THE AMERICAN CLUB

CURRENTS

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SAFETY AT SEA

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THE AMERICAN CLUB 1915

AMERICAN CLUB NEWS

Diary

June 22, 2006	Annual Meeting	Palace Hotel New York
October 12, 2006	Reception	Shanghai
November 16, 2006	Board Meeting	Dubai

Management Changes

The following appointments have been made to the staff of Shipowners Claims Bureau Inc., the Managers:

Jamie Basha	Accounting
June Faas	Accounting
Richard Gayton	Surveys
Peter Husstege	Underwriting
Kyong Kim	IT
Aleksandr Sagalovskiy	IT

Newly Authorized PEME Clinics

Riga, Latvia

- *Maritime Poliklinika "Via Una".* 10 Katrindambis, Riga, LV-1045, LATVIA. Contact Persons: Dr. Irina Belokurova and Dr. Nikolajs Dmitruks. Phone: 371 732 2641.
- *Diplomatic Services Medicine Centre.* 57, Elizabetes str., Riga, LV-1050, LATVIA. Contact Persons: Dr. Pauls Vaivods & Dr. Silvija Lejniece. Phone: +371 722 9942, +371 728 0352. Fax: +371 728 9413. E-mail: dsmc@apollo.lv
- *SAI Latvijas Juras Medicinas Centre.* 10, Melidas str. Riga, LV-1015, LATVIA. Contact Persons: Dr. Skaidrite Riekstina & Dr. Valentina Volkova. Phone: +371 734 0636. Fax: +371 734 0341.
- *Dr. Andras Ergles, Konsultativa Poliklinika.* Private Practise Rigas 1, Slimnicas Konsultativa Poliklinika, 5. Bruninieku iela, Riga, LV-1001, LATVIA. Contact Person: *Dr. Andras Ergles.* Phone: +371 736 6323, +371 9250759.

Gdynia, Poland

- *Harbor Clinic.* Portowy Zespol Opieki Zdrowotnej, Spolka z o.o., ul. Chrznowskiego 3/5, 81-338 Gdynia, POLAND. Contact Person: Dr. Wanda Otto-Kot. Phone/Fax: +48 58 620 05 18. E-mail: portowy.zoz@poczta.neostrada.pl
- *Akademickie Centrum Medycyny Morskiej i Tropikalnej,Samodzielny Publiczny Szpital Kliniczny, Akademii Medycznej w Gdansku, Przychodnia Medycyny Morskiej, Tropikalnej i Chorob Zawodowych.* ul. Powstania Styczniowego 9B, 81-519 Gdynia, POLAND. Contact Person: Dr. Elzbieta Rosik. Phone: +48 58 699 85 90. Fax: 58 699 84 50. E-mail: przychodnia@acmmit.gdynia.pl

St. Petersburg, Russia

- *Briese Swallow St. Petersburg.* Vereyskaya Street, 6, St. Petersburg, RUSSIA. Contact Person: Chief Executive Pavel Fedulov. Phone: +7 812 3368003/4, Fax: +7 812 7020842, E-mail: admin@swallow.spb.ru
- *North-Western regional Medical Centre of Ministry of Health of the Russian Federation.* Tsialkovskiy street 3, St. Petersburg, RUSSIA. Contact Person: Evgeniy Presnyakov. Phone: +7 812 2516067, Fax: +7 812 2519700, E-mail: plavsostav@mail.ru

PEME Program Success

Safety at sea is the primary concern of every responsible person involved in the shipping industry and this issue of 'Currents' examines this theme from several important viewpoints. Closely allied to the safety of seafarers is their health and wellbeing. It is gratifying to record that in the second year of the American Club's Pre-Employment Medical Examination (PEME) Program a total of 5,855 seafarers (4,051 Ukrainian/1,804 Filipino) were examined between April 1, 2005 and March 31, 2006, before entering employment on Members' vessels. A total of 365 seafarers were found unfit for duty, of whom 74 were found to be permanently unfit. It is estimated that the scheme will have saved the Club and its Members a little over $2 million in crew exposures during this period – $4.25 million in total cost savings since the Program commenced in 2004.

Members are reminded that the Program is mandatory for seafarers employed from the Ukraine and Philippines and should ensure that manning agents are properly informed, so that all seafarers are provided with the proper American Club PEME forms applicable to clinics in the Ukraine or Philippines.

From September 1, 2006, the PEME Program will be expanded into the following locations: Riga, Latvia; Gdynia, Poland; St. Petersburg, Russia. It will become mandatory, from this date, for Members who employ seafarers from these countries, to use the clinics detailed opposite. Within the next month, the Club will authorize additional clinics in Novorossiysk, Russia; Bucharest and Constanza, Romania. Members will be notified as soon as the relevant agreements are finalized.

For further information, please contact Dr. William Moore, Vice President, Loss Prevention and Risk Control for the Shipowners Claims Bureau at +1 212 847 4542 or wmoore@american-club.net

THE AMERICAN CLUB

American Steamship Owners Mutual
Protection & Indemnity Association, Inc.,
Shipowners Claims Bureau Inc., Manager
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SAFETY AT SEA

Denise McCafferty, Manager of the Risk and Human Factors Group at the American Bureau of Shipping, highlights the application of Human Factors Engineering to the design of ships and maritime structures

THE PROBLEM

Over the past thirty years, increased discussion and attention has been given in the shipping industry to the role of the human element as the cause of, or contributor to, accidents and incidents with ships. In 1976, the National Academy of Sciences published a report, *Human Error in Merchant Marine Safety,*[1] that identified 14 human factors deemed to be the likely root cause of marine accidents. Over a decade later, a study performed by the University of California at Berkeley[2] found that 80% of all offshore accidents in U.S. waters were due to human error. In 1995, the U.S. Coast Guard launched a major initiative, called Prevention-Through-People (PTP), to reduce human error as a causative factor in maritime accidents, after its research[3] found that 75-96% of all accidents at sea were due to human error. Since 1995, almost every facet of the maritime industry has seen numerous studies published confirming what those who served on ships already knew, i.e. that inappropriate human actions are the greatest cause of, or contributor to, maritime incidents and accidents. The good news, however, is that this need not be the case if as much attention is paid to maximizing human performance on a ship as is given to maximizing hardware and software performance.

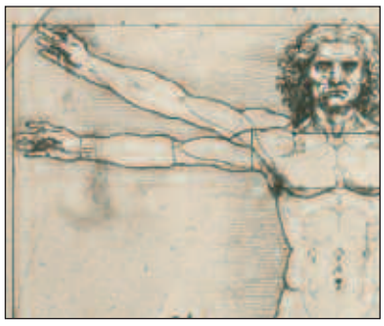
THE SOLUTION: HUMAN AND ORGANIZATIONAL FACTORS (HOF)

Over the past 75 years, a significant amount of research has been conducted to identify factors which shape and influence human behavior and performance in a work environment. These factors include such diverse issues as how the work place is designed, how employees are selected for particular jobs, how job aids, such as operational or maintenance manuals or procedures, are written and/or illustrated, how company policies and practices are presented to the workers, what elements of the working environment influence worker performance, how day-to-day changes in a person's life may affect how safely he/she works, how a human being's physical and mental capabilities and limitations influence their work efficiency and safety, what is the best way to train a human being for a particular job or skill.

This plethora of information on human behavior and performance in a work setting has become known in recent years as Human and Organizational Factors (HOF), and its application to the design and operation of maritime systems and equipment has introduced an engineering profession called Human Factors Engineering (HFE) to the shipping world.

