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The Maritime Industry and the Human Element Phenomenon

El Ashmawy, M.E
Prof. Captain, Arab Academy for Science Technology and Maritime Transport,
mohyldin_a@yahoo.com & mohyldin@aast.edu

Abstract: There is no admitted international definition of the term the "Human Element". The human element is an expression commonly used in the context of the maritime industry in which it plays a significant and topgallant role in defining and assigning policy options, and is directly or indirectly addressed in diverse aspects of papers dealing with the shipping industry.
The shipping industry is a services industry in which the human element is the climatic feature of all aspects. The IMO, through its Resolution A. 947 (23) - Human Element Vision, Principles and Goals for the Organization, refers to The Human Element as: "A complex multi– dimensional issue that affects maritime safety, security, and maritime environment protection, it involves the entire spectrum of human activities performed by the ships, crew, shore–based management, regulatory bodies, recognized organization, shipyards, legislators, and other relevant parties, all of whom need to cooperate to address issues effectively".
It is mostly stated that 80% of all accidents at sea are assignable to the human element's errors. Although the human element could be the diametric incentive of an accident, the original cause can mostly be attributed to human influences in the shipping industry. The human element is one of the most important contributory effects to the causation and avoidance of accidents.
In this paper I would like to draw attention to, and raise awareness of maritime professionals in the shipping industry to human element issues and I would deal with all topics relevant to human element phenomenon; focusing simultaneously on the pros and cons of this issue. I will also try to justify why almost all accidents are only attributed to the "human element". This paper aims at highlighting the proper perspective for understanding how far "the human element" contributes value across maritime industry.
Keywords: human element phenomenon, pros and cons, maritime industry.

1. Introduction

The maritime/shipping industry is a services industry in which the human element is a critical element. The human element is one of the most important contributory aspects to the causation and avoidance of accidents. This industry is a truly global market, and it is one that economists prefer to think of as capital intensive due to the tremendous costs of the developed equipment used. The industry is run by people for people. This industry has to reach out to every sector of the community if it is to attract the best people to pursue maritime careers. Effectively, the

industry is the facilitator of the global economy as there is no obvious sign of any new technology on the horizon that will replace shipping as the most cost-effective means of transporting goods, components, raw material and others around the world. It seems reasonable to assume that, as the 21st century progresses, the industry will have an impact on the lives of more and more people.

The industry's diverse workforce includes seafaring as well as shore-based professionals coming from around the world. From ship brokers to ship builders, from fleet managers to marine risk managers, from naval architects to shipping analysts, from chief engineers to chief accountants... the choices are as wide and variable as the seven seas and oceans.

2. The Maritime Industry

The maritime industry is much more than the deep-sea merchant fleet. It includes port and terminal operations, shipbuilding and repair, naval architecture and marine engineering, seaman training, tug and barge operations, pilotage, forwarding, chartering, government programs and shipping, intermodal services, maritime law, passenger and excursion services, vessel classification, marine insurance, communications, recreational boating and yacht, and much more.

It has contributed to the progress of nations and the world in that the development of modern transportation systems worldwide and economic globalization has been driven by the maritime industry, the transportation industry leader.

Besides the progress of the world's port operations, shipping and shipbuilding has also contributed significantly to the global economy through its requirement for supporting services such as ship financing, marine insurance, maritime legal and arbitration services, maritime education and training, maritime research & development etc.

The number of ships sailing the seas is progressing quickly. There is also a heyday in the number of larger and more technologically advanced vessels. Is not the human element the one responsible for running the work of all these previous issues with all their pros and drawbacks?

3. The shipping Industry

Worldwide the shipping industry continues to expand to meet the demands of globalization. In broadcast terms, shipping industry includes all enterprises engaged in the business of designing, constructing, manufacturing, acquiring, operating, supplying, repairing, and/ or maintaining vessels, or component parts thereof: manning and/or operating shipping lines, stevedoring and customs brokerage services, shipyards, dry-docks, shipping and freight forwarding services and similar enterprises. Shipping has played a significant role in the development of human society over the centuries.

