negatively - eg greater communications, but (on occasions) increased pressure from shore organisations.

In summary, seafaring would benefit from an enhanced industry image, thereby helping to ensure sufficient numbers of new trainees for the future.

5.10.3 Seafarer Unions

Within the international labour market, it is believed there is a strong union presence - this is a feature of many forms of transport (rail, road, airline, etc) and shipping is no exception.

The view was thus taken that some union input, even limited in scope, would be essential and the consultants discussed and solicited views from a Danish union, with input also sought from two UK unions - unfortunately, time prevented an in depth exchange of views taking place with the latter.

Based on a dialogue with the Danish seafarers union, and including the seafarers marine knowledge, the following is reported:

⇒ There appears to be appreciation / understanding of the OECD study, with encouragement (from the union) to obtain seafarers replies.

⇒ Concerns exist (by the unions) that the ever reducing labour market of OECD (including for this purpose, EU seafarers) will decline even further, unless urgent measures are taken.

⇒ The benefits of "state aid" are valuable and should be extended / utilised to their maximum.

⇒ All efforts must be made to encourage greater numbers of young people to join the industry.

⇒ Press mention is made of the EU initiative, aimed at reversing the decline in the maritime skill base; this has been discussed at the recent Maritime Industries Forum, in Naples, at which unions were prominent.

5.11   THE EUROPEAN UNION AND OTHER INTERNATIONAL ORGANISATIONS

It is difficult, within a study of this nature, not to draw some comparisons between the OECD and other international organisations, particularly the EU. Indeed, one of the challenges for the authors of this Report is to separate out the common interests of all OECD member countries, always being mindful that there is much similarity in many of the countries, as shown in the matrix of the OECD members overleaf.

A few supplementary words, related to the EU, now follow:

● The EU, which started as an open, free trading association, has, in the views of many observers, changed dramatically, to its current role, which has features of common currency, legislative measures, fiscal policy, and the like.

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- Ten countries are due to join the EU, in early 2004, the respective ones being Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia - there is still no date for the admission of Turkey.
- The consultants are not aware of the relationship, if at all, between the Marine Administrations of the OECD and the EU - however, it would appear that some benefit can be gained by commonality of marine aspects, particularly where a member country is both in the EU and the OECD.

Country	Organisation for Economic Co-operation and Development	European Community Shipowners' Associations (ECSA)	European Union	North American Free Trade Agreement	Memorandum of Understanding on Port State Control	International Maritime Organisation	United Nations Conference on Trade and Development	International Labour Organisation	World Trade Organisation	Currency	OECD Statistics on International Trade in Services	Asian-Pacific Economic Cooperation
Australia	x				Tokyo	x	x	x	x	Local		x
Austria	x	x	x			x	x	x	x	Euro		
Belgium	x	x	x		Paris	x	x	x	x	Euro	b/lux	
Canada	x			x	Paris	x	x	x	x	Local	r	x
Czech Republic	x					x	x	x	x	Local		
Denmark	x	x	x		Paris	x	x	x	x	Local	r	
Finland	x	x	x		Paris	x	x	x	x	Euro	r	
France	x	x	x		Paris	x	x	x	x	Euro	r	
Germany	x	x	x		Paris	x	x	x	x	Euro	r	
Greece	x	x	x		Paris	x	x	x	x	Euro	r	
Hungary	x					x	x	x	x	Local	r	
Iceland	x				Paris	x	x	x	x	Local		
Ireland	x	x	x		Paris	x	x	x	x	Euro	r	
Italy	x	x	x		Paris	x	x	x	x	Euro	r	
Japan	x				Tokyo	x	x	x	x	Local	r	x
Republic of Korea	x				Tokyo	x	x	x	x	Local	r	x
Luxembourg	x	x	x			x	x	x	x	Euro	b/lux	
Mexico	x			x	V del Mar	x	x	x	x	Local		x
Netherlands	x	x	x		Paris	x	x	x	x	Euro	r	
New Zealand	x				Tokyo	x	x	x	x	Local		x
Norway	x	x			Paris	x	x	x	x	Local	r	
Poland	x				Paris	x	x	x	x	Local		
Portugal	x	x	x		Paris	x	x	x	x	Euro	r	
Slovak Republic	x					x	x	x	x	Local	r	
Spain	x	x	x		Paris	x	x	x	x	Euro	r	
Sweden	x	x	x		Paris	x	x	x	x	Euro	r	
Switzerland	x					x	x	x	x	Local		
Turkey	x				Black Sea	x	x	x	x	Local		
United Kingdom	x	x	x		Paris	x	x	x	x	Local	r	
United States	x			x	USCG	x	x	x	x	Local	r	x

Source: Knightsmart

5.12   SUMMARY

On the basis that, as there appears to be a preference for OECD nationals on board OECD owned / managed tonnage, possible options to safeguard their continued presence on board may include the following:

- A collective OECD training programme, structured to incorporate relevant flag state requirements (which may be in excess of STCW requirements).

- An OECD subsidy, to help offset the higher costs than from other non OECD major supply centres – perhaps linked to tonnage tax regimes.

- The introduction of a specialised training programme, to bridge / assist the transfer from sea to shore based employment – thus providing the requirement for ex seafarers in many jobs within a marine shore based office.

- The creation of an OECD-wide Rating to Officer training scheme, thus ensuring all OECD seafarers, as far as possible, have the opportunity to remain at sea – this on the basis that, should costs become an issue, it is likely that OECD Ratings will be the first group to be replaced by a cheaper manning option.

SHORE MARINERS (LONDON LAW FIRM) - LONDON - 31st OCTOBER 2002

COMMENTARY

As part of the research it was agreed that opinions, from former mariners, now working ashore in the shipping industry, would add value to the project.

A special questionnaire was prepared but, in addition, greater input to this area of investigation was forthcoming through the following ways.

⇒ Receipt of a covering letter

⇒ Completion of the PAL questionnaire

⇒ Sharing experiences and views

STYLE

This Case Study is the outcome of the three above forms of communication, with input provided by a former ship master, now a practising lawyer.

THE COMPANY

This is a London based firm of solicitors, large in size (almost 500 employees), including approximately 20 former mariners. The firm has offices in Greece, the Far East and China, all of which require a small number of ex seafarers.

DISCUSSION POINTS

The key factors are:

⇒ There is an ongoing dependency on the marine industry – in effect, ships staff to provide future employees. Even to maintain this status quo (within the firm), there is always a need for new seafarers coming in at the "bottom" end of the firm, as the older members retire and move on out of the "top" end of the firm.

⇒ History has shown that it is easier to teach seafarers to become lawyers rather than the other way round. On average it takes two years for a former seafarer (ideally a Master) to become a lawyer, with a best "coming ashore" age of early 30's. Some jobs, however, have been filled by former naval personnel.

⇒ Finding suitable seafarers in the past was not the problem as it is today, with no signs of the position improving.

⇒ There is at present a dearth of suitably qualified merchant seafarers to enter the law profession. As an example, and quite recently, more than 35 potential candidates (mainly from the UK, but also including a small number from India and Croatia) were interviewed, with no resultant job offers being made.

⇒ In the past it was not uncommon to recruit a promising candidate, even though there was not a need at that time – this "luxury" is not possible today, as demand is always greater than supply.

⇒ Training, when ashore, is provided, including skills / learning needed to achieve a law qualification.

⇒ As regards future needs, it is difficult to predict what the requirements, for this firm, will be. However, and as regards marine issues, there can be no doubt that ISM, Port State Control, precondition surveys, STCW, risk assessment by underwriters, etc are all having a beneficial effect on safety and, as a consequence, the number of casualties that take place. The continued need for increasing numbers of marine experienced lawyers will be paramount to the legal profession.

SUMMARY

There has been a considerable change in recent years in that, in the past, when prominent law firms advertised for marine shore positions, there was a substantial response from suitable mariners wishing to come ashore. Today the reverse seems to apply - ie the potential "quality" recruits are staying at sea (possibly influenced by good conditions, tax advantages and increased home leave) and thus a major gap has emerged in the throughput from ship to shore. This situation is not exclusive to legal Companies – ie, and as referenced elsewhere in this Report, many ship owners / managers are also having difficulty in attracting ex (senior) Officers into shore Superintendents positions.

Possible options for the future include a structured Cadet training path (with focus on law) or 'graduate' lawyers, receiving marine skills. Whilst this latter option did not receive any support in this Case Study, it may be, for the future, that predominantly shore based "functional" training schemes can be developed, appropriate to the specialism of the Company, and supplemented with seagoing practical experience – thus providing, eventually, an alternative to the current shore based requirement for ex-seafarers.

The legal profession, however, is not alone in being unable to recruit / retain marine experienced senior Officers, wishing to take up shore positions.

It is wondered if this situation is common in other OECD countries?

COMMENTARY

The two key members of the consultancy team were invited to spend a day aboard a British flag, British operated Ro-Ro vessel, manned predominantly by Polish seafarers but with one British Master and one Irish Master, the total complement being 17 personnel, plus one, (female) cadet.

The vessel, under Belgian ownership, operates a continuous cross channel voyage pattern of six hours between dedicated ports, with a cargo lifting capability of cars, lorries, truck, trailers etc - accommodation is provided for a number of lorry drivers.

VISIT STYLE

Shore management accompanied the two consultants to the vessel, with an initial meeting taking place with the vessel's (two) Masters. Thereafter, a round table, totally open exchange of views took place, with nine seafarers / shore managers contributing to the discussion, which was kept on track by the consultants.

Prior to the visit, the PAL created seafarers questionnaire had been sent to the vessel and a considerable number of completed forms were handed (to the consultants) for later evaluation.

A visit to the operational areas of the vessel also took place.

MEETING POINTS

A summary of the points which emerged from the discussion, principally from the Polish contingent, but with British / Irish input is:

⇒ The **attractiveness** of a seagoing career is seen as:

- The independence and freedom of the working environment (? job satisfaction).
- Total job interest, whether deck, engine or catering.
- The quality of life which is found on board and, by and large, at home.
- Employment conditions are regarded, relative to other occupations ashore, as good.
- Finally, and perhaps most important, the pride in the vessel, the job and the comradeship which accompanies this pride.
- Responsibility at an early age.
- Increasingly, a truly international industry.

⇒ The **drawback**s of a seagoing career are seen as:

- Little or no security of employment.
- Boredom of life at sea (mainly deep sea) but also in coastal operations.
- The perceived (by others) of the poor image of seagoing – little social standing and limited understanding by peers of what a seagoing career entails.
- Limited social life.
- Being away from the family.
- Opportunities for training are sometimes restricted, due to operational demands.

⇒ Other **relevant points** were stated as:

- There has been a dramatic increase, recently, in jobs / news / opinions / general communication via the internet – not all positive.

- There can be major differences in all aspects, between coastal and deep sea operations.

- It is believed that Officer jobs will continue to be available, for some time, for OECD personnel, but (for economic reasons) not for Ratings.

⇒ Areas for **shore management** attention from seafarers, collectively, were stated to be:

- The importance of selection of future seafarers cannot be overstated.

- The importance of ship / shore relationships is vital, with total dependency on each other.

- Seafarers need to feel valued and recognised by shore management.

- The quality of good (or bad) shore management can have a positive (negative) effect on the operation.

- The employment package, principally the salary / wage element, must not be under estimated, especially if continuity / commitment is to be achieved. This must compensate for the unsocial aspect of seagoing life.

- There needs to be a vision of the future to sell a marine career to young people - this vision must enhance sea and shore opportunities for progression.

- Loyalty (as understood twenty or thirty years ago) has faded but can be / is being replaced by teamwork / pride and the desire to be seen, and recognised, as professionally competent.

- There has been, and continues to be, a major narrowing of nationality gaps, whether this relates to language (English), respect for cultures (increasing), and even employment benefits.

- Continued training is regarded as essential, especially in man management skills.

- Seafarers to have greater involvement in management decisions – eg decentralisation.

