



SAFETY CULTURE FOR SHIPPING COMPANIES. THE STARTING POINT OF SAFETY STRATEGIES

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ABSTRACT

Maritime safety continues to be an area of concern due to the international nature of the operations and the multi-cultural staff. Although maritime industry is overregulated, the effectiveness of extensive legislation to manage safety on-board ships remains in doubt. Therefore, for ships operators one of the greatest challenges has always been to provide, support and enhance safety in the maritime domain. The authors of this paper introduce innovative ways and tools to ensure safety in the maritime domain, by shifting the definition and practical application of safety from "as few things as possible go wrong" (SAFETY-I) to the "nouvelle vague" for the study of safety "as many things as possible go right" (SAFETY-II). This paper focuses on Safety Culture Mapping, studying the aspects of Human Factors and presenting the implementation steps for shipping companies on how to advance to the next level of safety and create a new safety perception as part of an overall proactive safety practice. The scope of this paper is to provide hands-on suggestions, in terms of an action plan and to identify the factors that contribute towards a better safety climate on-board ship. To achieve this, different approaches and strategies on safety culture measurement are analysed. Moreover, the adaptation of different safety culture scaling is discussed and the most suitable scale is proposed. Finally, the paper explains and clarifies the alignment that exists between safety culture and safety climate on-board ships as perceived by seafarers and shore personnel. The implemented methodology combines attitude questionnaires with structured interviews analysis to explore and capture the current safety culture of shipping companies. In that sense, safety culture assessment is based on various methods that were identified by implementing factor analysis. This is an on-going research that has already revealed interesting findings for the safety culture of seafarers and shore personnel. The decisive actions that are required to achieve a higher level of safety are presented. The research is restricted on shipping companies with specific nationalities combination and vessel types. The innovative methodology proposed in the paper for assessing Safety Culture will assist shipping companies to identify their current safety level, analyse their strengths and weaknesses on the subject matter and then propose actions for improvement to enhance the overall safety level.

Keywords: Safety culture; Assessment; Attitudes; Non-technical skills

1. INTRODUCTION

For maritime industry, safety continues to be the focal point of concern due to the international nature of the operations and the multi-cultural staff. Although the industry is overregulated, the effectiveness of extensive legislation to manage safety on-board ships but also ashore remains

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in doubt. The existence of regulations cannot ensure by itself that everything will be operated safely. Therefore, it is also required to build behaviours, cultivate attitudes in order to reach a high level of safety. Due to the nature of the industry, safety is highly dependable on the seafarers' on-board ships, the personnel ashore and their interactions. That is why a high level of safety culture is a prerequisite for achieving high standards of safety.

The evolution of safety culture needs firstly a starting point. Therefore, the first step is to be able to assess the current situation, identify weak areas and find ways to enhance the overall safety level. This paper presents a methodology for mapping/assessing the safety culture of a shipping company and how this assessment can be utilised to initiate a change for its safety strategy and the evolution of its current safety level. The purpose of this methodology is not only to map the current safety culture level but also to identify the strong and weak points. The ultimate goal is to provide the company with specific course of corrective actions (i.e. action plan) to improve its safety level.

The first section of the paper is a literature review for the safety culture. In particular, various safety culture definitions are provided from other high-risk industries (e.g. nuclear, aviation, offshore, etc.) and from the maritime industry. Moreover, some methodologies for assessing safety culture are described to provide a clear picture of the tools that are utilised for the assessment. The section after presents the proposed methodology for assessing the safety culture of a shipping company. In the results section it is presented how the mapping of the safety culture can lead to an action plan that will assist to transform and set a new safety strategy for the company. The paper concludes with a commentary of the most significant results and insights from the assessments conducted so far and presents which the most significant factors for an effective safety strategy.

2. LITERATURE REVIEW

This section highlights definitions regarding safety culture from various high-risk industries and also presents methodologies that are used for assessing safety culture in an organisation.