3.1 Nature of the Shipping Industry

Shipping is certainly the most international of the entire world's enormous industries; it is devoted to moving goods or passengers by water. Shipping is a peculiar, highly competitive business and services industry. It remains today what it has been for centuries; the most important, the safest, the cheapest and the most environmentally friendly way of moving goods over long distances. It has been a crucial link by which commercial relationships have been established. Also, shipping provides a

safe, healthy and secure work environment "so that people want to work in shipping, where they can enjoy rewarding careers and achieve their full potential".

The activity of the industry is divided into several categories, namely: liner services, rambler shipping, industrial services, and tanker operation, all of which operate on certain well-established routes. Without the shipping industry, the world's economy would grind to halt. The purpose of shipping is to provide a profitable service which the economists prefer to think of as "capital intensive".

The shipping industry remains a stimulating, hiring and fulfilling vocation; a vocation that can employ human elements almost anywhere. Seafaring is not only a favorable and worthwhile vocation choice in itself, it also permits a vast diversity of related jobs ashore for which experience at sea will make one notably qualified.

3.2 Shipping is a Progressing Industry

Shipping is a progressing industry; turbulent and challenging. It plays an energetic role in world trade and is the backbone of the world economy. Without shipping and the transportation services that ships provide, the world would not be as thriving as it is today and many countries would not be able to participate in world trade.

In recent years, shipping has been shown to be a progressive industry as attested to by the increase in gross tonnage of the world fleet. This progress makes the shipping and transport industry so complex and so exciting to work in. The motives are driven by the progress rate of the trades, the ups and downs of business cycles, as well as by a large number of external innovation triggers. Managing these challenges requires not only professional training of the highest standards, but also a through academic understanding of specialized knowledge domains.

There are different categories of maritime professionals such as port managers, maritime officers, engineers, economists, lawyers, shipbrokers, charterers, and naval architects.

Where does the shipping industry's human element obtain their education and training? A number of them have special maritime education or have been educated in a specialist domain. Another category have been trained on the job. What all people have in general is their inclination for the industry, their international mindset and their commitment to continue working in this highly interesting field of business.

3.3 Treaties and Conventions Related to Maritime/Shipping Industry

Many treaties and conventions have been adopted over the years with the objective of increasing the safety of life at sea. Under the International Load-Line Convention of 1930, ship loading was regulated on the basis of size, cargo, and route of the vessel. The International Convention for the Safety of Life at Sea (SOLAS), which governs ship construction, was adopted in 1948 and again in 1960 and 1974.

4. The Human Element

The human element is the one essential that is extremely difficult to modify since it needs a modification in both intentions and attitudes; it is an expression commonly used in the context of the maritime industry as well as shipping industry. The human element is a complex multidi-

mensional issue that plays a most vital role in the operation of industry, in enhancing maritime safety, security and marine environment protection.

It is human nature that handles what occurs daily at work; from the routine tasks of a ship's rating right through to the policy decisions of the IMO. It embraces the integral spectrum of human activities performed by the crew on ships, shore-based personnel, organizational bodies, recognized organizations, shipyards, legislators, maritime education and training and other related parties, all of whom need to cooperate in addressing human issues effectively. It is recognized that the quantification of the human element in general and its role can influence the methods of upgrading safety management systems. All should cooperate to address the human element.

The human element has a role to play in improving maritime safety:

- Commitment from the top, in every organization
- Effective control and monitoring mechanisms
- Quality standards in force
- Training and updating
- Transparency
- Safety culture: safety can never be taken for granted, permanent attention is required.

The human element remains a basic component for all its strengths and weaknesses that can either cause a disaster or prevent it.

The human element is commonly deemed to be the most significant asset of a shipping management company. The majority of the ship operations look for high quality and well trained staff to be utilized both in the shore-based management side as well as on board ships. This is considered as a benefit in safety, ensuring marine environmental protection from ships and the process of competitive ship management.