SUMMARY

Whilst recognising these are the views of only one vessel complement, they are nevertheless reported in their entirety and give an insight into seafarers views today. Former values, created by permanent and stable employment at sea and shore, have disappeared, but can be replaced by on board pride and the growth of cultural understanding (and the respect this brings) between mixed nationalities.

6.   THE TRAINING REVIEW

6.1   GENERAL

The Training Review covers the application of training in the wider shipping industry. It provides general information on the present provision of training and where the future lies, with regard to:

- the legal and voluntary provisions for seafarer training
- a broad discussion on the training that is available for office personnel
- the results of industrial views on training from owners, builders, employers, seafarers, and
- observations on the future development of seafarer training

Training in shipping is carried out in most countries of the world and 70% of all maritime training organisations are situated in OECD countries. Amongst all the national diversity of thirty countries there is little conformity in the general training of people and, similarly, each country has developed its own specifics for a maritime education system.

6.2   MARITIME EDUCATION

Maritime education can be roughly divided into four main areas, safety, technical, commercial and everything else, although these areas do overlap extensively and must be considered individually:

Safety training relates to the crew, ship security, cargo and environment and is covered by the IMO: STCW, SOLAS and MARPOL Conventions and requirements. Certification for personnel in Watchkeeping Competences, fire-fighting, Oil Tanker Safety and Dangerous Cargoes can be obtained by attending courses and passing assessments. Training is also compulsory onboard the ship through demonstrations, drills and exercises that cover the safety equipment carried, eg life jackets, fire extinguishers etc, and the processes and procedures for emergencies onboard, eg collision, pollution etc. Participation of onboard training must be logged.

Technical training is closely related to safety but not mandatory, apart from broad interpretations of the requirements of the ISM Code, which relate to ship familiarisation and understanding the Safety Management System (SMS). It covers the highly sophisticated equipment – eg IT equipment and software, which is often carried onboard ship and the introduction of new technology or processes to the ship, anything from a new radar being fitted to the introduction of EEBD or a change in a bunkering procedure. Frequently, because of the schedule and operation of the ship, training and instruction in this is left to the installation team to provide a ship's Officer with how to switch it on and operate it and for him or her to train the remainder of the onboard crew.

Commercial training covers the business related activities of the ship and its operation, the procedures and processes for complying with the contractual requirements of the operation, rather than the statutory obligations, eg charterparty/contract law, cargo claims etc. It also covers the commercial and social requirements of crew management eg pay, reliefs and accident claims.

Other areas of training include management training, with all the areas of finance and budgets, personnel or human resources, marketing, public relations, administration, training provision and secretarial skills. Obviously, these functions of the Officer's role are highly demanding, time consuming and in many cases, totally overlooked by owners, operators and training establishments.

6.3   PROVISION OF TRAINING

As seen already, there is a wide diversity of training subject areas expected to be provided to seafarers, but there is, also, a wide diversity in the methods of training, routes and media for delivering the education and training identified.

The main channels for delivering training are through colleges, company in-house programs, professional institute seminars and training consultants. However it is provided, all training stems from the basic needs of providing relevant and up-to-date information, unfortunately this often overlooked, with many training providers delivering what they think is necessary rather than what is relevant. Frequently, passing on useful, practical information comes second to passing academic examinations.

6.3.1   Safety Training

The major influence on the safe operation of the ship is the International Maritime Organization (IMO), the UN body that regulates the safety aspects of ships and shipping, including people, operations, cargo and the environment. The prime authority on training is the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) 1995 that came into full force on 1st February 2002.

The legislation lays down the fundamental training requirements for all people at sea who can affect the safety of the ship, its crew and the environment. Each role onboard is classified as:

- "Management level" - the level of responsibility associated with serving as master, chief mate, chief engineer Officer or second engineer Officer on board a seagoing ship, to ensure that all functions within the designated area of responsibility are properly performed;

- "Operational level" - the level of responsibility associated with serving as Officer in charge of a navigational or engineering watch or as designated duty engineer for periodically unmanned machinery spaces or as radio operator on board a seagoing ship, to maintain direct control over the performance of all functions within the designated area of responsibility in accordance with proper procedures and under the direction of an individual serving in the management level for that area of responsibility;

- "Support level" - the level of responsibility associated with performing assigned tasks, duties or responsibilities on board a seagoing ship under the direction of an individual serving in the operational or management level.

The vast majority of safety training is carried out through either established maritime colleges or specialist training organisations that have either government or industrial approval. Within this area a high degree of conformity on an international basis, eg through STCW, occurs. The way the STCW Code is interpreted, it is the responsibility of the certificate issuing country to set the syllabus, the importance they put on the syllabus and the underlying principles of knowledge needed to support the competencies, and different countries put different emphasis on different subjects.

In addition, some countries have competency examinations that are enveloped in an academic qualification. The advantage of this is passing one examination gives a standard that is recognised by any shorebased employee as well as providing the seafarer with the certificate that will allow them to work on a ship. The disadvantage is that many seafarers feel the bias towards the academic study is too great.

Additional safety training is required to be carried out on the ships, although the significance of some of the "training" carried out is questionable, running through a catalogue of drill scenarios by the same group of senior personnel often looks like satisfying the records rather than contributing to the safety of all concerned. This is attitude is mirrored by the number of SOLAS related detentions recorded by various Port State Control organisations.

Voluntary training for crews regarding safety appears to be carried out by a minority of owners and operators.

6.3.2   Technical Training

The ships being built today and in the future carry complex and technically demanding equipment and systems. They also carry more manual and automatic equipment, systems, procedures and processes, than ever before. The international rules and regulations that need to be understood and complied with

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are also being increased regularly. Presently there is a need for Officers and crew to have a higher degree of different and diverse competences than those expected in the past.

The equipment and systems carried onboard include the "hardware" of computers, complex anti-pollution monitoring equipment and complex machinery, the "paperware" of quality and safety management systems and the "software" of programs that provide charts, maintenance and engine room monitoring. and finally, of course, the ship has the delicate and complex "humanware" of crews that can be drawn from every possible culture, creed and nationality.

Yet there seems to be little, if any, provision for structured information or training in most of these areas. It is often purely luck rather than judgement that finds a seafarer provided with training in any of the advanced equipment or systems that are fitted on the ship. Frequently the use or maintenance of the intricate and complex equipment is left to chance or the ability and inclination of the seafarer to read a manual.

One area of ship design and technology that continues apace is IT (see Technical Review). Computers get more complex and programs get more encompassing, yet the average seafarer is left in the dark. A competent amateur will soon get a reputation as a "computer wiz" purely on the merit of keeping their own machine operating and knowing how to do a spreadsheet. Computer training is almost non-existent in offices and at sea, yet Officers, especially senior Officers, spend a large proportion of the daily routine typing data into the terminal that will link the ship to the "shipmanagement" server". "One point of entry" is the catchword for any computerised management system, and the "one point" is normally the ship logging ROB (oil remaining on board), day's run, maintenance carried out, money spent and all the other items that make up the operational finances of ship management. Yet, normally, the person entering the data is one of the highest paid members of the crew and the least trained in typing skills.

6.3.3   Commercial Training

There are no internationally recognised standards of marine commercial training or qualifications. Many organisations run training seminars and workshops in a multitude of subjects from ISM Code to safe handling of cargo, however, most are not to a recognised standard. In addition there are recognised bodies such as the Nautical Institute and the Institute of Chartered Shipbrokers that have well-developed distance learning programs and college courses, syllabus and qualifications, which are recognised in the international shipping industry. They also have branches and examinations centres in many parts of the world.

On rare occasions, a company might recognise the dearth of commercial acumen amongst its employees and decided, voluntarily, to do something about it by providing in-house training and run courses on Commercial Aspects of Shipping, bills of lading or other commercial areas where vast amounts of money can be lost due to the lack of knowledge of an Officer, deck or engine.

6.3.4   Other

As previously mentioned, this sector of training covers everything else. It can be covered generically by management studies and will allow good junior Officers to become better seniors. By identifying the subjects outside the mainstream shipping syllabus, it will prepare seagoing personnel for the radical change experience when working in the office, by introducing subjects such as budgetary control, resource management and other black arts..

In addition, this area covers what to say in a contingency, how is the master or chief engineer to react if a mass of microphones are thrust at them as a consequence of an incident. Do people learn marketing and public relation skills naturally? Finally, crews are expected to interface with any number of cultures with whom they have no similarities in food, ethics or language and the only common factor is they all work on the same ship. In amongst this polyglot crew, the senior Officers of the ship are expected to provide help and instruction, and keep the job going. Culture today plays a vital part in the safety of the ship, but how many senior people know how to deal with it?

But for the mainstream sea going or office employee in the shipping industry, wanting to develop their social or management skills, the post-Certificate of Competency training is normally based on a university degree or diploma.

6.3.5   Training Options

Structured Course

The structured system of nautical training has always provided the most common method of training for seafarers. With classes, a very strict syllabus and, normally, much "homework" of previous examinations the student often see it as a "crammer course" to get through the statutory examinations and thus resume their career at sea. It is a difficult way of providing education and development to participants. There are few, if any, other careers where a person is still required to sit an examination and, on passing, wait for a period of time before sitting the next part which often goes over many aspects of the previous course, STCW 95 provisions, eg

"Every candidate for certification (of master and chief mate) shall: 1. meet the requirements for certification as an Officer in charge of a navigational watch on ships of 500 gross tonnage or more and have approved seagoing service in that capacity…..1.1. not less than 12 months" STCW Regulation II/2 Motivation and continuity in these conditions are very hard to maintain and it is difficult to resume studies once a person is out of a learning mode. In addition, the age of the student becomes progressively higher and the commitments, such as a growing family, often have a detrimental effect on the their progress.
It has benefits of seafarers meeting peers from other companies, ship types and trades that allows a wider knowledge of shipping to be fostered, but in many cases, especially where the student is self financed or on reduced salary, the seafarers main aim is to pass the examination and get back to earning money as soon as possible.

Obviously the structured course has a major role to play in nautical education, especially at the beginning of a seafarer's career. Setting and providing knowledge at academic levels through diploma, degree or equivalent standards is a paramount but the industry must not lose sight of the alternatives.

Short course, Seminar and Workshops

Many regulatory qualifications can only be obtained through attendance at a short course, eg Oil Tanker Safety, these 2 – 5 day course provide specific information and knowledge in the most economical period. Often residential, that allows discussion to proceed after class hours, and of smaller size, that allows everyone to participate, the courses can be run easily in most locations.

Seminars and Workshops tend to be more generic, covering specific issues from a broader viewpoint, eg Charterparty Seminar or Tanker Operations Workshop that are designed for all areas of the industry from lawyers and non-seafaring office staff looking for knowledge to Officers looking for a broader grasp of their industry.

Short course, seminars and workshops are also provided by in-house or consultant trainers for individual companies on subjects identified by them as having a need for instruction. The range of subjects can be anything from a company office induction course or office contingency workshop that identifies each person's role in an emergency to a specific seminar on a recent commercial claim against the company and how to avoid future reoccurrences.

Distance Learning

Many of the post certificate of competence and institute tuition is carried out through distance learning. The commitment of a student to this type of has to be of the highest order. A genuine commitment to set regular hours of study aside, complete assigned tasks, read suggested texts and communicate with the tutor, made easier these days with e-mail and web sites, are paramount. Without commitment the student does not complete the course at a financial loss to himself / herself and a sense of failure with the course provider. Often distance learning is intermingled with short sharp burst of seminar work at a convenient location.

Computer Based Training (CBT)

As an alternative to distance learning many organisations are turning to CBT to provide a discrete individual training tool. In a situation where a mass audience of more than one are impossible CBT

comes into its own by allowing each person, eg on a ship, to run through the training course at their own speed and at times that suit them. The individual's efforts and results are computer scored, identified and recorded. The student knows how they are doing and can be made to redo certain items that were below par. The final results are transmitted to the master and office's training function for appraisal. Subjects for this type of training cover a wide area and there are many professional companies that can produce bespoke / tailor made courses.