HUMAN FACTORS ENGINEERING (HFE)

HFE is a specialized engineering discipline dedicated to acquiring and applying information about human capabilities and limitations in the social, psychological, and physiological arenas (i.e. HOF) to enhance human performance, safety and quality of life in all aspects of human existence, including the workplace. The HFE profession is not new, tracing its roots back to the industrial revolution. However, on-shore utilization of HOF in the United States really began with the use of HFE professionals to improve military hardware design and training techniques beginning in the early 1940s. Since then, the use of HOF, and the development of the HFE profession, by shore-based industries, has increased significantly. Success stories from the meat packing, nuclear power, processing, manufacturing, aerospace, transportation and military industries show clearly HFE can reduce human error and increase employee efficiency and can achieve these goals in a cost-effective manner.[4]



However, the commercial shipping industry has yet to actively adopt the HOF concept or seek HFE professionals to assist in the design of ships, establish corporate policies, help select vessel crews, create and conduct behavioral – based training programs or prepare operating or maintenance procedures. This, in spite of the fact that navies and, more

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recently, offshore oil exploration and production companies worldwide, now incorporate HOF and use HFE specialists, in the design and operation of their ships, oil rigs and production platforms.

There are signs, however, that this lack of utilization of HOF and HFE professionals in the shipping industry is changing. As an example, classification societies, such as the American Bureau of Shipping (ABS), are now preparing ergonomically-based design standards for ships. Furthermore, there are several ergonomic design standards produced by technical organizations, specifically designated for the design of ships and maritime structures. The American Society of Testing and Materials (ASTM) first published "Standard Practice for Human Engineering Designs for Marine Systems, Equipment, and Facilities" (F1166) in 1988. It is now undergoing a major revision to include the latest HFE technical data. This standard is now used by the U.S. Navy in the design of its vessels and by numerous offshore exploration companies in the design of offshore structures located around the world.

The IMO has issued several Resolutions and Circulars calling for use of Human Engineering in the design of ships. As an example, IMO MSC/Circular 834 (January 9, 1998) specifically calls for the design and arrangement of engine rooms per a recognized human engineering standard (which the ASTM F1166 and ABS "Guidance Notes for the Application of Ergonomics to Marine Systems" April 2003 has become).

In the offshore world, many of the major companies have now established their own in-house HFE design standards, which are integrated into all new platform and rig design contracts. And P&I Clubs (such as the American Club) have utilized HFE professionals for such activities as the conduct of HFE audits of high-risk vessels.

WHY INCORPORATE HOF INTO COMPANY OPERATIONS AND SHIP DESIGN?

There are many reasons for incorporating HOF into company operations and ship design but the bottom line is that it can save a shipping company money. It can reduce employee injuries and fatalities and ship accidents. It can assist in the reduction of ship manning and reduce the workload and fatigue of the crew. It can help companies defend themselves in cases of litigation and it can enhance crew morale and performance efficiency. Can it do this without costing a company any money? No. But it can do this in a cost-effective manner. As an example, the cost of integrating HOF into past new ship design and construction projects has ranged from 0.06% to 0.12% of the acquisition cost of the ship, depending on how much HOF was incorporated. The cost of a single employee's serious injury or fatality, or ship accident of any consequence, could far exceed the cost of the total HOF program.

Although incorporation of HOF into the design and operation of a commercial ship or offshore structure has yet to reach universal acceptance, there have been enough new ship and offshore structures designed and constructed utilizing HOF to demonstrate its worth, its feasibility and its economical practicability for use in the commercial maritime industry.

1 National Academy of Engineering. Human Error in Merchant Marine Safety. Maritime Transportation Research Board, Washington, D.C. (1976)

2 Bea, R.G., Moore, W.H. Operational reliability and marine systems. In New Challenges to Understanding Organizations. K.H. Roberts (ed.). Macmillan: New York, NY. (1993)

3 United States Coast Guard. Quarterly Action Team Report on Prevention Through People. Department of Transportation, Washington, D.C. (1995)

4 Hendrick, H. Good Ergonomics is Good Economics, The Human Factors & Ergonomics Society, Santa Monica, CA.

HELPING SURVEYORS TO SURVEY

The application of ergonomics to permanent Means of Access is discussed by leading Human Factors Engineering authority Gerry Miller

Introduction

The maritime industry has long recognized that a primary means of ensuring that the condition of a vessel's structure is maintained within applicable requirements is for the vessel to be surveyed/inspected on a regular basis throughout its operational life. This enables overall and close-up inspection activities to help ensure that the vessel is free from damage such as cracks, buckling, corrosion, overloading and that material thickness is within established limits. For surveys/inspections to be carried out effectively, suitable Means of Access to the vessel's structure is required.

Recognizing this need, a variety of documents have been published by a number of organizations to provide the industry with requirements and guidance for providing 'Permanent Means of Access'. These organizations have included the International Maritime Organization, the International Association of Classification Societies and various classification societies, including the American Bureau of Shipping (ABS).

IMO Requirements

To address the issue of suitable access, the IMO's Maritime Safety Committee (MSC) adopted the following resolutions into SOLAS Regulation II-1/3-6 – Access to and within spaces in the cargo area of oil tankers and bulk carriers:

- MSC.151(78) - Adoption of Amendments to the International Convention for the Safety Of Life At Sea, 1974, and
- MSC.158(78) - Adoption of Amendments to the Technical Provisions for Means of Access for Inspections.

Requirements and Guidance

The Means of Access requirements in SOLAS and guidance in the IACS UI SC 191 and ABS Guide for Means of Access to Tanks and Hold for Inspection apply to:

- Oil tankers of 500 gross tonnage constructed on or after 1 January 2006. This regulation is only applicable to oil tankers having integral tanks for carriage of oil in bulk, which is contained in the definition of oil in Annex 1 of MARPOL 73/78. Independent oil tanks can be excluded.
- Bulk carriers (as defined in SOLAS regulation IX/1) of 20,000 gross tonnage and over, constructed on or after 1 January 2006. SOLAS Regulation IX/1 defines a bulk carrier as a ship which is constructed generally with a single deck, top-side tanks and hopper side tanks in cargo spaces, and is intended primarily to carry dry cargo in bulk, and includes such types as ore carriers and combination carriers.

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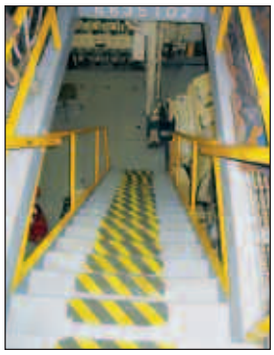
Means of Access Guidance

To assist in the implementation of these new requirements, IACS has developed Unified Interpretations (UI) SC 191 for the application of amended SOLAS regulation II-1/3-6 (resolution MSC.151 (78)) and revised technical provisions for Means of Access for inspections (resolution MSC.158 (78)).

In support of the IMO requirements and the IACS (UI) SC 191, ABS has prepared the Guide for Means of Access to Tanks and Holds for Inspection. This Guide provides additional information, via text and graphics, about the Means of Access requirements' interpretation and application. This Guide presents two levels of Means of Access guidance:

- The first level provides the base criteria to meet the IMO requirements.
- The second – and preferred – level of guidance incorporates the application of ergonomics to the Means of Access requirements.

The ABS Guide offers a voluntary notation related to the enhanced level of Means of Access guidance called PMA+. The PMA+ notation applies ergonomics principles to the design and arrangement of the Permanent Means of Access, where allowable. These instances include those areas where the Means of Access requirements have prescribed minimums and/or maximums and a preferred ergonomic dimension exists within the allowable range or where no specific dimensioning is provided.