Efficient and safe transport systems need to put the obvious focus on contributing to the human factor in all respects. Human centered approaches are encouraged for enhancing transport systems, in particular for those with the highest demand for technological improvement. By centering on the human element generally, the IMO is invigorating the link between management ashore and functioning afloat to enhance the safety culture. The execution of safer, secure and effective shipping on clean oceans will continually be dependent on the human element.

4.1 Women in Maritime/Shipping Industries

Women have an important role to play in maritime administrations of their countries and already work at all levels of national ministries responsible for shipping and ports as well as other maritime authority levels.

In placing the human element and capacity building high on its agenda, the IMO recognizes that the shipping industry must reach out to every sector of the community if it is to attract the very best people to pursue a maritime career. The IMO therefore takes specific measures, through its strategic planning and at the operational level of technical cooperation, to promote the increased participation of women in the maritime sector.

The IMO initiated a strategy for the Integration of Women into the Maritime Sector (IWMS) in 1988 and began implementation of the IMO Women in Developing Program in 1989, concentrating on equal access to maritime training through both mainstream programs and gender-specific projects. The program continues to support measures to increase the participation of, and the establishment of formal regional associations for, women in the maritime industry. The increased percentage

of women in students at the World Maritime University (WMU) and the International Maritime Law Institute, Malta, illustrate programs with wider influence at the highest level of maritime training.

During 2005, activities under the program for IWMS included the provision of short-term fellowships and an ongoing series of regional workshops. The Technical Committee was informed that there has been a noticeable increase in the number of women employed at the management level in national maritime and port authorities and this has enabled the Secretariat to work on the facilitation of the establishment of formal networks or associations for women employed in maritime authorities, in ports, and in related maritime employment such as lecturing in maritime institutions.

4.2 IMO and the Human Element

In the IMO, the focus is stronger than ever on the human element and it is continually seeking ways to improve safety at sea. In the 20th session in November 1997, the IMO assembly adopted resolution A.850 (20) on the human element vision, principle and goals for the Organization. The resolution acknowledged the need for increased focus on human-related activities in the safe operation of the ship, and the need to achieve and maintain high standards of safety and environmental protection for the purpose of significantly reducing maritime casualties.

The resolution was adopted by resolution A.947 (23), human element vision, principles and goals for the Organization, adopted by the 23rd Assembly in November-December 2003. If, as is frequently stated, all marine casualties and incidents involve human factors in one way or another, for this reason, IMO has reinforced its focus for the 21st century to place the emphasis on people and has included the human element as a mandatory consideration in the work of all of its Committees and Sub-Committees. This means that matters concerning people, seafarers in particular, will be woven into the context of all international regulatory regimes.

In recognizing what should be obvious: that skilled, educated and qualified seafarers are of fundamental importance, IMO decided to enhance its emphasis on training and certification by accelerating the much needed updating of the 1978 STCW Convention as amended.

4.2.1 World Maritime University "WMU" Graduates

WMU graduates form an exclusive group of highly trained maritime experts who act as catalysts for change nationally, regionally and internationally. They are, in their role as managers of change, very quickly gaining a firm grasp of the direction of future global developments. WMU graduates, male and female, invariably go on to become committed people working for safe, secure and clean oceans.

WMU graduates have returned to their home countries to take up a wide variety of pivotal positions in maritime/shipping industries. Some have high positions in their government while others have pursued career paths that have led to senior jobs in shipping companies, regional maritime organizations and national port and harbour authorities. Still more have become educators and senior surveyors. Many have returned to the IMO as part of their national delegations.

4.3 International Measures Related to the Human Element

The two international measures that are at the core of IMO's commitment to addressing the human element in the maritime industry and directly designed to affect the culture and process of seafarers on board ships and within shipping companies are:

- **First:** The revised Convention on Standard of Training, Certificates and Watch-Keeping for seafarers "STCW Convention" as amended.
- **Second:** The International Safety Management Code "ISM Code".

The two conventions provide a set of practices and a safety system which will enhance continued success for the future of maritime industry. With the adoption of the ISM Code and STCW Convention as amended, the IMO has highlighted the dominant role played by the human element and management in safety at sea and environmental protection.