Mentoring

Possibly one of the most effective ways of transferring practical knowledge and skills, especially for seafarers, is to provide a one-to-one instructor that the student can call upon for assistance and help. Whether it is splicing a wire, taking a sight, or stripping a piece of machinery, the learner will get a far better and safer feel for the process if they see somebody do it well and then carries it out themself. Practical skills can only be perfected by practice.

The obvious problems with mentoring are; a) do the mentors have the requisite skills and b) can they impart the information, ie can they teach?

6.3.6   Train the Trainer

Assessing and training the trainer is an area that is often overlooked in all industries, no more so than the shipping industry. Onboard ships, the phrase of "do what I say not what I do" was often heard, and probably still is, and highlights a major problem with all training. The only way to ensure true commitment in a skill is to work with and be trained by the best. Unfortunately, it is probably accurate to say that Master, Chief Engineers and other senior Officers do not always make the best trainers. Nobody can deny their competences in knowledge and skill, but often their man management abilities have not been developed fully and it is rare for them to have trained in the role of trainer.

6.4   INDUSTRY VIEWS ON TRAINING

6.4.1   Ship management

In an employment world with no constraints most ship operators stated they would use OECD senior and junior Officers to serve onboard their ships and one of the reasons cited for this opinion was, the Officers' training, quality and competence. However in a further answer about ensuring a positive future for OECD Officers, 50% of respondents said there should be an increase in Officers' management skills and a third identified the need for an increase in training and onboard skills, albeit a similar percentage wanted shorter and more economical initial training.

When asked about a need for extra skills, three quarters of respondents felt that these were needed for Officers with the management scoring the highest (56%) followed by IT (44%). About a quarter of respondents identified engineering, specialist navigation equipment and cargo handling as areas of extra need.

When companies were asked about their shore based staff, 78% identified former company seafarers as being a major recruitment area and 59% employed seafarers from other companies. When the total ex-seafarer employment in offices were averaged out, about 50% of all shorebased fleet management operations were ex-seafarers. 65% of companies also saw management practices increasing the number of staff required over the next 5 to 10 years.

6.4.2   Owners

For onboard personnel, owners felt the traditional areas of training were well covered by marine training establishments, however for modern technologies, eg up to date software and computer equipment, IT and computer monitoring, the percentages were reversed and only about a third thought that training in these areas was sufficient. Comments included a view that technology was outstripping practice and training establishments were not always producing "hands on" engineers.

From the responses to the questionnaire, an owner who purchases either a new ship or equipment provides training to both ship and shore employees, two thirds of seafarers, senior managers and

shorebased superintendents receive some form of training or instruction. When asked about marine training establishment personnel only a quarter said the provided something, and then mainly media.

With regard to employment ashore, owners look upon ex-seafarers as an asset and over half their employees have been to sea. Though they do recognise a need to improve their interpersonal skills and financial awareness.

6.4.3   Shipowner Organisations

On the whole, shipowner organisations think that marine training establishments provide sufficient specific technical training in all areas except the more modern aspects of IT, software and computer equipment used onboard.

It is important that, though one of the main reasons identified by shipowner organisations for choosing OECD Officers is their commercial and management skills, the majority also say that seafarers need extra skills and one of these concerns management.

6.4.4   Ship Builders and Equipment Manufacturers

Marine training establishments were not looked upon favourably with regard to providing specific training, all respondents registered negative responses.

Information from ship builders and equipment manufacturers are a valuable resource in ensuring that seafarers and office personnel are kept up to date with developments within the industry. Yet only 25% of respondents provided any training and instruction to marine training establishment personnel, against two thirds providing it to seafarers on ships using the equipment and senior managers. Noteworthy is the fact that only 40% of respondents provided shorebased maintenance staff and superintendents with the instruction.

6.4.5   Marine Shore Groups

This group, which covers shipping industry authorities and organisations, including government bodies, all presently take ex-seafarers to fill about one fifth of their staff numbers and they employ them for their practical, technical and personnel shipboard experiences. The vast majority do recognise, however, that they must provide additional training in office and management skills to obtain the best from them. As one respondent stated, it is easier to teach a seafarer legal skills, than a solicitor marine skills.

Most shore groups find that where pure maritime knowledge is concerned, the marine training establishments provide sufficient specific training, but in areas concerning operational practices of budgets, legal and commercial activities, and personal and management skills, there is a noticeable short fall.

A majority view was that current marine training does not provide sufficient specific training for seafarers coming ashore to work. Former seafarers that do get shorebased employment lack the necessary skills for the new environment and training in these new skills is provided by most individual organisations.

6.4.6   Seafarers

Training for sea-going Officers appears to be less than adequate and many feel that extra skills are required in areas such as IT and management. Over the next 5 to 10 years, the majority also foresee training increases in management practices, onboard technology and ship design. A sizeable minority also feel that training in operation practice will increase.

The overwhelming majority of seafarers who provided replies felt that their training and experience had prepared them for careers ashore in the shipping industry. Though when asked what extra training would have been of benefit the majority provided comments on business administration, personnel management and other areas of general management and stated that modern training systems should prepare people better for future moves into shore jobs.

6.4.7   Marine Training Establishments

The majority of marine training establishments felt that marine training and working experience did not provide sufficient specific preparation for seafarers wishing to take up shore employment within the industry. All areas of Operational practices - budgets, legal, etc, Management strategy - QA / ISM Code, marketing, finances, etc, Office technology - IT, communications, etc, Personnel skills - handling staff, client relationships, etc and management skills were seen by half the respondents as being in need of further training.

Despite the view that there was a deficiency in training, only 40% of the colleges or organisations that replied presently provide seafarers with training specifically designed to prepare for working in shore-based positions. Some of the training that was provided was via degree study.

In addition 70% of college and training organisations did not provide shorebased personnel with training in marine skills required for working in the general shipping industry. Yet 70% of the organisations were of the opinion that this type of training would increase over the next 5 to 10 years.

The minority of responding marine training establishments felt that shipbuilders and equipment manufacturers provided them with sufficient specific information in the knowledge, care and maintenance of the technical and IT equipment. It is indicative that 20% said they provided information on request; one has to wonder if the other 80% did not actually request information!

6.5   VIEWS ON TRAINING MEDIA

With today's modern technology almost all training and instructional material is being provided in hard (paper) copy, and training organisations use less modern technical media than both owners and builders/ manufacturers.

Yet the seafarers who replied felt that information was best delivered in video format, while CD-ROM, which includes CBT and Multimedia, were next and hard copy was last. Other forms of presentation were simulators, e-mail and the web (internet).

All information on equipment/design provided by builders/manufacturers in the form of operating manuals, maintenance manuals and training manuals, as well as information manuals/brochures was in English.

6.6   TRAINING FOR THE FUTURE

A study by Asia Pacific Economic Cooperation (APEC) in 1999 identified that amongst its members (and a quarter of the OECD countries are members), education is the single most important factor in improving safety standards in the region.

It also identified that "inadequate technical training for maritime safety authorities" was a major cause for concern when many maritime safety administrations lack the technical expertise to effectively implement regulations. Many do not have suitably trained and experienced personnel to correctly interpret the regulations, translate them into operational terms, and apply them as intended and many of these people also have limited or no practical knowledge of commercial shipping.

"Lack of management training for the industry" was also an area highlighted for concern, where it was seen that there is, for instance, a general lack of awareness of, and adequate appreciation for, management's pivotal role in the development and implementation of quality, safety, and environmental management systems. When the ISM Code was brought in, with its radically new concept, many managers in the maritime industry were largely unprepared to meet the challenge.

The final area of concern was the "poor quality of seafarer training" where, in general, seafarer training is criticised as not rigorous or practical enough. When seafarers come on board, they are often found to be generally unprepared to carry out safe ship operations. Some do not have the level of competence required; others do not even know what is required. Many shipowners, marine pilots, terminal operators,

and classification societies believe that the competence of seafarers remains well below the required standard and that nationality is unrelated to standards of competence. (Safer Shipping in the Asia Pacific Region Project by Dr Jeffrey Hawkins: Asia Pacific Maritime Institute)

Though these remarks were directed at the Pacific Rim countries they can be seen, through this Report's questionnaire, to hold as equal in the rest of the world. Maritime training is developing tunnel vision and the reliance on "safety training" has become an over riding factor. Reaction to events has always been a prime cause of national and international legislation in all areas of shipping, whether it is passenger ship crowd control, "security" or pollution, extra training has been seen as the answer. As the report identified "another problem is continually increasing training. Mariners need to prove sea time, take a physical and spend money to upgrade qualifications, which makes it much harder than it used to be to keep your job and very much harder if a person wants to improve their situation and upgrade."

Each country, economic area, industry advisory board and interest group has its own individual views on the need for training, who it should cover, how it should be carried out and who should finance it. Many of these views are often developed into local initiatives without looking at what the wider world has compiled and completed previously. Some provide a model that should be developed and implemented within the wider industry. In many cases, unfortunately, the initiatives do not get broadcast to the wider industry and remain neither implemented nor discussed. Examples for consideration include:

⇒ France's nautical college's opening up their schools to foreign students. They are planning to adopt their training to meet present and future demand of domestic and international companies and are cooperating with colleges in other European and North African countries.

⇒ Australia's maritime college, which had been hit by falling Australian student numbers, extended its training to overseas students. But these numbers have declined due to tight national immigration requirements. However national intake has subsequently risen. It also has innovative ideas at aimed technical and vocational college leavers that allows them to both train for sea-going or link it to a seafarer's degree course that requires no sea-time requirements.

⇒ A UK college is developing the potential of distance learning to give flexibility in training and to meet the needs of the evolving training needs of its clients.

⇒ Japan's National Institute for Sea Training is having a 6,000 GT training ship for delivery in mid-2004

⇒ The EU's Maritime Industries Forum see "Career mapping" to identify the industry's shortages, training needs and costs, and help to focus on barriers to mobility between marine sector and its sub-sectors as an answer to reversing the decline in the EU maritime skill base.

⇒ The UK's Marine Foresight panel which was looking into the future of the maritime industry, in particular the engineering and technical skills, identified skill shortages as likely to become a growing limitation to marine business.

⇒ Germany has implemented a training-scheme that can be financed through government support for onboard training of additional EU crewmembers.

⇒ US and Canada recently (May 2002) set up working groups to look at six areas of maritime concern and, among the areas discussed, they established consensus on what actions are needed to enhance recruitment and career paths, identified that potential labour sources and stakeholders were best able to facilitate this process and committed themselves to establishing clearly defined career tracks within the maritime industry. This included the observation that the industry has no central contact point where potential mariners can determine how to enter the industry or obtain career path information. (Maritime Careers: Implementing The Action Plans for Recruiting and Retaining American Mariners.)

One of the most influential documents identified in the course of the Report is Canada's Western Transportation Advisory Council (WESTAC) Skills Shortages in Transportation Workshop, where training problems were identified as:

⇒   Lack of cohesive leadership and vision in transportation for human resource policy and practices
⇒   Training/education institutions attempt to be industry-responsive but they do not always succeed
⇒   Lack of knowledge about transportation training/education availability

With such comprehensive and easily identifiable conclusions, it is to be hoped their recommendations do not go the way of much other fine work.

6.7   OBSERVATIONS

From all evidence identified during the research process and the questionnaires received for this Report it is clear that the shipping industry has an abundance of legislation and industrial practices that concentrate on one main area of shipping, safety. The requirement for all qualifications related to IMO/STCW to have a high content on safety is perfectly understandable, but to the exclusion of most of the other aspects of shipping, eg technical, commercial, personnel and management, does not make for a balanced professional seafarer.

Much of the safety training is seen as rooted in the past, with many traditional aspects of nautical knowledge, that are examined on a continuous basis throughout a seafarer's educational career and make up a small part of the seafarer's daily work, taking precedent over the more contemporary areas that the seafarer uses continuously throughout the work day. In many cases, people perceive this imbalance to be evidence that the training seafarers receive is inappropriate to the present, let alone for future developments.