Permanent Means of Access

Permanent Means of Access to spaces that require survey and inspection are commonly comprised of walkways, work platforms, ramps, vertical and/or inclined ladders and hatches. Each of these forms of access is unique in their design, construction, and arrangement, including the potential hazards associated with their use. Some of these hazards include injury due to falling over guardrails, falling off walkways or ladders, stepping into or falling through a deck opening, climbing on ladders that are damaged or slippery, or striking one's head against overhead obstacles or surfaces. Each of these potential hazards is safety and/or ergonomics-related.

The IMO Means of Access requirements address many of these potential hazards from a safety standpoint, but not

as effectively from an ergonomics perspective. The ABS Guide for Means of Access to Tanks and Holds for Inspection identifies those areas where the IMO Means of Access requirements can be enhanced through the application of ergonomics practices and principles.

It should be noted that many of the dimensional aspects of the Means of Access requirements are stated in a manner that provides the designer with design latitude with respect to dimensioning. These instances include those areas where the IMO Means of Access requirements have prescribed minimums, maximums or where no specific dimensioning is provided. Examples include:

- *"Stanchions shall be not more than 3m apart" – this establishes a maximum distance only. A shorter dimension is allowed.*
- *"Permanent inclined ladders shall be inclined at an angle of less than 70 degrees" – which means that inclined ladders cannot exceed 70 degrees.*
- *"Inclined ladders shall be provided with handrails of substantial construction on both sides fitted at a convenient distance above the treads" – here, no specific handrail height is stated.*

However, there are instances where the dimensional aspects of the Means of Access requirements are specific. For example: *"Guard rails shall be 1,000mm in height"* – the dimension here is specific, no other dimensions are allowed.

Generally, for many of the IMO Means of Access requirements, a preferred ergonomic dimension is provided.

Means of Access Requirements

Summary of IMO Means of Access Requirements

The IMO Means of Access requirements are presented in MSC.158(78). These requirements are contained in several extensive and complex tables. The design and arrangement of these tables do not allow for the straightforward identification of applicable requirements. As a result, the ABS Guide summarized these requirements to allow for the quick and easy identification of appropriate Means of Access requirements.

To further simplify the use of these tables, the numbering scheme used in the MSC tables has been preserved. For example, in the following table, Table 1 "Application of Resolution MSC.158 (78) (Oil Tankers)", in the Underdeck Structure row, tanks/holds with a height of 6 meters or more are required to meet MSC.158(78) Table 1 requirements of 1.1.1, 1.1.2, and 1.1.3.

Table 1, Application of Resolution MSC.158(78) Table 1 for Oil Tankers*

Cargo Tanks or Holds	Tank/Hold Height ≥ 6m	Tank/Hold Height < 6m	
Underdeck Structure	1/1.1.1, 1/1.1.2, 1/1.1.3	1/1.2	
Longitudinal Bulkhead	1/1.1.4 or 1/1.1.6+		
Cross Tie (≥ 6m above tank bottom)	1/1.1.5		
Ballast Tank and Double Side Skin Space	Tank/Space Width ≥ 5m	Tank/Space Width < 5m	
		Height ≥ 6m	Height < 6m
Wall-sided Mid-Depth Portion (Between Topside and Hopper Portions)	1/1.1.4 or 1/1.1.6+ 1/1.1.5	1/2.1	Not Applicable
Upper Topside Tank			
Lower Hopper Portion/TankLower		1/2.2	1/2.3
Hopper Portion/Tank	1/1.3	1/1.3	

* = Numbers in this table correspond to MSC.158 (78) Table 1, "Means of Access for Ballast/Cargo Tanks of Oil Tankers".
+ = If Height < 17m.

Specific Means of Access Requirements

The specific Means of Access requirements for each of the tables mentioned above are presented in its entirety along with the IACS unified interpretation, and any **PMA+** ergonomics guidance. The ABS Guide also provides graphical representations for some of the Means of Access requirements to help clarify or demonstrate the requirement's intent. Also, additional guidance related to the design of the Means of Access is provided, where appropriate. Table 2, "MSC Requirement 1.1.1 (Tank Heights ≥ 6m and Containing Internal Structures)", shows an example of the MSC, IACS, and **PMA+** requirements. Figure 1, "Access on Stiffened Side of an Underdeck Structure for Tanks ≥ 6 Meters in Height", provides a graphic illustration of the Means of Access requirement.

Table 2, MSC Requirement 1.1.1 (Tank Heights > 6m and Containing Internal Structures)

Means of Access Requirements for 1.1.1 from MSC.158(78) Table 1 for Oil Tankers			
Means of Access Requirement	Continuous athwartship permanent access arranged at each transverse bulkhead on the stiffened surface, at a minimum of 1.6 m to a maximum of 3 m below the deck head		
	Dimension		*IMO Requirement*
	"A" In figure below	Overhead clearance	≥1600 mm (63 in.) and ≤3 m (9.75 ft.)
IACS Interpretation	The vertical distance below the overhead structure is to be measured from the underside of the main deck plating to the top of the platform of the Means of Access at a given location.		
PMA+ Requirement	*Dimension*		*PMA+ Requirement*
	"B" In figure below	Overhead clearance	≥1980 mm (78.0 in.) and ≤3 m (9.75 ft)
Additional Guidance	Overhead clearance from a **PMA+** perspective shall be measured from the top of the walking platform/surface to the lowest structure directly above the walkway. Detailed overhead clearance guidance is available in Section **3, "Walkways, Ramps, and Work Platforms", Subsection 2,** "Walkways and Ramps".		

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Additional Guidance

Additional guidance is provided for many of the Means of Access requirements. For example, from Table 2, "MSC Requirement 1.1.1 (Tank Heights > 6m and Containing Internal Structures)" two types of additional are provided in the ABS Guide. One type is descriptive in nature to further explain the requirement's intent and the other is the location within the ABS Guide to find more detailed guidance related to this topic. An example of more detailed guidance is contained in Figure 2, "Walkway and Ramp Design". This guidance includes the design attribute (application) and the IMO and **PMA+** dimension requirements.

Figure 1, Access on Stiffened Side of an Underdeck Structure for Tanks ? 6 Meters in Height

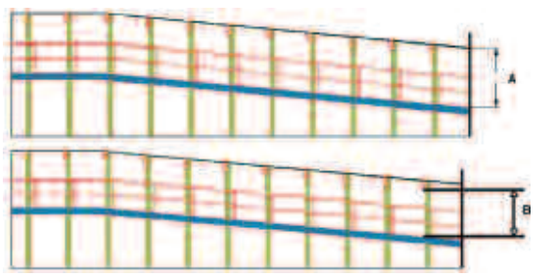
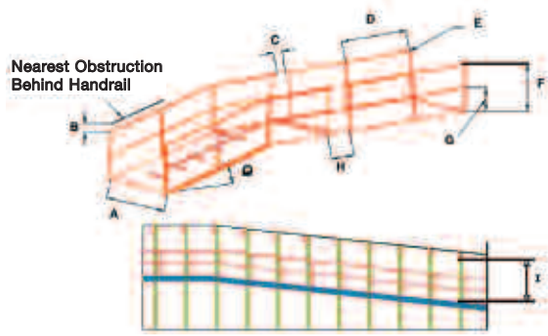