The ISM Code is the other part of IMO's human element initiative that deals with management. The essence of the ISM Code is its distinct focus on the human element. In the vast majority of cases, accidents happen because somebody, somewhere along the line, did not take the proper action to avoid a problem, or did something wrong, whether through laziness, ignorance, fatigue, negligence or stress. The ISM Code outlines the responsibility and authority of the master of the ship. The Code also deals with other seagoing personnel and emphasizes the importance of training.

The revised STCW convention puts in place the enhanced training and watch-keeping requirements which will continuously lead to a more skilled and flexible labor force. It will provide the framework to ensure that the personnel are appropriately trained and possess the skills to do the job properly. The Convention has highlighted the importance of the qualifications of shipboard personnel and the importance of MET for such personnel.

It is a very important instrument to deal with the influence of the human element and accidents. The Convention certification focuses on the human element including verification that vessel watch-standers have enough rest, basic language ability, safety training and that the crew is competent.

4.3.1 The Characteristics of the STCW Convention and ISM Code

The characteristics of the STCW Convention adopt that the human element is of a crucial significance in any institution and that education and training are vital to improve the skills and competencies of the human element.

The ISM Code sustains the STCW Convention perspective by setting assurances and frequently developing the safety management skills of personnel ashore and afloat, and ensuring that personnel are adequately qualified and certificated. The introduction of competence-based training and assessment has strengthened the steps towards a safety culture and has led to an important strengthening of conjunctions between the training suppliers, shipping companies and their staffs. The challenge of the Convention and the Code is to guarantee that the human element, safety and quality system programs become institutionalized as we go ahead.

4.4 The Human Element and Improving Safety

There are many groups involved in improving safety at sea, including the IMO, member governments, ship owners, insurers and classification societies, but of all involved, no one has greater interest than the seafarers – for if something goes wrong, they are the only ones who risk losing their lives. It is often said that most accidents at sea are caused by human error. The main reasons for accidents may be poor judgment, complacency, disregard of basic seamanship and inexperience.

IMO has emphasized the importance of high crew standards and adopted from early times recommendations calling upon governments "to ensure that the MET of master, marine officers, engineers, and seamen is kept up-to-date and in step with modern technological developments in this field.

5. The Human Factor

The use and operation of any means of transport always involves human individuals. This is often an interactive process, and is strongly influenced by "human factors" such as professional training and behavioral responses.

Human factors can refer to impacts on individuals who are directly concerned with transport systems, such as operators. In this context, an important area is the working conditions of the employees. Conversely, human factors also refer to the impacts of human behavior on the performance of transport systems. Human factors are strongly linked to the themes of safety, efficiency and social impacts of transport.

It has been declared that the overwhelming majority of accidents at sea are caused by the so-called "human factor" of ship operation, whether as a consequence of bad seafaring or poor management on shore, and the vital factor in the successful implementation of an SMS is the selection of the right personnel to fill positions influencing their actions and performance.

Because we frequently see this factor, we tend to attribute accidents to the errors of the individuals responsible for the operation of the ship. It is however a reality that the majority of the accidents are caused by an unfortunate integration of human and organizational errors.

The main fact is that the human factor plays some part in substantially every accident, including those where construction or equipment failure may be the immediate cause.

The most important aspects of human factor related accident causes in shipping are language deficiencies of multi-cultural crews and resulting misunderstandings. Various examples of incidents and accidents are related to communication problems in open seas or under pilotage, covering both ship-to-shore and on board communication. Besides language deficiency, peculiar habits and principal cultural differences do contribute to safety critical situations.

5.1 The human factor in ship safety "Individual error"

- Errors from individuals are also responsible for some accidents. The chain of occurances which can lead to accidents was, for example, originated by some incomplete maintenance duty.
- Errors related to human/system interfacing are considered as system errors. The said error involves layout error, surreptitious errors, wrong alarm, etc. They have to be addressed by the design engineer and the ergonomist.