Where basic skills are required, senior Officers and shore based employers suggest that training establishments have put too much emphasis on the academic and theoretical knowledge rather than the practical, a comment by one Chief Engineer reported that he felt some newcomers "would find it difficult to decide which end of a hammer to hold".

Despite the innumerable workshops, forums, seminars and conferences on training and its relevance that seem to have proliferated in recent years, it appears that the most important points raised appear to identify that there is a lack of cooperation between the trainers and themselves, the employers, the builders and equipment manufacturers and even the seafarers. Communication would appear to have broken down and STCW and its related subjects have become the driving force for most of the training provided, whether it is certificate courses, short courses or the, rare, company in-house course or video presentation.

Technology has outgrown the purely training in traditional subjects, new equipment and technologies abound onboard ships and in their management and operations. Most is learnt in ad hoc and, unsafe ways, with no control or assessment. It seems the courts agree – eg in the "Eurasian Dream" case, which concerned a car carrier which caught fire in 1998, the judge felt that directing the Master, by a standard briefing letter, to read a vast amount of documentation, including "manuals which ran into hundreds of pages and about 100 technical manuals" (a task that would have "occupied two to three weeks of the Master's time while on board the vessel"), was an inadequate means of instruction.

It is evident from all categories of respondents to the Report questionnaires that seafarers will continue to be employed in shore-based positions. In certain areas the actual numbers are seen to possibly increase, but in all areas, organisations do not see a decrease or down turn in the numbers that will be required. Shore based employers feel, in general, that seafarer's education does not prepare them for employment ashore, and ironically the employers included training establishments where 60% of respondents thought that marine training and working experience did not provide sufficient specific preparation for shore employment, and yet whose ex-seafaring personnel make up three quarters of the teaching staff.

If the industry is to provide a career structure that suits seagoing personnel and shore-based employers, there must be a far more co-ordinated approach in the training the required subjects. People leaving sea-going positions will require additional training to achieve the higher level of skills that can be found in most other disciplines and that they will be expected to have if they wish to rise in seniority in a company ashore.

But it is reassuring to know that marine training establishments are aware of the possible future changes over the next 5 to 10 years and anticipate themselves being ready for the new training needs.

6.8   CONCLUSIONS

International seafarer training should be reviewed with the intention of making it more responsive to the ship's actual needs regarding technical, commercial, personnel and management aspects of the ship's operation.

Additional co-operation must be encouraged between marine training establishments, seafarers and industry employers, including ship and equipment builders, to ensure that relevant training is provided for ship's operation and shore employment and relevant, and up-to-date information, is provided to students.

Technology used in ships today must be taught and every effort should be taken to ensure that the syllabi of qualifications and examinations are upgraded at frequent intervals and not carved in stone for perpetuity.

With so many organisations and work groups from Greenwich to Winnipeg working on reports and surveys, and identifying realistic steps that must be taken to ensure the survival of the professional seafarer and the work that is done by them on ships and in shore employment, it is essential that a depository of all comments and recommendations can be found and communicated to ensure that something is done about them.   The OECD can possibly take a lead in this direction.

7. APPENDICES

This section includes:

⇒   Questionnaire Analysis - Narrative

⇒   Questionnaire 1 - Analysis

⇒   Questionnaire 2 - Analysis

⇒   Questionnaire 3 - Analysis

⇒   Questionnaire 4 - Analysis

⇒   Questionnaire 5 - Analysis

⇒   Questionnaire 6 - Analysis

⇒   Questionnaire 7 - Analysis

⇒   Blank Questionnaire 1 - As an example

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QUESTIONNAIRE ANALYSIS - NARRATIVE

With a view to achieving maximum input to the project, a series of specially created questionnaires were despatched to shipping interest groups. Numbering seven, each has been individually analysed, with the outcomes being included in the final part of the report.

The response from each questionnaire now follows and, as part of the data collection process, those parties who contributed to this questionnaire process will receive a copy - all are anonymous.

Questionnaire 1 - Ship Owning / Ship Managing Companies

This questionnaire was the prime questionnaire and was directed at some 250 ship owners / ship managers, as these are the key groups associated with the deployment of OECD seafarers. An encouraging 18% response was received, covering 18 countries, and this has assisted in making this research most meaningful, embracing from the very large ship manager to the small family concern.

Questionnaire 2 - Owners

This questionnaire, sent to a smaller number of ship owners and ship managers, was directed at the Technical discipline, with the aim of eliciting specific engineering, ship design and ship building information. A response rate of 16% has been achieved, covering 17 different OECD countries.

Questionnaire 3 - Ship Builders / Equipment Manufacturers

This questionnaire was sent to a random selection of OECD ship builders and equipment manufacturers. A return rate of 14% was received, covering six OECD countries.

Questionnaire 4 - Training and Development

This is referred to as the College questionnaire and was based on the first analysis of information from questionnaires 1 and 2. A total of 30 questionnaires were despatched with 33% of replies being received.

Questionnaire 5 - Seafarers

With the co-operation of shipping Companies and unions, replies to this seafarer questionnaire have been received from a range of ranks (Officers and Ratings). Nationality responses included Danish, Swedish, Irish, Italian, Polish and British, covering both Officers and Ratings.

Questionnaire 6 - Ship Owners Organisations

A 33% return was received from this questionnaire, which was the last one to be despatched and which had a target audience of ship owners organisations.

Questionnaire 7 - Marine Shore Groups

This questionnaire was sent to 33 OECD based Companies and organisations that provide a service to the shipping industry and employ ex seafarers, eg flag state organisations, international organisations, pilotage authorities, insurance, Port Companies and consultants. A response of 24% was achieved, covering four OECD countries.

SHIP OWNING / SHIP MANAGEMENT COMPANIES

Question 1 : How many ships do you operate?

Total ships covered by survey = 1376
Average per Company   =   33

Tankers   = 32%
Passenger / Cruise / Ferries   = 4%
Dry cargo / Bulkers / Reefers = 52%
Specialist - Cable Layers / etc = 3%
Others   = 9%

Question 2 : How may seafarers, in total, of all nationalities does your company employ / manage?

Total seafarers covered by survey   = 29,702
Average per Company   =   724

Average Senior Officers per Company =   154
Average Junior Officers per Company   =   157
Average Ratings per Company   =   413

Question 3 : How many OECD seafarers does your company employ / manage?

Total OECD seafarers covered by survey   = 10,614
Average per Company   =   259

Average OECD Senior Officers per Company =   87
Average OECD Junior Officers per Company   =   67
Average OECD Ratings per Company   =   105

But some OECD Companies do not employ any OECD seafarers, and

10% do not employ OECD Senior Officers
17% do not employ OECD Junior Officers
24% do not employ OECD Ratings

Question 4 : What are the main reasons your Company employs / manages OECD seafarers?

Officers		Ratings	
Owners choice	= 76%	Owners choice	= 62%
Commercial / Management skills	= 65%	English speaking	= 46%
Skill / Specialisation for ship type	= 62%	Trading area	= 46%
English speaking	= 54%	Skills / Specialisation for ship type	= 46%
Trading area	= 35%	Availability	= 38%
Flag requirement	= 32%	Flag requirement	= 23%
Availability	= 24%	Cost	= 19%
Union pressure	= 11%	Union pressure	= 19%
Cost	= 5%	Commercial / Management skills	= 12%

Question 5 : Do you predict, in the present circumstances, that the number of OECD seafarers employed / managed by your Company, over the next 5 - 10 years, will increase or decrease and by what %?

OECD Senior Officers	Increase	= 25%
	Decrease	= 29%
	Stay the same	= 46%
	Average change	= Decrease of 3% per Company
OECD Junior Officers	Increase	= 27%
	Decrease	= 34%
	Stay the same	= 39%
	Average change	= Decrease of 5% per Company
OECD Ratings	Increase	= 17%
	Decrease	= 37%
	Stay the same	= 46%
	Average change	= Decrease of 15% per Company

The main reasons given include:

- Cost reasons - OECD seafarers too expensive
- Lack of availability of OECD seafarers
- Some increases due to Company expansion

Question 6 : In an employment market with no constraints whatsoever, which nationality of seafarer would you choose for your fleet?

Senior Officers	OECD	= 93% in first place
	Central / East Europe	= 2% in first place
	Indian Sub-continent / Far East	= 5% in first place
Junior Officers	OECD	= 80% in first place
	Central / East Europe	= 5% in first place
	Indian Sub-continent / Far East	= 12% in first place
Ratings	OECD	= 44% in first place
	Central / East Europe	= 15% in first place
	Indian Sub-continent / Far East	= 46% in first place

Note: In some cases, no preferences were given, in other cases, more than one nationality was marked as equal first choice.

Reasons for choices include:

- OECD Officer training and quality
- OECD Officer competence
- Eastern Europeans excellent
- OECD Officer awareness
- Ratings from far east energetic and hardworking

Question 7 : **To ensure a positive future for OECD seafarers what, in your opinion, must be done to ensure that they are employable?**

Officers
Lower total cost of employment	= 76%
Increased number of seafarers	= 67%
Increased motivation	= 60%
Increased government subsidies for training	= 57%
Increased management skills	= 50%
Increased training / onboard skills	= 36%
Shorter / more economical initial training	= 29%

Ratings
Lower total cost of employment	= 71%
Increased motivation	= 63%
Increased number of seafarers	= 67%
Increased government subsidies for training	= 57%
Increased training / onboard skills	= 36%
Shorter / more economical initial training	= 29%
Increased management skills	= 50%

Question 8 : **Is your Company currently training OECD, new entrant, seafarers?**

Officers	Yes	= 73%
	No	= 27%
Ratings	Yes	= 24%
	No	= 76%

Main reasons:

Officers	To provide future seagoing personnel	=	93%
	To provide future company shore staff	=	53%
	Trading areas	=	30%
	For tonnage tax reasons	=	17%
	Other	=	17%
Ratings	To provide future seagoing personnel	=	100%
	Trading areas	=	36%
	Other	=	27%
	To provide future company shore staff	=	18%
	For tonnage tax reasons	=	0%

Question 9 : **In your opinion, and using the same categories of OECD, Central / East Europe and Far East / India, please indicate which group of <u>Officers</u> you think should ideally serve in the following ship types.**

Senior Officers	OECD	Central / East Europe	Far East / India
Specialist tankers - gas / chemical	100%		
Standard tankers	90%	6%	4%
Passenger / Cruise ships	92%		8%
Ferries	98%	2%	
Ro-Ros	88%	8%	4%
Container ships	78%	7%	15%
Dry cargo / bulkers / reefers	58%	18%	24%
Supply / Support vessels	82%	4%	14%
Specialist - Cable layers / etc	96%		4%

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Junior Officers	OECD	Central / East Europe	Far East / India
Specialist tankers - gas / chemical	70%	16%	14%
Standard tankers	57%	15%	28%
Passenger / Cruise ships	43%	7%	50%
Ferries	50%	28%	22%
Ro-Ros	36%	20%	44%
Container ships	38%	7%	55%
Dry cargo / bulkers / reefers	23%	23%	54%
Supply / Support vessels	52%	17%	31%
Specialist - Cable layers / etc	60%	12%	28%

Question 10 : Do your current OECD seafarers need extra skills to serve onboard ?