Figure 2, Walkway and Ramp Design

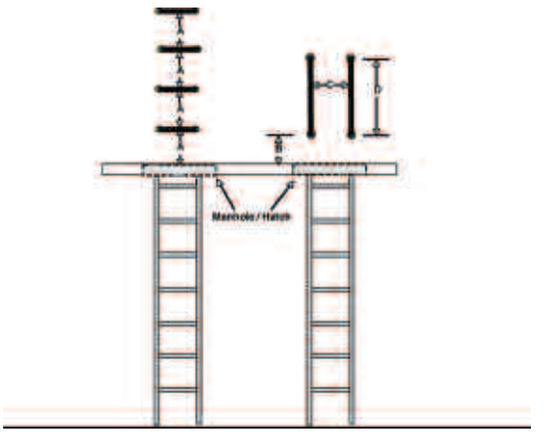


	Dimension	*IMO Requirement*	***PMA+** Requirement*
A	*Walkway width*	*≥600 mm (23.5 in.)*	*No additional requirement*
	Walkway width around a web frame (See Figure 3 "Webframe Walkway")	*≥450 mm (18.0 in.)*	*≥510 mm (20.0 in.)*
B	*Distance between handrail and any obstruction*	*No Requirement*	*≥75 mm (3.0 in.)*
C	*Gaps between two handrail sections*	*≤50 mm (2.0 in.)*	*No gaps allowed*
D	*Span between to handrail stanchions*	*≤2.9 m (9.5 ft.)*	*≤2.4 m (7.9 ft.)*
E	*Diameter of handrail*	*No Requirement*	*40 mm (1.5 in.) Minimum 50 mm (2.0 in.) Maximum*
F	*Height of handrail (measured to the top of the handrail)*	*1000 mm (39.0 in.)*	*No additional requirement*
G	*Height of intermediate rail (measured from the bottom of the intermediate rail to the walking surface)*	*500 mm (19.5 in.)*	*No additional requirement*
H	*Maximum distance between the adjacent stanchions across handrail gaps*	*≥350 mm (14.0 in.)*	*No gaps allowed*
I	*Walkway overhead clearance (measured from the walking surface to the underside of the lowest obstruction over the walkway)*	*≥61.6 m (63 in.) and ≤≥3 m (9.75 ft.)*	*≥1980 mm (78.0 in.) and ≤3 m (9.75 ft)*
O	*Ramp angle of inclination*	*≥5 degrees*	*≥5 degrees and ≤15 degrees*

Supplementary Ergonomics Guidance

The IMO and IACS guidance on Means of Access is not comprehensive. There are many more instances where ergonomics can be applied to enhance the safety of workers. The ABS Guide offers supplementary guidance in different areas related to Means of Access not covered by IMO or IACS. This includes, but is not limited to, guidance for the design and placement of toeboards, design loads guidance for guardrails, walkways, work platforms, inclined/vertical ladders, and handle design and placement. Figure 3, "Handle Placement (Ladder not Extending Through Platform)", shows an example of this type guidance.

Figure 3, Handle Placement (Ladder not Extending Through Platform)+



	Dimension	*IMO Requirement*	***PMA+** Requirement*
Four Horizontal Handles			
A	Handle height above top of ladder	No Requirement	≥230 mm (9 in.) ≤≤280 mm (11 in.)
Two Vertical Handles			
B	Height from top deck to handle	No Requirement	203 mm (8 in.)
C	Clearance between handles	No Requirement	430 mm (17 in.)
D	Height of handles	No Requirement	1020 mm (40 in.)

+ = Other vertical ladder measurements apply

Additional Items Covered in the ABS Guide

Alternative / Temporary Means of Access

IMO states that, under certain conditions, "alternative Means of Access, as defined in paragraph 3.9 of the Technical provisions, or portable means may be utilized in lieu of the permanent Means of Access." To assist designers, the ABS Guide contains guidance for the design of alternative Means of Access. There are no specific PMA+ criteria, but what is provided is general and detailed design guidance.

Alternative Materials

IMO allows for the use of equivalent or alternative materials for the construction of the Means of Access for inspection. For example "Ladders and handrails shall be constructed of steel or equivalent material of adequate strength and stiffness and securely attached to the structure by stays." The ABS Guide describes the required data that needs to be submitted to ABS as well as the process to obtain approval. The purpose of the alternative materials process is to ensure that the materials selected for Means of Access structures are suitable for the intended service, including construction and repair.

Conclusion

The application of ergonomics to the Means of Access requirements can improve overall personnel performance and safety, while reducing the potential for human error. This Guide, used in conjunction with the ABS Guidance Notes for the Application of Ergonomics to Marine Systems, will further promote the application and understanding of ergonomics principles to vessel designs. The ABS Guidance Notes for the Application of Ergonomics to Marine Systems addresses design and layout considerations for human-system interfaces at the individual task and workstation levels. This includes physical and perceptual issues for the design of the personnel interface with controls, displays, alarms, VDUs, labeling, workspace access and workspace arrangement.

Safety As A Competitive Edge

Dr Torkel Soma, Head of Safety Excellence at DNV Maritime Solutions and author of 'Blue-Chip or Sub-Standard?', analyzes the advantages of incorporating a safety culture into shipping.

Major shipowning companies today have safety excellence on their agenda as a competitive resource. Three years of studying thousand of ships and 9 shipowners in detail have demonstrated that the top 25% are 7 times better then the 25% worse in terms of accident statistics and 3 times better than the average. If you are an average-performing shipowner, you have the potential to reduce accident frequency by 70% and to reduce costs significantly. Safety can be a competitive factor in the market because the cargo owner wants to be sure of service levels and has zero tolerance for accidents and long delays.

The key building blocks for achieving safety excellence and becoming a blue-chip ship operator are:

- Control of organizational changes
- Management of communication
- Monitoring of onboard culture
- Clear definition of organizational parameters

Safety Excellence – You cannot expect a good reputation if you do not have control

Shipping is a competitive market but quality ship management itself is not considered, in practice, to be a competitive resource. Experience of ship management successes and failures are shared relatively freely between evenly competing companies. However, over the past few years, several blue-chip shipping companies have realized that even though ship management practices are not a unique competitive resource, the reputation they obtain is an important one. As a result, safety excellence has been put on the agenda of their CEOs and boards of directors. What most soon realize is that shipboard human resources have been a neglected area of control for too long. Cost-cutting, out-sourcing, reorganization and extensive new impositions have been initiated without sufficient support from the management or feedback on the effects upon shipboard operations. It is not a surprise that more than 80% of accidents involve the human element.

Ship-shore communication – You cannot control what is not manageable

A typical organizational culture in shipping is characterized by quick decisions in buying and selling, short-term solutions, emphasis on technology, tonnage and time-schedules, to the detriment of people and human values. As a result, there are many ships sailing with crews that consider safety to be nothing more than a hassle of compliance and paperwork demanded without any genuine commitment from the top-level management.

How can this lack of trust be turned around? First, the management has to listen to how they are doing onboard the vessels. Secondly, they need to demonstrate that they have listened and are willing to take action to improve the situation.

To listen is, however, not straightforward. As a manager, you cannot simply sit down and expect to receive valid feedback, even on crucial operational aspects. A crew member is typically employed by an external manning agency, is located on the other side of the world, has never visited the head office, does not know the managers, has a different culture, speaks a foreign language, has received minimal feedback on earlier requests and assumes that his contract is at risk if he raises his voice. In cases where he feels free to speak up – during, for instance, officer seminars – it is interesting, from an outside perspective, to see how shore management handle the situation. And they often find it difficult to confront dissatisfaction – in which case, it may be wiser to use independent intermediaries to assure the quality of the feedback.