The role of the human element in secured effective implementation of globally adopted standards should be to secure a common understanding of the responsibilities

of flag states and to promote the adoption of best practices by the publication and dissemination of well-researched studies into the cause of accidents. In waterborne transport, human centered system design approaches were identified as a positive factor for job satisfaction of seafarers.

The ship's crew remains the most vital element for safe and efficient work on the ship, despite the development of technology, and no ship is any better than her crew.

On a ship, the human element can provide a weather eye for difficulties ahead, a calm, frumpy and unflinching response to situations as they develop and those indefinable qualities known as good seamanship or it can be feeble, lacking in competence, ability and concentration.

6. The Maritime/Shipping Industry and The Human Element

The shipping industry is run by people and for people. The human element designs ships, builds them, owns them, crews them, maintains them, repairs them and salvages them. Human elements regulate them, survey them, underwrite them and investigate them when some things go wrong or mistakes happen. Human elements work in education and training, and they are at the very center of the shipping enterprise as well as in port management. They are the secret of its progress and successes and the victims of its failures. While those human elements diverge in all modes and mores, they are all, however, human elements with the same imperative set of potentialities and vulnerabilities.

The principle factor in maritime safety is the human element and the term "human element" is normally associated with those at the lower end of the shipping hierarchy such as the crew members, port operators etc. It should be extended to cover everyone involved and it should be professed that shipping safety is not as good as it should be because of matters at the top rather than inefficiency at the bottom.

Senior management should regard the provision of human element suited to the task and provide all the necessary means by which to improve an appropriate Safety Management System (SMS) which complies with the requirement of the ISM Code.

Worldwide regular implementation of SMS "Rules and Regulations" is of high importance. Development of enforcement by flag states and classification societies and augmenting port state control will improve the quality and safety in shipping industries. Consideration of the human element by all players will eventually lead to more cost-effective solutions with long-lasting influences.

A vital factor in the successful implementation of a SMS is the selection of the right personnel to fill positions influencing its actions and performance.

A focus on the human element should be the primary prevention measure. Nationally and internationally, flag states should emphasize the human element in implementing the STCW95 convention and the ISM Code. The human elements are also in focus when it comes to training, certification and watch keeping.

Seafarers as worthwhile human resources are not only directly inclusive in the maritime industry because of their working on board, but are also participating with the employers ashore, which could be considerable for some shipping companies. With the implication of seafarers, the capability of the shipping company could be further scrutinized.

6.1 Some examples of the human element in maritime industry

6.1.1 Science, engineering and technology: Marine science engineering and technology are about future endurable use of the seas. Design of ships, boats and other offshore structures is one key field of activity. Qualified marine engineers excogitate propulsion and control systems for ships, oil platforms, underwater and offshore vehicles and much more such as dynamic positioning "DP".

Other professions include naval architects who specialize in the design, construction, conversion, repair, surveying and decommissioning of ships, boats and offshore structures. Offshore engineers design and produce fixed and floating offshore oil production installations.

6.1.2 Maritime Business: The maritime business employment field includes marine insurers, shipbrokers, accountants, bankers, vessel financiers and charterers, ship managers and port managers.

6.1.3 Sea going and Ports: The port sector provides the vital transport networks which support domestic and international trade. The ports sector includes ports, harbors, container terminals, stevedoring companies and specialist labor supply organizations.

Harbor masters, marine pilots, and operators of vessel traffic services are employed to ensure the safe navigation of ships in harbor waters. Port operators are engrossed in ensuring that freight is moved efficiently from a ship moored at the quayside directly to its intended location. Engineers are employed to ensure that plants, vehicles, boats and infrastructure are well maintained and repaired. Mechanical, electrical and civil engineers work in ports on a wide range of specialist equipment and structures.

6.1.4 In terms of seagoing people:

Deck officer:	With high qualifications, he is responsible for controlling navigation, communications, safety and security using the latest technological systems.
Engineering officer:	With high qualifications, he is responsible for operating and maintaining all the mechanical and electrical equipment throughout the ship at sea.