Officers   Yes = 74%
              No   = 26%

Ratings   Yes = 48%
              No   = 52%

Main reasons:

Officers   Management = 56%
              IT = 44%
              Engineering = 28%
              Specialised navigation equipment = 26%
              Cargo handling = 23%

Ratings   Management = 29%
              Cargo handling = 29%
              Engineering = 29%
              IT = 14%
              Specialised navigation equipment = 5%

Question 11 : In your opinion, will manning numbers of ships over the next 5-10 years be affected by changes in the following

Operational practices - ship size, cargo facilities, etc
Increase   = 16%
Decrease   = 27%
Stay the same = 57%

Management practices - QA/ISM Code, centralisation/decentralisation of responsibility, etc

Increase   = 59%
Decrease   = 0%
Stay the same = 43%

Onboard technology - IT, communications, etc
Increase   = 27%
Decrease   = 24%
Stay the same = 49%

Ship design - automation, maintenance, equipment, etc
Increase   = 14%
Decrease   = 49%
Stay the same = 38%

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Question 12 : **In respect of your shore based fleet management operation, from where do you recruit staff?**

OECD staff	Former Company seafarers	= 78%
	Former non Company seafarers	= 59%
	University graduates	= 44%
	Ex naval (military) personnel	= 15%
	Other	= 12%
Non OECD staff	Former Company seafarers	= 21%
	Former non Company seafarers	= 10%
	University graduates	= 2%
	Ex naval (military) personnel	= 0%
	Other	= 0%

Question 13 : **In respect of your shore based fleet management operation, approximately what % of employees are?**

Former seafarers = Average 50%
OECD former seafarers = Average 47%

Question 14 : **Do you believe this figure will increase or decrease over the next 5 - 10 years?**

Former seafarers	Increase	= 15%
	Decrease	= 30%
	Stay the same	= 55%
OECD former seafarers	Increase	= 35%
	Decrease	= 0%
	Stay the same	= 65%

Question 15 : **In your opinion, does the shore based management of ships today ideally require ex seafaring personnel?**

Quality & Safety	Yes	= 86%
	No	= 14%
Fleet Management - Operations / Technical	Yes	= 98%
	No	= 2%
Fleet Personnel	Yes	= 62%
	No	= 36%

Question 16 : **In your opinion, will the number of shore based staff involved in the management of ships over the next 5-10 years be affected by changes in the following?**

Operational practices - crew size, ship size, cargo facilities, etc
Increase = 27%
Decrease = 13%
Stay the same = 60%

Management practices - QA / ISM Code, office location, centralisation, etc
Increase = 65%
Decrease = 5%
Stay the same = 30%

Office technology - IT, communications, etc
Increase = 38%

Decrease   = 20%
Stay the same = 42%

Ship design / technology - automation, maintenance, IT, communications, etc
Increase   = 35%
Decrease   = 10%
Stay the same = 55%

Comments from Respondents:

⇒ OECD Officers are more competitive and attractive to owners on offshore contracts.

⇒ Shipboard experience of OECD office staff is important for successful ship management.

⇒ Without constraints of availability and costs, I would have no nationality preferences.

⇒ It is evident that:

- OECD governments care only about coastal trade requirements.

- OECD ship owners desperately need to operate at competitive costs.

- The previous motivators for a seafaring career in OECD are lost.

⇒ Due to commercial pressures, there will a tendency to look at East European junior Officers and Ratings to reduce overall operating costs.

⇒ There are now seafarers as good (as OECD) who are available, or being trained from other countries at cheaper cost.

⇒ It is regrettable that, in combination with a lack of seafarers, most ship management and ship owning companies are driven by and controlled by accountants. As such, the prime focus is on the bottom line, rather than quality. Not enough focus is placed on the long term investment, either in the vessel, its equipment and, most importantly, the personnel, ashore and on board – unless this trend is addressed and reversed, the human consequence is potentially disastrous.

⇒ The number of office staff available for OECD countries is decreasing, as are the incentives for those who are left in the industry. Lack of sufficient recompense, combines with deep concerns over the rends in the industry. Are causing many highly qualified and practical ship managers to seek alternative careers, such as surveyors or consultants.

⇒ Few young people are, today, seeking marine education.

⇒ Several of the OECD members are EU members, where there is every likelihood there is "uniform" salary / terms and conditions will be introduced in the future, thereby making these particular countries less attractive / competitive to employers.

⇒ We are trying to push more responsibility back to the vessel, however this requires more training / education.

⇒ Polish Officers offer good value / education and will replace part of the traditional seafaring Ratings and Officers from other OECD countries – eg Norway and UK.

⇒ More berths are needed to be provided for Cadets, to ensure an ongoing supply of junior Officers. If we continue to produce too few OECD Officers, there will be a future lack of those coming ashore into management.

⇒ Cost of OECD is too high, particularly Ratings, who are not "value for money" or availability of some Officers.

⇒ The days of the OECD seafarer are numbered – too expensive – lack of motivation – abilities matched by other nationalities – trade union activities look like increasing.

⇒ Extreme difficulty finding quality shore management amongst our own and anybody else's Officers.

⇒ New technology / tonnage will require fewer Ratings.

⇒ There is a need for competent Officers, acquainted with European standards. High cost of Officers to be compensated by cheaper third world labour supply countries.

⇒ OECD governments should take necessary measures to ensure that a minimal level of the trade should be covered by OECD personnel.

⇒ Competence is at a very high level – it should stay there.

⇒ Company balances OECD Officers with Indian and Filipino Officers – no intention to change that balance in percentage terms.

⇒ New technology on the ships is allowing a slight reduction in manning numbers.

⇒ Preference for (OECD) Officers is based on technical experience and motivation to work hard and cultural reasons.

⇒ We want to retain senior British Officers, but we must cut the overall cost of seafarers.

⇒ The last fifteen years we have maintained a steady supply of OECD personnel and plan to keep this situation the same for the future.

⇒ OECD numbers may increase in the future, dependent on management decision, based on various international political developments that may affect maritime legislation.

⇒ Fundamental requirement ,beyond maritime skills, is English language.

⇒ Korean seafarers employed by my company, will only be Officer ranks only in the near future. Due to stable supply of fresh Officers from Maritime Institutions, the number of Korean Officers will steadily increase (in our Company), but we are looking for other alternative sources of Ratings (not OECD origin).

⇒ If manning budget constraint is removed, it is quite natural to employ OECD Officers, due to quality and training standards.

⇒ Manning budget is the most important factor in the selection of seafarers – the former long term strategy of employing OECD seafarers has already disappeared and most owners / managers stick to the short term results.

⇒ In many OECD countries, the foundation of Officers education / training and on board service has crumbled. Shipping companies in these countries have to rely on ex Officers of non OECD for office staff, if they want ex seafarers. Employment of non seafarers for office staff will surely increase, except technically sensitive posts, such as Technical Superintendents.

⇒ OECD Officers are needed for technical and commercial demands of high horsepower DP tonnage, working in the international oil supply sector.

⇒ OECD Officers will, as the standards of both taxation and living in OECD countries, rise, remain expensive against the third world core seafarers. However, as currencies shift, it is quite possible that, in twenty years, Chinese seafarers (for instance) will be more expensive than Europeans. Third world areas, with a low tax base, will remain comparatively cheap, for the foreseeable future. OECD seafarers will have to concentrate on high margin / high tech vessels.

⇒ Prefer to use OECD Ratings for domestic trades.

⇒ More must be done by governments and industry in Canada to promote domestic shipping. More training funds must be made available.

⇒ Shore Offices must continue to improve cost control.

Case Study (A) is also relevant.

Conclusions:

The overriding concern is that the likely demise of the OECD seafarer is primarily cost driven, albeit that such personnel are considered vital for, later, shore based employment and, for technical expertise, OECD seafarers are seen to be the best. Many believe that government sponsorship / subsidy is required to reduce (to employers) the cost of OECD seafarers.

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OWNERS

Question 1: **To what extent do you consider the following when buying new or second hand ships or marine equipment?**

Efficiency of the ship / equipment = 92%
Reliability of the design / new equipment = 80%
The needs of the possible / potential Clients = 67%
Simplicity of design / equipment used on board = 45%
Manning levels on board = 11%
Training needs of ship's personnel = 0%

Other:
Cost / benefit analysis
Price

Question 2: **What major developments do you anticipate in shipbuilding and marine equipment manufacturing over the next 5 - 10 years?**

More efficient main engines, fuel to power speed = 78%
IT / software / computer monitoring = 67%
Decreased maintenance = 64%
Increased reliability = 45%
Increased effectiveness in surface protection - paints, etc = 45%
Larger ships = 10%

Other:
Environmental

Question 3: **Do you think that, in general, Marine Training Establishments provide sufficient specific training in the knowledge, care and maintenance of the following?**

Modern main propulsion units = 75%
Onboard equipment and ancillary systems = 68%
Importance of fuel and oil analysis = 50%
IT / computer monitoring = 45%
Up to date software and computer equipment used onboard = 35%

Other responses concerned:

Training in Hull & Tank Coating Care and the view that technology outstrips practice.

The view that Marine Training Establishments are not always producing "hands-on" Engineers.

Question 4: **With regard to new / second hand ships or equipment, do manufacturers / suppliers provide sufficient training or instruction manuals?**

Yes = 53%
No = 40%
Sometimes = 7%

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Question 5: With regard to new / second hand ships or equipment, does your Company provide training or instruction to the following?

Senior office managers of the ship	Yes = 74%	No = 26%
All seafarers due to work on the ship	Yes = 69%	No = 31%
Shore based maintenance staff / Superintendents	Yes = 64%	No = 36%
Marine training establishment personnel	Yes = 36%	No = 64%

Other:
Owner's representative

Question 6:   In what media do you supply manuals?

Hard copy = 90%
Video   = 69%
CD   = 60%

Other:
In-house training

Question 7:   In which language are the following equipment / design manuals produced?

All information is available in English, with 20% of training manuals also being carried in the crew language.

Question 8:   Do you send these manuals, CDs, videos to any training establishments?

72% do not send information to any training establishments.

Question 9:   In respect of your Company / Organisation, approximately what % of employees are?

Former seafarers   Range = 0% to 100%   Average = 61%
90% of Companies employ ex-seafarers

OECD former seafarers   Range = 0% to 100%   Average = 54%
90% of former seafarers employed are from the OECD

Question 10:   Do you believe this figure will increase or decrease over the next 5 - 10 years?

No change in OECD or non OECD former seafarers   = 59%
Decrease in OECD former seafarers / increase in non OECD former seafarers = 17%

Comments from Respondents:

⇒ OECD seafarers are coming ashore earlier than before, this causing negative impact on lower experience levels that require more training on practical issues.

⇒ There will be a reduction in employing OECD seafarers, primarily due to severe pressure on crew budget cost levels.

⇒ There is a need to improve seafarer/office staff interpersonal skills and financial awareness.

⇒ It is becoming more difficult to find correct skill levels of office staff and costs will probably rise.

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Conclusions:

$\Rightarrow$ The level / interest of training, to be provided to seafarers, appears to relate, quite significantly to the country of decision making - ie the ship owner or ship manager.

$\Rightarrow$ There does not appear to be sufficient liaison / interaction between the operators / owners of vessels and training establishments.

$\Rightarrow$ Repeatedly, there is a message that advanced marine technology is outstripping practice - ie training is falling further behind, all the time.

$\Rightarrow$ Increasingly there are concerns over decreasing numbers and skill levels of experienced OECD seafarers.

$\Rightarrow$ Similar to the views of ship builders / equipment manufacturers, owners are looking at reliability / efficiency factors when buying new and second hand tonnage.

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SHIP BUILDERS / EQUIPMENT MANUFACTURERS   **QUESTIONNAIRE 3 - ANALYSIS**

Question 1: **To what extent do you consider the following when developing or introducing a new ship design and / or equipment?**

Reliability of the new design / new equipment = 80%
Efficiency of the design / new equipment   = 60%
Simplicity of design / equipment used onboard = 60%
The needs of the Clients   = 60%
Manning levels on board   = 18%
Training needs of ships' personnel   = 12%

Question 2: **What major developments do you anticipate in shipbuilding and marine equipment manufacturing over the next 5 - 10 years?**

Decreased maintenance   = 80%
Increased reliability   = 60%
More efficient main engines, fuel to power speed   = 60%
IT / software / computer monitoring   = 35%
Larger ships   = 20%
Increased effectiveness in surface protection - paints, etc = 15%

Other:
Automated mooring and design implications
Cost

Question 3: **Do you think that, in general, Marine Training Establishments provide sufficient specific training in the knowledge, care and maintenance of?**

Modern main propulsion units
Importance of fuel and oil analysis
Onboard equipment and ancillary systems
Up to date software and computer equipment used on board
IT / computer monitoring

All answers to these questions were in the negative.