Safety performance – You cannot manage what is not measurable

There are several challenges for ship management when it comes to measuring safety performance. First of all, the monitoring of incident statistics such as insurance claims and lost-time incidents cannot be reliable because they occur too infrequently in a company fleet. A similar argument can be used for inspection deficiencies and audits. They offer some contribution but a distorted one, when measuring the influence of the human element.

The second challenge is that the 'the devil is in the detail'. It extremely difficult to identify core organizational weaknesses through incident investigation alone. Crew fatigue, for instance, is a factor that can be managed relatively easily when identified as a weakness. In practice, however, it is not fair to assume that any internal investigation (TMSA stage 4 or not), can conclude that an accident was caused by crew fatigue. It can take months of research and analysis of extensive data to prove that crew fatigue is a general influence behind navigational accidents. Even the inquiries into the space shuttle disasters *Challenger* and *Columbia* had difficulties in proving that the accidents would not have occurred if the leadership and culture had been different. Shipping companies do not have the resources to undertake similar studies of incidents, in order to reach the desired level of detail. Therefore, safety performance has to be measured through alternative approaches, such as interviews or questionnaires.

The third challenge refers to how a shipping company can prioritize the work of assessing the safety culture onboard their vessels. Typically, this is initiated by an incident revealing that e.g. onboard leadership can be improved.

Some more advanced companies have developed their own surveys, based on questionnaires and interviews,

to ensure they take a broader view. What both approaches ignore is that neither has a proper reference. Is poor onboard leadership the top priority? Or is it satisfactory, if the score on a questionnaire is 4, on a scale from 1 to 5? Without a proper reference, both approaches can be a wild–goose chase.

Safety attitudes – You cannot measure what is not defined

Human and organizational factors are often referred to as 'soft' elements. There is, however, no 'softness' about the serious losses which negligence of these elements can cause, nor about the science it is built upon. This can be illustrated by considering the 'softest' of all human and organizational factors – safety attitudes. Many emergency situations escalate due to errors and the refusal to take decisions under stressful and unclear circumstances. The results can be million-dollar losses, fatalities and environmental damage. Therefore, as a manager, you should be familiar with attitudes onboard and ask the crew if they agree with the following two simple statements:

1. My decision-making ability is as good in emergencies as in routine conditions.
2. I am more likely to make errors in an emergency.

You would expect that those not agreeing with the first question would agree more readily with the second question – but you would be wrong. The two statements measure two independent attitudes. The first measures attitudes influenced by national culture, the second measures attitudes influenced by organizational culture.

(continued on next page)

As an example, Filipino crew answer the first question the same, irrespective of their safety attitudes, while all crew answer the second question the same because they are part of the same organizational culture. How do we know that? Because responses have been tested and analyzed for decades, relying on hard data and advanced scientific techniques. In other words, defining how safety attitudes should be measured, is a professional task.

The key starting-point

There is no simple fix that can make a shipping company excel in safety overnight. However, there are some simple ways to start:

As a starting-point for improvement, DNV Maritime Solutions use a semi-standardized questionnaire for shipping companies worldwide, issued to all crew on all ships. The survey itself is administered and analyzed by DNV so that crew may be reassured that they can respond freely, without any negative effect upon their careers. The results are treated as confidential and the results are presented to the company in an anonymous format.

The core of the questionnaire has been adapted from the airline industry, through a joint project between Risø National Laboratory, the Danish Maritime Institute and the University of Texas conducted in 1996. The current version of the questionnaire covers a section tailored to the company's own needs, a standardized section and a free text field. The responses to the standardized questions can be compared to the responses of similar anonymous companies extracted from the client database. Currently, there are more than 15 shipping companies in the database, covering mostly tanker and bulk carrier companies. Based on this comparison, or benchmark, it is possible to say whether a score of 4, on a scale of 1 to 5, is high or not. The free text section is also important as basic problems are not covered by the standardized questions.

The questionnaire covers a range of valid factors, in the form of questions or statements. These factors are:

- Teamwork and cooperation
- Procedures
- Compliance
- Operational atmosphere
- Job satisfaction
- Safety practices
- Power & dignity
- Work integrity
- Communication
- Stress awareness
- Fatigue awareness

The next steps

When feedback on shipboard operations and safety attitudes has been analyzed, it is crucial that crews see that suitable action is taken. In some cases, the problems might have been identified at the start by competent shore managers. But that does not mean that the survey was unnecessary. To create the right climate and culture, people need to be involved, to be heard and to take part, in order to drive forward the subsequent improvement process.

Thus, in order to achieve Safety Excellence, there have to be onboard ambassadors willing to promote the improvements identified by the questionnaire's findings. If everything is right from the start, it is far easier to proceed with the next steps. A further survey can then be implemented, to ensure that the measures are effective and, over time, this will have an effect upon safety excellence, reputation and market success.

NEW LOSS PREVENTION POSTERS

The American Club has issued a new round of loss prevention posters, to follow the success of the first set of posters and comic book pamphlets, *Preventing Fatigue* and *Shipboard Safety.* These new posters focus on issues relevant to maritime security, oily water discharge, safety alertness and the dangers of enclosed spaces.

Maritime security matters have dominated the industry since the terrorist attacks of September 2001 and the Club's posters focuses on the need to be alert. However, it is common knowledge that piracy and armed robbery are also problematic in particular parts of the world, as well as stowaways, and that the posters should address those security concerns.

Many port and coastal State jurisdictions are becoming increasingly stringent about the discharge of oily water, in violation of annex I of MARPOL 73/78. Consequently, the Club wishes to remind Members that the discharge of oily water in many jurisdictions is a crime and that all efforts should be made to comply with the international requirements.

The Club has also produced a poster reminding seafarers to be alert at all times and in all locations, including on deck, in the engine room and in common living spaces. This poster is accompanied by a specific poster on the dangers of enclosed spaces, and the safety procedures and proper equipment to be utilized to prevent accidents.

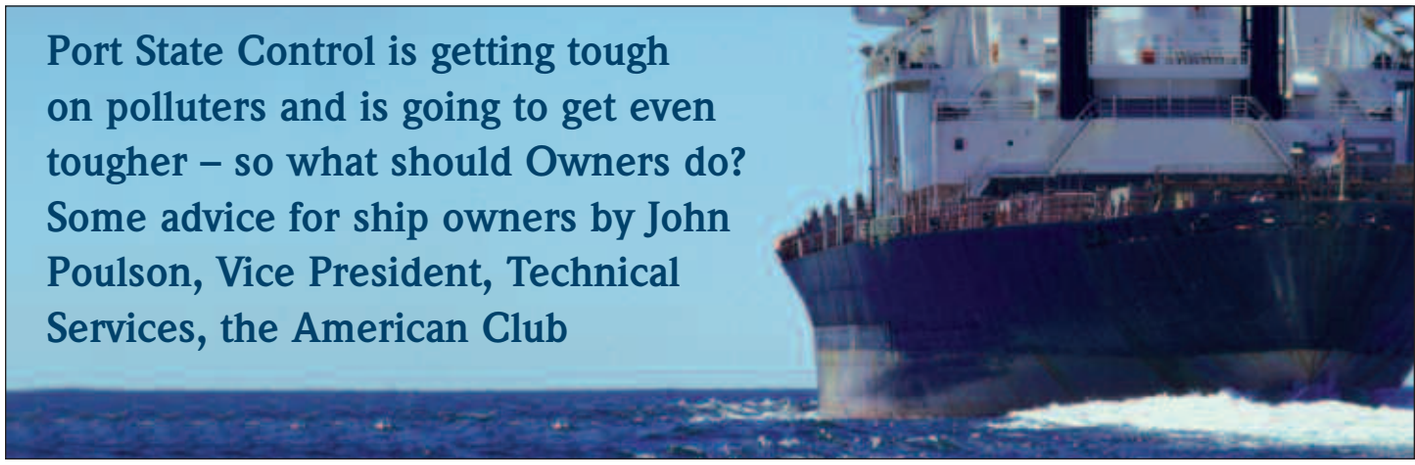
The first set of posters addressed lifeboat safety, slips, trips and falls prevention, proper lifting to prevent back injuries and prevention of fatigue. As with the first set of posters and the comic book pamphlets, the artwork has been done by Mr John Steventon of Parsippany, New Jersey.