7. Human Error

One of the common phrases used in shipping is that the most accidents at sea are caused by human error, and the question here is, why highly skilled, well-trained professional seafarers make errors. So, we should find an answer to this puzzle. Human error has remained tenaciously high as the prime cause of accidents and claims.

Whenever a serious shipping accident happens there is definitely turmoil to find someone to place the blame on. The reason why ships fall apart, founder, collide with each other, run aground, break up, catch fire and whatever else may befall them is rarely, if ever, because there

is something substantially wrong with the system. In a large number of situations, it is because somebody, somewhere along the line, did not take the proper action to avoid a problem or did something wrong, whether through laziness, ignorance, greed, malice, fatigue or negligence. This, incidentally, stresses how vital it is that IMO's focus on the human element, as demonstrated by the introduction of the ISM Code and the updating of the STCW Convention, must be sustained.

About 80% of accidents are attributable to human element errors or disregard. So most of these accidents can be reduced or impeded if safety is given priority, when the attitudes of seafarers are promoted and if the promotion of these attitudes is an advanced process to which the entire community is committed.

Human error, a complex matter, may include inadvertence, pilot-master relationships, low or poor physical fitness; poor eyesight; high fatigue; high alcohol use; high personnel turnover; high level of estimated risk; improper lights and marks; misuse of radar; uncertain use of sound signals; inadequacies of the rules of the road; etc.

Human error can be classified into 3 major categories with the same approximation of the STCW Code 95 amendments. The 1st category is operational, i.e., based on human error. The 2nd category is the management of human error, and the 3rd category is the combination of the 1st and the 2nd, which might cause considerable accidents or disasters by triggering chain events.

It is stated that errors including characters of the system in shipping lie in the social organization of the personnel onboard, economic pressure, the structure of the industry, and insurance and difficulties in international regulation.

We know that there is scarcely a technical solution that the human element is unable to evade, ignore or fails to maintain or break. The risks associated with human error will continue with the resulting loss of life, injury and pollution. The economic losses assignable to human factors have been shown to be significant.

7.1 Causes of Injuries and Incidents

While human errors are centered on inadvertence or improprieties on the part of the operator more than they are symptomatic profound and complicated problems in the inclusive maritime system, human errors are in general caused by technologies, environments, and organizations, which are discordant in some way with optimum human performance. These discordant factors set up the human operator to make improprieties.

Usually, management has tried either to blandish or forewarn its employees into not making errors, nevertheless adequate motivation could somehow overcome poorly designed management and equipment systems and natural human limitations.

The most common causes were error of judgment and improper lookout or watchkeeping, followed by failure to comply with regulations. The human element, as it is often termed in the shipping literature, has frequently been cited as a cause of these costly incidents. Some example issues for the causes of injuries and incidents are:

- Fatigue: may be because of poor health and also lessened performance.
- Stress: may be as a result of personal health and welfare.
- Health: there is a relationship between health management and safety.
- Decision making and cognitive requirements:
- Communications:

- Language and cultural variance:
- Team work: it is very important as technical skillfulness.
- Safety training:
- Safety climate and safety culture: safer shipping requires a safety culture, and there exists an important relationship between safety climate and performance.

8. Treating The Human Element as Assets or Human Capital

Human capital is the set of skills which an employee acquires on the job, through training and experience, and which increases the employee's value in the marketplace. There is the notion that the human element should be regarded as assets rather than variable costs, in other words, treated as human capital. In my opinion, human resources are valuable and a source of competitive advantage. The human element and their collective skills, abilities and experience, coupled with their ability to deploy these in the interests of the employing organization, make a significant contribution to organizational success and constitute a major source of competitive advantage.

9. Conclusion

It is explicit and indisputable that the human element is the utmost crucial part of the maritime/ shipping industry system and the chain will promptly crack in case of destitution of a qualified human element.