Question 4: **With regard to new design or equipment, does your Company provide training or instruction to the following?**

All relevant seafarers due to work on the ship   Yes = 75%   No = 25%
Senior office managers of the ship   Yes = 60%   No = 40%
Shore based maintenance staff / Superintendents   Yes = 40%   No = 60%
Marine training establishment personnel   Yes = 25%   No = 75%

Question 5: In what media do you supply manuals?

Hard copy = 100%
CD   = 60%
Video   = 20%

Other:
E-mail

Question 6: **In which language are the following equipment / design manuals produced?**

English = 100%
Native language of supplier = 100%
One other language (predominantly French) = 100%

Question 7: **Do you send these manuals, CDs, videos to any training establishments?**

No = 80%

Question 8: **In respect of your Company / Organisation, approximately what % of employees are former OECD/non-OECD?**

Former seafarers   Range = 1% to 20%   Average = 5%
90% of Companies employ ex-seafarers

OECD former seafarers   Range = 1% to 20%   Average = 4%

Question 9: **Do you believe this figure will increase or decrease over the next 5 - 10 years?**

No change in OECD or non OECD former seafarers = 100%

Comments from Respondents:

⇒ Factory visits should be part of training, eg to rope makers

Conclusions:

⇒ By and large, future ships are expected to be more reliable, more efficient, with reduced maintenance.

⇒ As regards documentation, and perhaps somewhat surprisingly in today's technological world, manuals are likely to continue, predominantly, in hard back style and in a variety of languages.

⇒ In all responses, it is felt that update / product training, from marine training establishments, is insufficient.

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APPENDIX 1

TRAINING AND DEVELOPMENT   **QUESTIONNAIRE 4 - ANALYSIS**

Question 1: **What is the approximate number of marine training staff (excluding catering, etc) within your College / Establishment?**

Average number of employees = 36

Question 2: **In respect of your College / Establishment, approximately what % of marine staff are:**

Former seafarers   = Average 76%
OECD former seafarers = Average 65%

Only one training organisation did not have ex-seafarers on the staff and that organisation uses ex-seafarers as consultants.

Question 3: **Do you believe this figure will increase or decrease over the next 5-10 years?**

OECD former seafarers: Increase   = 50%
                              Decrease   = 0%
                              Stay the same = 50%

Non OECD former seafarers: Increase   = 48%
                              Decrease   = 25%
                              Stay the same = 27%

Question 4: **For what reason do you believe your College / Establishment ideally requires ex-seafaring personnel?**

Practical shipboard experience = 80%
Technical knowledge   = 70%
Personnel experience   = 40%
English language knowledge   = 10%
Legal reasons   = 0%

Other reasons include: Safety Training and qualifications

Do you see the availability of such staff declining over the next 5-10 years?

Yes = 88%
No   = 12%

Question 5: **What are the main areas of shipping industry related training that your College / Establishment provides?**

STCW short courses	= 70%
Simulator training - bridge team watchkeeping, etc	= 70%
Engineer Cadet / Officer training for certification	= 60%
Rating training - including for STCW certification	= 60%
Specialist training - tanker familiarisation, crowd control, etc	= 60%
Deck Cadet / Officer training for certification	= 50%
Management	= 40%
Commercial (including shipping related business)	= 40%

Electro-Technical Officer training for certification   = 30%
IT   = 30%
Specialist training for the offshore industry   = 10%
Anti pollution training   = 10%
Finance   = 10%

Other:
Hotel and Catering
Cargo Operations
Economics of Sea Transport & International Trade,

Question 6: **Is your College / Establishment able to provide seafarers with other training specifically requested by ship owners / operators?**

Yes = 100%

Question 7: **Do you think, in general, that marine (seafarer) training / working experience provides sufficient specific preparation for those wishing to take up shore employment within the industry at a later date?**

Yes = 40%
No   = 60%

If no, can you please indicate areas for further training:

Operational practices - budgets, legal, etc   = 50%
Management strategy - QA / ISM Code, marketing, finances, etc = 50%
Management skills - communications, meetings, reports, etc   = 50%
Office technology - IT, communications, etc   = 40%
Personnel skills - handling staff, client relationships, etc = 40%

Other:
ICS Qualifying exam

Question 8: **Does your College / Establishment presently provide seafarers with training specifically designed to prepare for working in shore-based positions?**

Yes = 40% including: Marine engineering / operations degree
No   = 60%

Question 9: **Does your College / Establishment presently provide shore-based personnel with training in marine skills required for working in the general shipping industry?**

Yes = 30%
No   = 70%

Do you believe such training will increase or decrease over the next 5-10 years?

Increase   = 70%
Decrease =   0%
Stay the same = 30%

Question 10: **Do you think, in general, that shipbuilders and equipment manufacturers provide Marine Training Establishments with sufficient specific information in the knowledge, care and maintenance of the following?**

Modern main propulsion units	= 57% yes / 43% no
Importance of fuel and oil analysis	= 50% yes / 50% no
Onboard equipment and ancillary systems	= 57% yes / 43% no
Up to date software and computer equipment used onboard	= 43% yes / 57% no
IT / computer monitoring	= 17% yes / 83% no

Other:
On request

Question 11: **In what media do you disseminate such information to trainees?**

Lectures = 100%
Hard copy = 90%
CD = 50%
Video = 50%

Other:
Projects
Computer based training
Simulators
E-mail
Web and multimedia

Question 12: **Is your College / Establishment expecting changes in the levels of training over the next 5-10 years?**

Increase = 90%
Decrease = 0%
Stay the same = 10%

Question 13: **Research so far appears to suggest major developments are anticipated in shipbuilding and marine equipment manufacturing, over the next 5-10 years, in the following areas - do you anticipate your College / Establishment being prepared for changed / new training needs?**

Larger ships	= 70% yes
Increased reliability	= 70% yes
IT / software / computer monitoring	= 60% yes
Environmental issues	= 60% yes
Decreased maintenance	= 50% yes
More efficient main engines - fuel to power speed	= 50% yes
Increased effectiveness in surface protection - paints, etc	= 45% yes

Question 14: **Do you anticipate changed / new training needs in any other areas?**

Yes = 50%

If yes, can you please identify these areas?

- Human relations and management, Operational management, Legal knowledge

- Modern ships need training in office practices eg IT and other non-marine topics; advanced technical knowledge eg control instrumentation and communication systems
- Port infrastructure, Agency and marine surveying
- Security, terrorism and environmental matters

Comments from Respondents:

⇒ Today's college students arrive with very little practical experience, and this must be a high priority area in future - ie practical training.

⇒ A career path needs to be created to attract new entrants to the industry, enabling them to move to the highest level within shipping, whether in a lecturer or administration role.

⇒ Seafarers, once they are "in class" with STCW qualifications, must have the opportunity to study and qualify to various academic levels (BSc and higher) - there needs to be a blend between practical and theoretical learning.

⇒ Where do we get the time to do all this extra training / education and still produce people with the proper professional training to operate ships safely and efficiently?

Conclusions:

⇒ Overwhelmingly, training organisations employ ex-seafarers and the vast majority of ex-seafarers working in training in the OECD countries are OECD nationals and they confirm that the demand for OECD in the future will not diminish.

⇒ Somewhat as a contradiction, the respondents state that the availability of such staff will decline by as much as 80% over the next five to ten years. This poses the question, from where will the future supply be sourced?

⇒ Though the majority of training organisations believe that seafarers do not receive sufficient preparation for taking up a shore career and identified a range of deficiencies in normal management skills, they, themselves (ie the colleges) do not provide any specific courses / training to provide for them - this deficiency was also highlighted by owners and manufacturers.

⇒ Only a minority or organisations provide training for shore-based personnel, yet the vast majority think this area will increase in the next 5-10 years.

⇒ On a positive note, the majority of training colleges believe they will be well prepared for future training needs, which will emerge as a result of changes in the industry.

SEAFARERS

Question 1:   **At what age did you start your training (either ashore or afloat)?**

Average age = 19 years

Question 2:   **How long have you been at sea (from the start of your training)?**

Range = 1 to 31 years
Average time at sea = 20 years

Question 3:   **In normal circumstances, how much longer do you think you will stay at sea?**

Range = 4 to 23 years
Average number of years = 12

Question 4:   **If you come ashore in the future, would you like your career to continue within the marine industry?**

Yes = 80%
No = 20%

Question 5:   **Do you feel your training and experience to date has prepared you for a career ashore within the marine industry?**

Yes = 70%
No = 30%

If no, what extra training / experience do you think would help?

- Ranks divided into Senior / Junior to indicate the difference in experience
- Frequent courses and training necessary to keep education up-dated
- Have been employed in office and find office / ship useful – provides good knowledge and understanding of why and how tasks are carried out at either end
- Business administration, quality management & computers
- General office training
- Personnel and personnel management

Comments from Respondents:

⇒ Not many careers in the marine industry ashore hold much appeal
⇒ Depends on the next job
⇒ Modern training system should better prepare future moves into shore jobs

Question 6:   **Please choose what you consider to be the main attractions of a seafaring career in your country?**

Pay and conditions   = 70%   Travel   = 27%
Job satisfaction   = 50%   Perceived to be a highly regarded job   = 20%
Attractive career prospects = 40%   Training   = 10%
Independence   = 40%   Other - Very few people know about it
Job security   = 30%

Question 7:   **Has your career, so far, followed your expectations?**

Yes = 88%
No = 12%

   If not, why not?

- We the seafarers have little or no input in determining conditions and quality of life

- There is no support from the government

- Rules and regulations are put aside in favour of profit

- Seamen are expendable

- Working with a fleet for 19 years and when the time came for promotion, the company closed and had to restart.

Question 8:   **Do you feel more could be done to improve the status and image of a seafaring career?**

Yes = 71%
No = 29%

If yes, what / how?

- Higher appreciation in society would make it more attractive to young people, More appropriate image, Effective advertising - few people away from the coast are aware that MN exists, Greater public awareness. Most people inland are unaware of MN existence (except to use a ferry). General public should be better informed about profits and risks of work at sea, Ignorance in general public – lack of understanding of role of MN, More publications (TV Broadcast) on duty and off duty, Let the "media" talk about seafarer's life so shore people know who they are. Television program about life on board and home.

- Make public aware of appalling abuses by shipping companies, appoint a specific government department to tell the "truth" then rectify it.

- Internet access with family

- Salary: globalisation has squeezed European salaries, no incentive to start career, Assignment period onboard be reduced: expectations, demands, trades, mixing nationalities make the job harder and heavier, Image is mostly dependent on money – increase money increase image, Tax free (world wide)

- Professionalism of seafarer: has dropped dramatically on recent years, despite all requirements of STCW. Officers are not more professionally prepared as in the past where they attended several years at nautical college, Education for engineers in management and navigation in order to become Chief of vessel (Master), Change sea structure – use the right people for the right job, Increase independence of Master from office.

- More flexible education – using same education as shore based career allows change sea/shore, Better information regarding education (few people know about the work at sea), Seafaring career should be taken into account in shore jobs, Need to be told what kind of job you can take ashore after Maritime Academy (Career)

- Better National (Polish) Law

- Poor incentive for recruitment, poor conditions, apathy of national government, no security, apathy of employers. Priority is profit. Mostly management companies now, Low public profile in media.

Question 9: **Do you consider present training of seafarers in your country is adequate?**

Officers   Yes   = 40%
                  No   = 60%

Ratings   Yes   = 77%
                  No   = 23%

If no, what categories of extra skills are required?