Club members will receive a sufficient number of posters for distribution to all entered vessels. In addition, the Club has produced smaller versions of the posters for Members operating vessels where wall space for displaying posters is at a premium (e.g. tug and barge vessels).

For further information, please contact Dr. William Moore, Vice President of Loss Prevention, Risk Control & Technical Services at Shipowners Claims Bureau, Inc.: Tel: +1 212 847 4542 or wmoore@american-club.net.

BILGE WATER DISCHARGE-STILL HAZY AFTER ALL THESE YEARS?

Port State Control is getting tough on polluters and is going to get even tougher – so what should Owners do? Some advice for ship owners by John Poulson, Vice President, Technical Services, the American Club



Ship owners, operators and managers are aware – now more than ever – that pursuant to 'Marpol Annex 1' (oil pollution) regulations, Port State Control (PSC) on behalf of international governments is exhibiting less and less tolerance of those that disregard the environmental effects of discharging oil or oily residues into the harbours and oceans of the world.

Authorities worldwide are now following the example set by the United States in actively pursuing criminal acts of pollution with a zero tolerance policy wherever and however these acts may have occurred – triggers for prosecution that, apparently, can sometimes still surprise the Owner.

If a vessel is found to have defective equipment or inconsistent documentation upon presentation to the authorities in a U.S. port, then the use of that equipment or the procedure on board can be deemed to have been illegal, wherever and whenever it took place – and not necessarily in territorial waters. Should the Oily Water Separator (OWS) show signs of malfunction, or the Oil Record Book (ORB) entries not be consistent with log book entries, soundings or fuel records, or should the inspecting PSC Officer have any doubts that 'things are not as they should be', a report will be filed and prosecution may follow.

Recent directives to PSC Officers include in-depth advice on what to look for on board and what tests may be carried out. Testing directives now include the disconnection of discharge pipework in order to perform a full operational test, by allowing the flow-through of oily water mixture and observing the operation of the oil/water interface sensors, oil recirculating valve and the 15ppm alarm systems.

One would think, given the attention that the issue is attracting – and the fact that malpractice can bring about criminal prosecution pursued with an enthusiasm rarely associated with other aspects of ship operation – that the OWS and associated systems would be afforded lots of tender loving care – but is it the case? One would think that the little green monster in the corner would be the pampered little pet of every Chief Engineer at sea, given the implications of its being found sick during one of its random, compulsory check-ups. Club surveys, however, suggest that its use seems to be one of those 'cultural' aspects of shipboard operations that is sometimes deemed to be just a necessary evil and, instead, the equipment tends to be neglected in favor of more 'important' aspects of operations.

Perhaps it needs a few more multi-million dollar fines and jail sentences to be imposed before Owners everywhere finally get the message that the proper handling of oily waste on board is a major operational priority.

Feeling Neglected?

Several instances of the complete by-passing of OWS equipment, using temporary and sometimes elaborate piping systems, have been discovered. Owners need

to be acutely aware that everyone is wise to these measures now and when acquiring a pre-owned vessel, all lines must be checked to make sure that no evidence of previous transgressions exist. If they do and they are discovered, the new Owner will be deemed culpable. Owners also need to be acutely aware that P&I Clubs will not cover transgressions unless purely accidental. By-passing the OWS may be a short cut – but only to jail!

The equipment on board will have met, at some stage, with the approval of the regulatory bodies concerned. Nevertheless, the design of some OWS in service today can be more than 30 years old. Whatever the vintage, they must be maintained at the highest possible level, if they are to pass the tests that may be imposed by Port State Control. Failure is failure - with no excuses, whatever the mode. The old adage 'failing to prepare is preparing to fail' could not be more apt than when applied to a vessel about to enter a U.S. port and to be subjected to scrutiny by PSC.

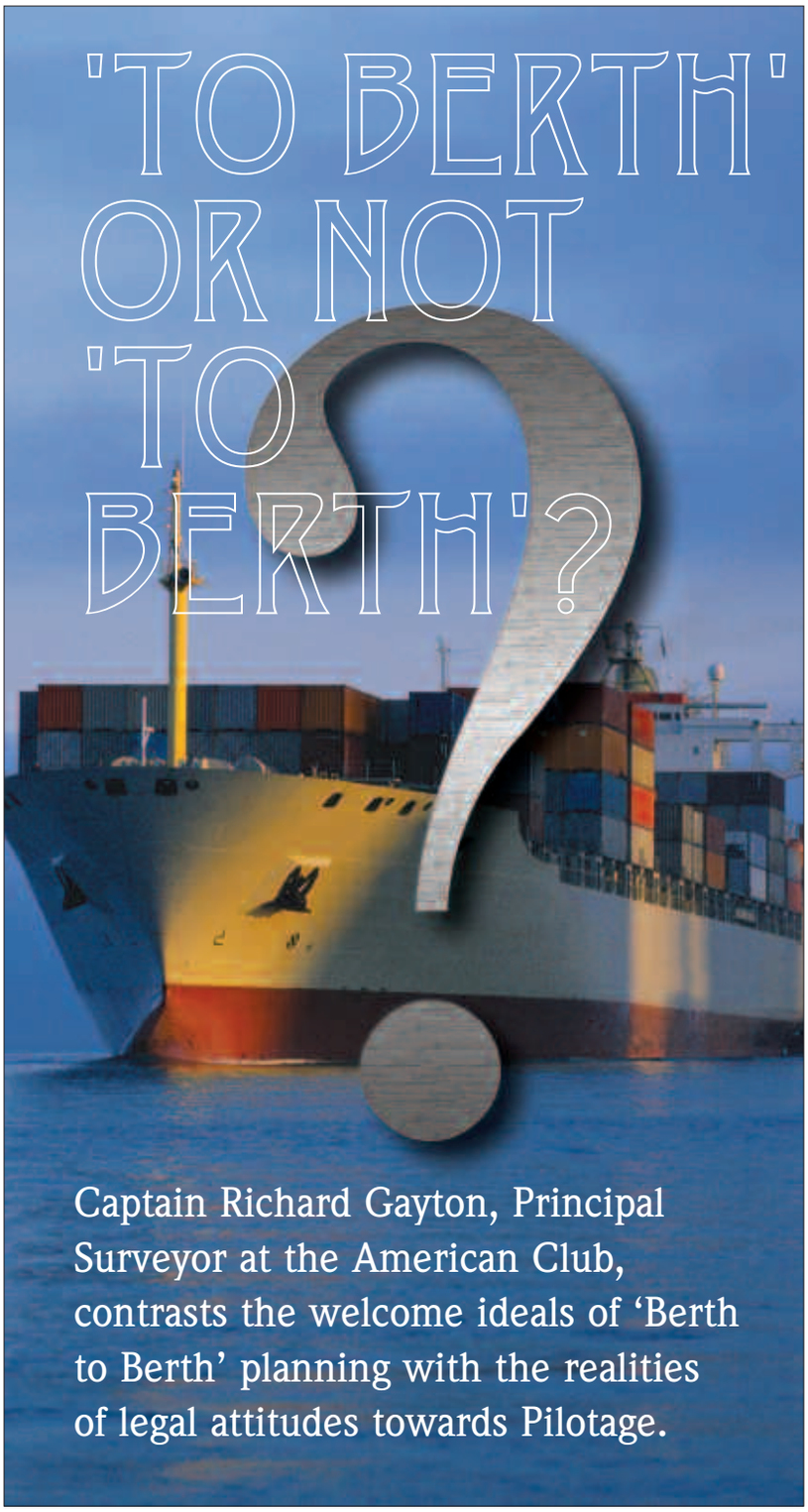
One significant problem encountered is limited storage capacity on board, particularly on older vessels. If holding tank capacity is found to be insufficient, consideration can be given to increasing capacity by the conversion of existing tanks or installation of additional tanks – with Class and Regulatory Body approval. If this is a recurring aspect of shipboard operation, it should be raised as a deficiency, as part of the Safety Management System.