The human element in the maritime/shipping industry, and in particular seafarers, should be treated as a human capital who can add worth to the business with preferable protection, indemnity and deliberate investment. In order to improve and underpin the human capital management system in the maritime/shipping industry, the significant element innovating human values should not be forgotten. The correct technological infrastructure provides the materials requisite for ensuring the prosperity of knowledge management exertion between human elements afloat and ashore. Training, improving and incessant learning, inspiration of the human element value and offering a long term career progress are the probable solutions for prospective human capital management.

References

[1] Armstrong M., "Armstrong's Handbook of Human Resource Management Practice", 11th edition, London and Philadelphia, 2009.

[2] Chawla P., "Building the Company Culture. The International Maritime Human Element Bulletin" Alert, 5, 2004.

[3] El Ashmawy M., "Effective Implementation of Safety Management System (SMS): An Overview of the Role of The Human Element", "MET Trends in the XXI Century", Admiral Makarov State Maritime Academy, 2009, page 246- 255.

[4] Etman E.and Halawa A., "Safety Culture, The Cure for Human Error: A Crttique", Proceedings of "World Maritime Excellence" Odesa National Maritime Academy, 2007, page 115-126.

[5] Er Z. and Celik M. Definitions of Human Factor Analysis for the Maritime Safety management system", "Maritime Security and MET", World Maritime University, 2005, page 235-243.
[6] Graveson A., "The Human Element – Success or Failure", Proceeding of IMLA, 2000, page 46- 499.
[7] Hetherington C., Flin R., and Mearns K. "Safety in Shipping: The Human Element" Journal of Safety Research 37, 2006.
[8] International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978, as amen (STCW Convention), IMO, 2001.
[9] International Safety Management Code (ISM Code), IMO, 2002.
Sekimizu K. "The human Element in the Work of the IMO. The International Maritime Human Element Bulletin", Alert, 12, 2006.
[10] Kiriyama S., Nishimura S.and Ishida K., "Influence of Human Factor on Marine Casualties", Proceeding of Green Ships Eco Shipping Clean Seas", Gdynia Maritime University, 2011, page 169- 176.
[11] Kostylev I., "Comprehensive Review of the STCW 78 Convention and Code: Some Concepts and Trends", Proceedings of "World Maritime Excellence" Odesa National Maritime Academy, 2007, page 45-55.
[12] Maitland C., The Human Element in Safe shipping: What Sort of Researching is needed? Mare forum from Russia & Central Asia, 2008.
[13] Middleton R. and David G., "Improving the Awareness of the Human Element in the maritime Industry", issue No 1, The Nautical Institute, 2003.
[14] Mitropoulos E., "Technical Cooperation: IMO's Response to the 2005 World Summit", IMO News, Issue 3, 2006, page 4-5.
[15] O'Neil W., "A Personal Perspective", IMO News, Issue 4, 2003, page 55-58.
[16] O'Neil W., "Committed People Working for Safe, Secure and Clean Seas", IMO News, Issue 3, 2003, page 4-5.
[17] O'Neil W., "IMO- Safer Shipping Demands Safety Culture", IMO News, Issue 3, 2002, page 4-15.
[18] O'Neil W., "Raising World Standard in the Maritime Industry", IMO News, Issue 2, 2003, page 4.
[19] O'Neil W., "World Maritime Day 1998", IMO News, Issue 3, 1998, page 9-20.
[20] Payer H., "The Human Factor in Shipping Safety", Bimco Review, 1996, page 145-146.
[21] Petersen S., "The Human element", Bimco Review, 1999, page 66.
[22] Squassafichi N., "RINA, The ISM Code and the Human Element", Bimco Review, 1996, page 147-149.
[23] Squire D, "The Human Element in shipping", Proceeding of IAAST, 7th international conference: The Human Element in Safety and Survival at Sea. Sibenik: Adriamar Maritime Training Centre, 2006.
[24] Tansey P, "Women on Board- Ten Years of the IMO Women in Development Programme", IMO News, Issue 3, 1999, page 33-38.
[25] "WMU Conference to Highlight Women Successes", IMO News, Issue 4, 2007, page 39.