Management	Officers = 30%	Ratings = 0%
Engineering	Officers = 30%	Ratings = 5%
Cargo handling	Officers = 15%	Ratings = 10%
IT	Officers = 10%	Ratings = 5%
Specialised navigation equipment	Officers = 10%	Ratings = 0%

Question 10: **In what media do you consider onboard training / instruction material is best delivered?**

Hard copy	Officers = 55%	Ratings = 15%
CD	Officers = 55%	Ratings = 15%
Video	Officers = 40%	Ratings = 40%

Other:
Officers learning by doing
Training by more experienced crew
Ratings told and shown

Question 11: **In your opinion, will the training of seafarers over the next 5-10 years be affected by changes in the following?**

Operational practices - ship size, cargo facilities, etc
          Increase   = 40%
          Decrease   = 10%
          Stay the same = 50%

Management practices - QA/ISM Code, centralisation/decentralisation of responsibility, etc
          Increase   = 73%
          Decrease   = 10%
          Stay the same = 17%

Onboard technology - IT, communications, etc
          Increase   = 60%
          Decrease   = 5%
          Stay the same = 35%

Ship design - automation, maintenance, equipment, etc

        Increase   = 73%

        Decrease   = 10%

        Stay the same = 17%

Comments from Respondents:

⇒ Engineers: well educated on completion of education but longer period with practical training onboard could be desired, 7-10 days of extra training does not make Officers ready to take over responsibilities, Training is a complementary act to the preparation of seafarers and not priority one, Too much concentration on automation and not enough on basic principles (ie navigation without radar / gyro etc), Euro Engineers perceived as professional/skilled Officers - now are operators only; too little time spent on practical repair and workshop training. (some Engineers don't know which end of a hammer should be in the hand), Presently we see training more and more pretend to substitute for the lack of basic preparation that is schools responsibility to perform, Junior Officers with paper qualifications and no manual / practical skills.

⇒ Not teaching leadership skills to young (even onboard not allowed to take charge of an operation eg tying up the ship), NVQ portfolio is too repetitive and unclear, Dual Officers are being implemented but present crews have no experience with them, Need dual purpose Officers, Increase training time (onboard and ashore) does not give expected affect.

⇒ Crew decreased in spite of limitation of working hours and the increase of maintenance of ship. Training time onboard is not defined (does it come under work or rest)

⇒ Every higher license and step in career should be connected with opinions from previous ship written by master and heads of departments (Assessment?)

Question 12: **Most ships are still manned in the standard way of three departments of Deck, Engine and Catering - do you feel this is still appropriate today?**

        Yes = 85%

        No = 15%

Question 13: **Does the industry still need the onboard structures of Officers and Ratings?**

        Yes = 100%

Question 14: **If no to either Question 12 or Question 13, can you suggest a more effective way of shipboard organisation?**

- System should be - dedicated operators of the ship (Officers), dedicated maintainers (Technicians) and training group (who would become Officers or technicians)

- Chief of vessel (navigator or engineer) - re-educate present staff until dual Officers have experience, then Deck / Engine structure

- Chief Engineer - all maintenance / Master - all commercial

Question 15: **Do you believe it is possible to plan and develop a long term marine career, which includes both sea service and periods ashore in the office, on a continuously rotating basis (obviously with varying financial rewards)?**

        Yes = 73%

        No = 27%

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Comments from Respondents:

⇒ Aspects that dictate ie cost, nationality, location

⇒ Present situation comes from tradition and small changes could be made, but now and in the future the ship needs Master and crew.

⇒ Future ship operations require more cooperation and overlapping jobs

⇒ Better / open contact between office / ship give better understanding of jobs. Planning, organisation and cooperation between office / ship

⇒ Command structure clear (and should be retained), but more attention to training (new staff) needs to be reviewed.

⇒ Only advertising is bad - about tanker grounding / collision

⇒ Industry in a crisis situation which is deteriorating NOT improving. It will get much worse before it gets better.

⇒ National pride is gone for the MN

⇒ Officers should be more specialised in task on board. Employ a secretary onboard to deal with the paper work, like the smallest enterprise ashore.

⇒ "Wouldn't recommend anyone to start out now."

Conclusions:

⇒ Concerns exist regarding certain aspects of a seafaring career and the image of the marine industry. Frank opinions are also stated with views on training and a combined sea / shore route.

⇒ This questionnaire can be read in conjunction with the Case Study (C) regarding the ship visit.

SHIP OWNERS' ORGANISATIONS   **QUESTIONNAIRE 6 - ANALYSIS**

Question 1 : **Is it possible to advise, approximately, how many ships in total are operated by your members?**

Total   = 2,518

Tankers   = 30%
Passenger / Cruise / Ferries   = 16%
Dry cargo / Bulkers / Reefers = 35%
Specialist - Cable Layers / etc = 15%
Others   = 4%

Question 2 : **Is it possible to advise, approximately, how many seafarers, in total, of all nationalities are employed / managed by your members?**

Total Officers covered by survey   = 31,163
Total Ratings covered by survey   = 52,493
Total seafarers covered by survey = 83,656

Question 3 : **Is it possible to estimate how many OECD seafarers from your country, in total, are employed / managed by your members?**

Total OECD Officers covered by survey   = 12,283
Total OECD Ratings covered by survey   = 16,458
Total OECD seafarers covered by survey = 28,741

OECD Officers as a percentage of total Officers   = 39%
OECD Ratings as a percentage of total Ratings   = 31%
OECD seafarers as a percentage of the total seafarers   = 34%

Question 4 : **What do you believe are the main reasons why OECD seafarers are employed by your members?**

Commercial / Management skills	Officers = 75%	Ratings = 25%
Owners choice	Officers = 75%	Ratings = 75%
Skill / Specialisation for ship type	Officers = 75%	Ratings = 75%
English speaking	Officers = 50%	Ratings = 50%
Flag requirement	Officers = 50%	Ratings = 50%
Availability	Officers = 25%	Ratings = 25%
Trading area	Officers = 25%	Ratings = 50%
Union pressure	Officers = 25%	Ratings = 50%
Cost	Officers = 0%	Ratings = 0%

Question 5 : **Do you predict, in the present circumstances, that the number of OECD seafarers from your country and employed / managed by your members, over the next 5 - 10 years, will increase or decrease and by what %?**

OECD Senior Officers	Increase	= 25%
	Decrease	= 50%
	Stay the same	= 25%
	Average change	= Decrease of 15% per Organisation

<table>
<tr><td>OECD Junior Officers</td><td>Increase</td><td>= 25%</td></tr>
<tr><td></td><td>Decrease</td><td>= 50%</td></tr>
<tr><td></td><td>Stay the same</td><td>= 25%</td></tr>
<tr><td></td><td>Average change</td><td>= Decrease of 15% per Company</td></tr>
</table>

OECD Junior Officers	Increase	= 25%
	Decrease	= 50%
	Stay the same	= 25%
	Average change	= Decrease of 15% per Company
OECD Ratings	Increase	= 25%
	Decrease	= 50%
	Stay the same	= 25%
	Average change	= Decrease of 15% per Company

Question 6 : To ensure a positive future for OECD seafarers what, in your opinion, must be done to ensure their future employment?

Officers
Increased government subsidies for training	= 100%
Lower total cost of employment	= 75%
Increased number of seafarers	= 75%
Increased motivation	= 75%
Increased training / onboard skills	= 50%
Increased management skills	= 25%
Shorter / more economical initial training	= 0%

Ratings
Increased government subsidies for training	= 100%
Increased motivation	= 100%
Lower total cost of employment	= 75%
Increased number of seafarers	= 75%
Increased training / onboard skills	= 25%
Increased management skills	= 0%
Shorter / more economical initial training	= 0%

Question 7 : To your knowledge, do your members currently train OECD, new entrant, seafarers?

Officers   Yes = 75%
            No = 25%

Ratings   Yes = 50%
            No = 50%

Main reasons:

Officers	To provide future seagoing personnel	= 75%
	To provide future company shore staff	= 75%
	Trading areas	= 25%
	For tonnage tax reasons	= 25%

Ratings	To provide future seagoing personnel	= 50%
	Trading areas	= 25%
	To provide future company shore staff	= 25%
	For tonnage tax reasons	= 25%

Question 10 : Do you consider current OECD seafarers need extra skills to serve onboard ?

Officers   Yes = 75%   Ratings   Yes = 25%
            No = 25%   No = 75%

Main reasons:

Officers   Management   = 75%
            Engineering   = 75%
            IT   = 50%
            Cargo handling   = 50%
            Specialised navigation equipment = 25%

Ratings   Management   = 25%
            Cargo handling   = 25%
            Engineering   = 0%
            IT   = 0%
            Specialised navigation equipment = 0%

Question 9 : In your opinion, will manning numbers of ships over the next 5-10 years be affected by changes in the following

Operational practices - ship size, cargo facilities, etc
Increase   = 50%
Decrease   = 25%
Stay the same = 25%

Management practices - QA/ISM Code, centralisation/decentralisation of responsibility, etc

Increase   = 25%
Decrease   = 25%
Stay the same = 50%

Onboard technology - IT, communications, etc
Increase   = 25%
Decrease   = 25%
Stay the same = 50%

Ship design - automation, maintenance, equipment, etc
Increase   = 25%
Decrease   = 25%
Stay the same = 50%

Question 10 : Do you think, in general, Marine Training Establishments, in your country, provide sufficient training in the knowledge, care and maintenance of the following:

Onboard equipment and ancillary systems   = 100%
Modern main propulsion units   = 75%
Importance of fuel and oil analysis   = 75%
IT / computer monitoring   = 50%
Up to date software and computer equipment used onboard = 50%

Question 11 : In respect of your Organisation, from where do you recruit shore staff?

OECD staff   University graduates   = 100% of Organisations
                   Former seafarers   = 75% of Organisations
                   Ex naval (military) personnel = 75% of Organisations

Non OECD staff   University graduates   =   0% of Organisations
                   Former seafarers   =   0% of Organisations
                   Ex naval (military) personnel =   0% of Organisations

Question 12 : **Approximately what % of employees are?**

Former seafarers   = Average 25%
OECD former seafarers = Average 23%

Question 13 : **Do you believe this figure will increase or decrease over the next 5 - 10 years?**

OECD former seafarers   Increase   = 33%
                               Decrease   = 33%
                               Stay the same = 33%

Non OECD former seafarers   Increase   = 50%
                               Decrease   = 0%
                               Stay the same = 50%

Question 14 : **In your opinion, does the shore based management of ships today ideally require ex seafaring personnel?**

Quality & Safety   Yes = 75%
                                             No   = 25%

Fleet Management - Operations / Technical   Yes = 100%
                                             No   =   0%

Fleet Personnel   Yes = 50%
                                             No   = 50%

Question 15 : **In your opinion, will the number of shore based staff involved in the management of ships over the next 5-10 years be affected by changes in the following?**

Operational practices - crew size, ship size, cargo facilities, etc
Increase   = 50%
Decrease   = 25%
Stay the same = 25%

Management practices - QA / ISM Code, office location, centralisation, etc
Increase   = 75%
Decrease   = 0%
Stay the same = 25%

Office technology - IT, communications, etc
Increase   = 25%
Decrease   = 25%
Stay the same = 50%

Ship design / technology - automation, maintenance, IT, communications, etc
Increase   = 25%
Decrease   = 0%
Stay the same = 75%

Question 16 : **What does your Organisation / members think is needed to make seafaring an attractive career for people to join and remain?**

More pay
Officers = 25%
Ratings = 25%

Improved employment conditions (eg leave ratio, etc)
Officers = 25%
Ratings = 25%

Fiscal advantages (eg tax reductions)
Officers = 100%
Ratings = 50%

Career path at sea with subsidised training
Officers = 100%
Ratings = 25%

More ship and trade flexibility (ie no seniority penalty for changing companies)
Officers =   0%
Ratings =   0%

Defined career path at sea and ashore (if desired)
Officers = 100%
Ratings = 25%

Conclusions:

⇒ Of the responses received, the view was unanimous for increased support / subsidy to offset the cost of OECD seafarers. The future use of OECD seafarers on board was mixed but, as a collective perceived overview, both Officer and Rating numbers will reduce over the next decade.