New technology may be around the corner but, in the meantime, the following suggested general notes may help with successful, practical onboard oily waste management, environmental protection and PSC compliance, regardless of the actual specification of the equipment installed:-

- Machinery space bilges and other oily water mixtures should be transferred to the holding tank and allowed to settle, prior to passing through the OWS.
- Heavily contaminated mixtures, such as sludge tank contents etc, should not be passed through the separator; this should be incinerated or held for discharge ashore.
- Holding tank contents should be heated to allow separation/decanting of oil and water as much as possible.
- Oil/water leaks in the machinery spaces should be minimized.
- Purifier operations should be carefully managed and blow-down periods timed to avoid unnecessary filling of the sludge tank.
- Pumping rate through the OWS should be kept as low as possible – certainly no higher than the manufacturers' rated throughput to optimize efficiency. When the oily bilge holding tank has been lowered sufficiently, seawater should be pumped through the separator to allow time for oil still being circulated to be separated and removed.
- Although the system may be designed for automatic operation, the OWS should be monitored throughout, whenever in use.
- Sufficient spares - pump spares, filters, metre spares etc - should be kept on board and a clear commitment to maintenance of the equipment shown.
- All maintenance carried out on the OWS, associated pumps, filters, pipes, incinerator etc should be entered into both the logbook and the Oil Record Book.
- The separator should be opened for cleaning periodically and attention paid to the second-stage filters which should be changed as necessary.
- The 15ppm meter should be regularly cleaned and calibrated with clean sea water and adjusted strictly as recommended by the manufacturer.
- To ensure that the system is functioning correctly as a whole, a regular sub-audit of procedures should be made on board by the Master and Chief Engineer to confirm that the following interrelated parameters are correct:-
- OWS pump running hours as entered in the log book/ORB
- OWS pump running hours from the electric timer
- Rise or fall in tank soundings due to operation of bilge pumps or separator
- Incinerator fuel tank level and operating hours

This may all seem like a lot of work – but a safe mantra for the operation of ships' plant is "look after it – and it will look after you". Nowadays, this applies to the OWS and associated systems as much as anything else on board!

Further details of the USCG directives to PSC Officers can be found at: www.uscg.mil/hq/g-m/moc/docs.htm.



Captain Richard Gayton, Principal Surveyor at the American Club, contrasts the welcome ideals of 'Berth to Berth' planning with the realities of legal attitudes towards Pilotage.

Masters and navigating officers are well aware of the need for detailed passage plans to be completed, prior to the commencement of any voyage. These plans form a basic part of prudent seamanship and have been carried out for as long as anyone can remember.

Over the years, effective passage planning has been made the subject of ongoing discussions at an international level, resulting in regulations such as Section A-VIII Part 2 of STCW 95 code and the International Chamber of Shipping's 'The Bridge Procedures Guide'. These documents break effective passage planning down into four stages, namely, Appraisal, Planning, Execution and Monitoring. These are great resources to have on the bridge of any ship, even if they only put into writing what the old "salty" navigator already knows.

So what goes wrong when the vessel approaches port and the pilot climbs over the bulwark and becomes an important addition to the bridge team? Surely, the addition of this highly qualified individual with local knowledge should enhance the performance of any bridge team? It seems that this is not always the case, and the number of casualties that continue to take place within pilotage waters support this assertion.

A CONFLICT OF INTERESTS?

The Master is obviously aware of his legal relationship with this new member of the bridge team. One would have thought that this new fellow deserved to be watched very closely, since he has the singular power to destroy any master's career!

It would appear that this is not always the case and that this otherwise unknown person is generally considered to be some kind of Supreme Being and allowed to take full control of the vessel with little more said. The pilot issues a string of orders and the vessel continues happily on her way. It appears that he doesn't consider himself to be part of the bridge team at all!

In the meantime, our regulatory friends have been busily producing new resolutions such as IMO A.893 (21), *'Guidance Notes for Voyage Planning'*, which now include phrases like *"Berth to Berth"* passage plans. Surely, our prudent old "salt" has seen this coming and developed his detailed passage plan from *"Berth to Berth"*. In my experience, as a surveyor, it would again appear that this is not the case. On review of most vessels' passage plans, the port and harbor charts are usually found to contain no more than a few, hastily-scribbled course lines, which sometimes proudly display heading annotations! What has happened to our detailed passage plan – and is it really the Master's fault?

In reality, any plan – whether it be a passage plan or otherwise – is only effective if it is followed. So how is it possible for the Master to produce an effective passage plan in pilotage waters when he hasn't even met the pilot. Ah yes! Effective communication, isn't that a key component of any bridge team? After all, the Master is not a mind-reader and he can't produce an effective passage plan based on five minutes of chit-chat, after the pilot enters the bridge. So why, then, is there not a suitable pre-boarding exchange of information between the pilot and the Master? Surely this is possible! Suitably briefed, our Master and bridge team - now fully appraised of the pilot's intentions - can now happily complete the required passage plan.

Of course "Pre-boarding written information from the pilotage authority and documentation of pilots' intentions" is not a new subject. Back in 1994, the Transport Safety Board (TSB) of Canada made a study of the Master/Pilot relationship, resulting in Recommendation No. M94-34, December 1994, to the Department of Transport, recommending that the pilotage authorities publish official passage plans for compulsory pilotage waters and make them available to masters to facilitate monitoring of the pilot's actions by the vessel's bridge team.

"I thought you said right – No! I said light".

Our colleagues at the IMO, International Maritime Pilots Association (IMPA), INTERTANKO, International Chamber of Shipping (ICS) and various other organizations are also more than fully aware of this subject. I should even imagine that the IMO's Safety of Navigation (NAV) sub-committee would probably cringe at the very words! The NAV sub-committee has formed the actual battleground with the IMPA and other pilot interests, pitted against the various shipowner interests. So the battle has progressed with no real common ground being agreed. The final result, in my opinion, is an ineffective resolution in the form of IMO A.960 (23).

So what is the problem with a suitable "Pre-boarding written information exchange from the pilotage authority"? Can't it be done? The real problem is that the pilotage authorities and organizations involved are somewhat old-fashioned in nature, a little resistant to change and appear to be frightened of possible legal ramifications. Most of all, they don't want to see any erosion of the pilot's historically insuperable status.

One questions whether they are supporting the Master or shipowner's interests at all. They would seem at times to have forgotten that they are a "servant of the shipowner" – until things go wrong, that is, and then they cloak themselves with the legal definition of that role.