MARINE SHORE GROUPS   **QUESTIONNAIRE 7 - ANALYSIS**

Question 1 : What is the main area of your Company / Organisation's work?

Replies embraced National Bodies, P&I Clubs, Commercial Trainers and Governments, with Governments making up 50% of the respondents.

Question 2 : What is the approximate number of employees within your Company / Organisation?

Average number of employees = 140.

Question 3 : In respect of your Company / Organisation, approximately what % of employees are

Former seafarers   = 17% average
Former OECD seafarers = 16% average

Note: Nearly all respondents employed former OECD seafarers.

Question 4 : Do you believe this figure will increase or decrease over the next 5 - 10 years?

Former OECD seafarers :   Increase   = 30%
                            Decrease   = 30%
                            Stay the same = 40%

Former non OECD seafarers : Increase   = 75%
                            Decrease   = 0%
                            Stay the same = 25%

Question 5 : In your opinion, for what reason does your Company / Organisation ideally require ex-seafaring personnel?

Practical shipboard experience = 100%
Technical experience   = 100%
Personnel experience   = 70%
English language knowledge   = 40%
Legal reasons   =   0%

Question 6 : If the supply of ex-seafaring OECD personnel declines, what will your Company / Organisation provide as a substitute?

Recruit or increase the number of non OECD personnel   = 90%
Recruit ex-naval (military) personnel   = 40%
Train present non-seafaring staff with marine skills   = 40%
Recruit and train new entrant staff with marine skills (eg graduates) = 40%

Question 7 : Does your Company / Organisation presently provide ex-seafaring staff with training in office / management skills?

Yes = 80%

Question 8 : Does your Company / Organisation presently provide non-seafaring staff with training in marine skills?

Yes = 65%

Question 9 : Do you think, in general terms, marine training establishments provide sufficient specific training for seafarers wishing to take up shore employment?

Operational practices (budgets, legal, etc)	= 30% yes / 70% no
Management strategy (QA/ISM Code, marketing, finances, etc)	= 70% yes / 30% no
Office technology (IT, communications, etc)	= 70% yes / 30% no
Personal skills (handling staff, client relationships, etc)	= 60% yes / 40% no
Management skills (communications, meetings, reports, etc)	= 50% yes / 50% no

Comments from Respondents:

⇒ Many seafarers require substantial additional training to make a successful transition to shore based employment, bur experience is invaluable.

⇒ OECD personnel are still highly respected and trusted.

⇒ Certain non-OECD personnel have shown and continue to show potential.

Conclusions:

⇒ Overwhelmingly, shore based organisations confirm they require, now and in the future, ex mariners, from whatever source, to fill key roles. However, the majority of ex seafarers working ashore in OECD countries are, in fact, OECD nationals.

⇒ Former seafarers coming ashore lack (by and large) the necessary skills for the new environment and training in the "new skills" is provided by most individual organisations. The majority view is that current marine training does not provide sufficient specific training for seafarers coming ashore.

⇒ Formal naval personnel are a source of shore based workers.

⇒ Finally, if OECD seafarers are unavailable for shore positions then, in the majority of cases, it is believed that non OECD personnel have the potential to fill the required positions.

(The above is illustrated by Case Study (A))

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THE AVAILABILITY AND TRAINING OF SEAFARERS - FUTURE IMPACT   OECD PROJECT

Precious Associates Limited ("PAL") has been appointed by the Organisation for Economic Co-operation and Development ("OECD"), to undertake project work on the future demand for OECD seafarers and skills required to operate the ships of the future. PAL is supported in this study by Captain Roger Holt of Knightsmart Limited.

This note introduces the subject and, as appropriate, seeks your support and input.

A few further details are:

⇒ **OECD**

This international organisation brings together 30 countries, sharing a commitment to democratic government and the market economy. All OECD countries, to a greater or lesser extent, have a maritime infrastructure which is supported, in turn, by national seafarers and, in the majority of cases, by national flag vessels. The countries are listed overleaf.

⇒ **PAL**

Precious Associates Limited is an independent consultancy Company, offering specialist services in all human resource / personnel management areas, with particular knowledge of the marine industry.

⇒ **Objective**

This is to examine the impact of future developments in ship design and construction, technology and management, and operational practices on the demand for ships crews, both in terms of numbers and skill levels. It is also to examine the effect that a shortage of OECD seafarers would have on the operation of national fleets and associated shore based maritime functions.

⇒ **Participation**

Whenever possible and subject to the approval of the Sponsor (OECD), contributing participants will share in the overall analysis and summaries of views - especially questionnaire feedback.

⇒ **Confidentiality**

We are conscious of the sensitivity of much Company data and confirm that no individual Company details will be reported.

We do hope you will be able to assist by completing and returning the attached brief, hopefully user friendly, questionnaire - by Friday 11th October.

Please let us know if you would like the questionnaire sent electronically.

Thank you.

PAL   **Fax: +44 (0)1444 441027**
September 2002   **E-mail: pal@preciousassociates.ltd.uk**

Definitions

$\Rightarrow$ <u>OECD member countries</u>

Australia	Hungary	Norway,
Austria	Iceland	Poland
Belgium	Ireland	Portugal
Canada	Italy	Slovak Republic
Czech Republic	Japan	Spain
Denmark	Korea	Sweden
Finland	Luxembourg	Switzerland
France	Mexico	Turkey
Germany	Netherlands	United Kingdom
Greece	New Zealand	United States

$\Rightarrow$ <u>Senior Officers</u>

Master, Chief Officer, Chief Engineer, Second (First Assistant) Engineer

$\Rightarrow$ <u>Junior Officers</u>

All Deck and Engineer Officers excluding the above

$\Rightarrow$ <u>OECD</u>

As above

$\Rightarrow$ <u>Central / East Europe</u>

In seafaring terms, Croatia, Latvia, Russia, Ukraine, etc, etc

• <u>Indian Sub-continent / Far East</u>

India, China, Indonesia, Pakistan, Philippines, Sri Lanka, etc, etc

PRECIOUS ASSOCIATES LIMITED **PAL**

THE AVAILABILITY AND TRAINING OF SEAFARERS - FUTURE IMPACT   **OECD PROJECT**

Please return the completed questionnaire to:

Precious Associates Limited   **Fax: + 44 (0)1444 441027**

From (name) ....   **Contact details (fax)** ....

Position in Company ....   **Date** ....

Company ....   **Country** ....

PART A - GENERAL

Question 1:   How many ships do you operate ?

Tankers	
Passenger / Cruise / Ferries	
Dry cargo / Bulkers / Reefers	
Specialist - Cable Layers / etc	
Others	

Question 2:   How may seafarers, in total, of all nationalities does your company employ / manage ?

Senior Officers	
Junior Officers	
Ratings	

PART B - OECD SEAFARERS

Question 3:   How many OECD seafarers does your company employ / manage ?

Note: Please see covering note for OECD countries.

Senior Officers	
Junior Officers	
Ratings	

Question 4:   What are the main reasons your Company employs / manages OECD seafarers - please ✔ the 4 most important ?

	Officers	Ratings
Availability		
Commercial / Management skills		
Cost		
English speaking		
Flag requirement		
Owners choice		
Skill / Specialisation for ship type		
Trading area		
Union pressure		

Question 5:   Do you predict, in the present circumstances, that the number of OECD seafarers employed / managed by your Company, over the next 5 - 10 years, will increase or decrease and by what % ?

Senior Officers	Increase / Decrease / Stay the Same	%
Junior Officers	Increase / Decrease / Stay the Same	%
Ratings	Increase / Decrease / Stay the Same	%

Can you briefly say why ?

Question 6:   In an employment market with no constraints whatsoever, which nationality of seafarer would you choose for your fleet - please rank each in order of preference starting with 1 for your first choice.

Senior Officers

OECD	
Central / East Europe	
Indian Sub-continent / Far East	

Junior Officers

OECD	
Central / East Europe	
Indian Sub-continent / Far East	

Ratings

OECD	
Central / East Europe	
Indian Sub-continent / Far East	

Can you briefly say why ?

Question 7:   To ensure a positive future for OECD seafarers what, in your opinion, must be done to ensure that they are employable - please ✔ the 4 most important ?

	Officers	Ratings
Increased number of seafarers		
Lower total cost of employment		
Shorter / more economical initial training		
Increased government subsidies for training		
Increased training / onboard skills		
Increased motivation		
Increased management skills		

Question 8:   Is your Company currently training OECD, new entrant, seafarers ?

	Officer Cadets	Rating trainees
Yes		
No		

Question 8 continued: If yes, what are the main reasons - please ✔ the 3 most important ?

	Officers	Ratings
To provide future seagoing personnel		
To provide future company shore staff		
For tonnage tax reasons		
Trading areas		
Other (please briefly state)		

Question 9:   In your opinion, and using the same categories of OECD, Central / East Europe and Far East / India, please indicate which group of Officers you think should ideally serve in the following ship types.

	Senior Officers	Junior Officers
Specialist tankers - gas / chemical		
Standard tankers		
Passenger / Cruise ships		
Ferries		
Ro-Ros		
Container ships		
Dry cargo / bulkers / reefers		
Supply / Support vessels		
Specialist - Cable layers / etc		

Question 10:   Do your current OECD seafarers need extra skills to serve onboard ?

	Officers	Ratings
Yes		
No		

If yes, what categories of extra skills are required - please ✔ if appropriate ?

	Officers	Ratings
IT		
Management		
Specialised navigation equipment		
Cargo handling		
Engineering		

Question 11:   In your opinion, will manning numbers of ships over the next 5-10 years be affected by changes in the following - please ✔ as appropriate or leave blank if no change ?

	Increase	Decrease
Operational practices - ship size, cargo facilities, etc		
Management practices - QA / ISM Code, centralisation / decentralisation of responsibility, etc		
Onboard technology - IT, communications, etc		
Ship design - automation, maintenance, equipment, etc		

Do you have any other general comments on OECD seafarers - now and for the future ?

PART C - OFFICE STAFF

Question 12: In respect of your shore based fleet management operation, from where do you recruit staff - please ✔ as appropriate ?

	OECD	Non OECD
Former Company seafarers		
Former non Company seafarers		
University graduates		
Ex naval (military) personnel		
Other (please identify)		

Question 13: In respect of your shore based fleet management operation, approximately what % of employees are:

Former seafarers ?	%
OECD former seafarers ?	%

Question 14: Do you believe this figure will increase or decrease over the next 5 - 10 years ?

	OECD	Non OECD
Increase		
Decrease		
Stay the same		

Question 15: In your opinion, does the shore based management of ships today ideally require ex seafaring personnel - please ✔ as appropriate?

	Yes	No
Quality & Safety		
Fleet Management - Operations / Technical		
Fleet Personnel		

Question 16: In your opinion, will the number of shore based staff involved in the management of ships over the next 5-10 years be affected by changes in the following - please ✔ as appropriate or leave blank if no change ?

	Increase	Decrease
Operational practices - crew size, ship size, cargo facilities, etc		
Management practices - QA / ISM Code, office location, centralisation, etc		
Office technology - IT, communications, etc		
Ship design / technology - automation, maintenance, IT, communications, etc		

Do you have any other general comments on OECD office staff - now and for the future ?

Thank you.

**PAL
9/2002**

BIBLIOGRAPHY

The following list of publications, organisations, materials and internal sources have been researched and utilised in the preparation of this report. This list, which is shown in alphabetical order, is as extensive as possible, but is not exhaustive.

- BIMCO / ISF 2000 Manpower Update
- Compendium of Maritime Training Institutes (IMO)
- Drewry Shipping Consultants
- European Community Shipowners' Association Reports (ECSA)
- European Union reports
- Industry internet websites
- International Chamber of Shipping
- Knightsmart Library of Information
- Management Structures of Shipowners and Operators (MASSOP)
- Marine Information Ltd
- OECD data records
- PAL Library of Information
- Press items, including from Fairplay, Lloyd's List and NUMAST Telegraph

Note: Other relevant sources are identified in the main body of the report.