In the debate processes of the various NAV sub-committee meetings, the IMPA has referred to pre-boarding Master/Pilot written exchange as impractical, unsafe, rigid and of commercial interest only. However, on closer examination, these principal points seem to be less prevalent. Compulsory communications equipment now on board make these exchanges possible. Safety is exactly what is being improved and no passage plan is designed to be totally rigid – there will always be contingencies.

So where does this leave the Master? It would seem to be in a very awkward place indeed! He is expected to complete and monitor an effective passage plan from *"Berth to Berth"* but, realistically, can find it extremely difficult to obtain the necessary, timely, information to do so.

I'm telling you … there was a stop sign!"

So what can be done? No doubt pilotage unions would like to see Resolution A.893 (21) and other relevant publications revised to exclude references to *"Berth to Berth"* passage planning and to slide back into the "old" ways. While this may suit pilotage interests, it certainly would not suit shipowner insurance interests and would surely be a backwards step. My opinion is that pilotage authorities should be required to provide shipowners with passage plans for all compulsory pilotage areas. Perhaps it is already time to take another look at Resolution A.960 (23) – or, more importantly, the general legal relationship between the Master and pilot.

International Group Review
Ship Safety Initiative

The International Group of P&I Clubs has implemented the following measures as part of its initiative to address safety concerns about sub-standard shipping:

1. A condition survey database has been established to record surveys conducted by Clubs on entered vessels, which will be updated on a monthly basis. Clubs shall be required to provide the vessel's name, IMO and survey date, while retaining the survey report itself.

2. Condition surveys are to be undertaken for sea-going vessels aged 12 years or more on entry, except for non-tankers below 500 gt and non-pooled vessels. (The term 'sea-going' excludes vessels operating only within port limits and inland waterways).

Clubs shall have discretion to determine whether or not to undertake condition surveys on vessels aged less than 12 years on entry.

3. The carriage of Heavy Fuel Oil by vessels aged 10 years or more shall trigger a condition survey unless:

- the vessel had undergone a condition survey during the previous 12 months or
- the vessel had undergone a Special Survey during the previous 6 months or
- the vessel had achieved a CAP 1 or CAP 2 status.

Members shall be required to make a declaration at the 2006/07 renewal, in order to determine whether HFO had been carried during the previous 12 months, and to repeat the declaration an annual basis thereafter. Where a ship continues to carry HFO, a further inspection shall take place at least every 3 years after the first inspection. Heavy Fuel Oil is defined as 'a residual fuel with a kinematic viscosity of 380 centipoise or greater when measured at 50 degrees Celsius by Test Method ISO 3104'.

4. Underwriters shall be required to check the condition survey database before quoting terms for entry, to ask for sight of the relevant condition survey report and to take account of its findings in assessing the risk.

5. Underwriters shall be required to check the following Indicators of Quality before quoting terms for entry:

a) Indicators of Quality – New Members:

- general details of the vessel such as age, type, flag, any major conversion work etc
- date and place of build
- identity of current Classification Society, date of any changes in Class in the last three years, identity of previous Class and whether a change of Class is planned
- details of ISPS and ISM Certification
- identity of current managers and length of involvement, and details of any changes in management in the last three years
- area and type of trade of the vessel
- source of officers and crew, also their nationalities
- whether the vessel has undergone previous P&I condition surveys (and permission for the Club to divulge the findings of any future P&I condition survey to another P&I underwriter asked to quote on the vessel) (see above)
- details of whether P&I cover has ever been declined or terminated by an insurer or special terms or warranties imposed, and the reasons why
- claims record and PSC record, including details of any fines, prosecutions, banning orders or blacklisting
- opinions of third party agencies and other existing members

b) Indicators of Quality - Existing members with new acquisitions:

- general details of the vessel such as age, type, flag, any major conversion work etc
- date and place of build
- identity of current Classification Society, date of any changes in Class in the last three years, identity of previous Class and whether a change of Class is planned
- details of ISPS and ISM Certification
- identity of current managers and length of involve ment, and details of any changes in management in the last three years
- area and type of trade of the vessel in relation to the profile of the member's fleet
- source of officers and crew, also their nationalities
- whether the vessel has undergone previous P&I condition surveys (and permission for the Club to divulge the findings of any future P&I condition survey to another P&I underwriter asked to quote on the vessel) (see above).

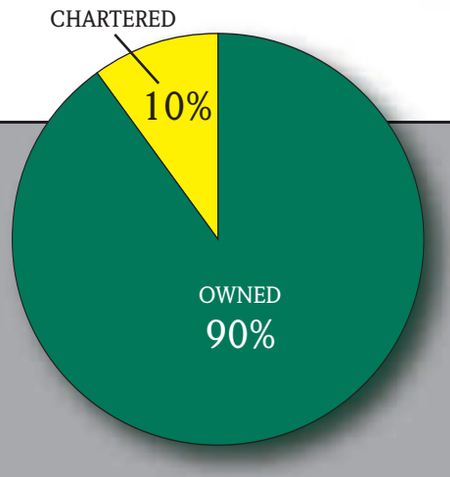
6. Clubs shall undertake a condition survey on any vessel that appears on the EC Blacklist.

7. Clubs shall ensure that (a) the survey department reports, not only to the underwriting department but to the senior management, any vessel which causes concern and (b) the senior management or a nominated alternative shall approve all new members.

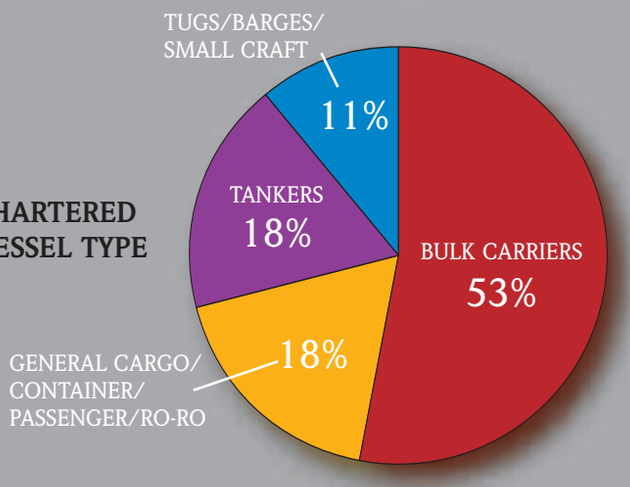
American Club Fleet 2006

SPLIT BETWEEN OWNED AND CHARTERED ENTRIES

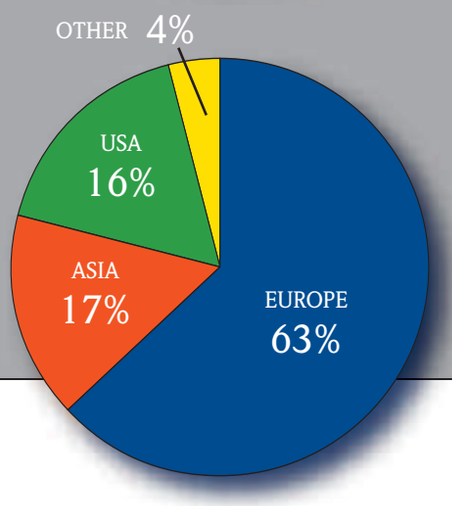
Pie chart represents a total of 22.4 million gt



OWNED AND CHARTERED TONNAGE BY VESSEL TYPE



OWNED AND CHARTERED TONNAGE BY MANAGEMENT DOMICILE



THE AMERICAN CLUB

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