2.1. Safety Culture

The term safety culture was introduced for the first time, following the accident of Chernobyl in 1986. Although, according to Cooper (2016), references regarding lack of safety culture were made in 1984 after an explosion that occurred in a chemical plant in India. The same term was also used by the United States (US) Chemical Industry Association due to the occurrence of similar accidents/incidents.

Despite the above the first definition of the term “safety culture” was given by the International Atomic Energy Agency (IAEA), following the accident at the nuclear plant of Chernobyl. According to IAEA (1986) “*Safety culture is a part of overall culture in organizations and it reflects shared belief and values amongst them. Safety Culture is basically defined as “how an organization behaves when no one is watching”.*

After this major accident, nuclear industry focused on the safety culture and since then various definitions were given which are referred to the safety-related values, attitudes, beliefs, risk perceptions and behaviours of all employees. In addition to the IAEA's definition, in 1993 the Advisory Committee on the Safety of Nuclear Installations (ACSNI) define safety culture as: “*The safety culture of an organisation is the product of individual and group values,*



attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to and the style and proficiency of an organisation's health and safety management. Organisations with a positive safety culture are characterised by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures" (ACSNI, 1993, p. 23).

The tendency that created in the nuclear industry to define, explore, assess and enhance safety culture was gradually followed by other high-risk industries, e.g. aviation, offshore, railways etc. In particular, Sharon (1998) highlighted that British Rail has a low level of safety culture, which attributed to the accident at Clapham Junction London in 1988, where 35 people lost their lives.

Piers et al., (2009) provide another definition of safety culture focused on aviation, because as they claimed, slogans (e.g. "how people behave when no one is watching") may create confusion for understanding and mapping safety culture. Hence, they established a framework where they defined safety culture in two levels: the top level and the full definition. The full definition of safety culture "is the set of enduring values and attitudes regarding safety issues, shared by every member of every level of an organization. Safety Culture refers to the extent to which every individual and every group of the organization is aware of the risks and unknown hazards induced by its activities; is continuously behaving so as to preserve and enhance safety; is willing and able to adapt itself when facing safety issues; is willing to communicate safety issues; and consistently evaluates safety related behaviour" (Piers, et al., 2009, p.5).

2.2. Safety Culture in maritime industry

Based on Rothblum (2000) a significant number of studies conducted in the 90's, have resulted that the main root cause of the accidents in maritime industry is human error. Berg (2013) further elaborated on that and he also claimed that maritime is one of the most dangerous high-risk industries. International Maritime Organisation (IMO) (2019) categorised the industry within the most dangerous high-risk industries.

Despite that, the maritime industry has a reactive approach to safety, i.e. it establishes measures/regulations after the occurrence of major accidents. In particular, the accident of Herald of Free Enterprise in 1987 was the starting point for the International Safety Management (ISM) Code. Furthermore, the accident of Exxon Valdez was the main reason for the OPRC Convention and major amendments in MARPOL in 1992 (Schröder-Hinrichs et al., 2013).

All these facts made the industry gradually to focus on human element, hence on safety culture. For the maritime industry and especially tanker sector the term safety culture was defined in Oil Companies International Marine Forum (OCIMF) Tanker Management Self-Assessment (TMSA) second version as "A philosophy promoting safety as the ultimate consideration for all company personnel and applied to all activities undertaken, both ashore and at sea" (OCIMF, 2008, p. 48). The definition remains the same in the third edition of TMSA (OCIMF, 2017, p. ix).

The International Chamber of Shipping (ICS) (2013) presented another definition of safety culture: "the values and practices that management and personnel share to ensure that risks are always minimised and mitigated to the greatest degree possible". ICS also presented three



key ingredients/components for a shipping company to cultivate an effective safety culture: Top management commitment, Measuring performance and behaviour and Modify behaviour.

Since 2005, British Petroleum (BP) has implemented several strategies to improve the safety of seafarers on board its ships. Following the oil spill that occurred in 2010, BP made efforts to change its safety culture. This was achieved by analysing various kinds of data (e.g. incidents and accidents reports etc.) in an effort to identify factors that significantly affect the level of safety. According to [Ultius \(2014\)](#) some of these factors are communication between employees, training and the perception of employees about the possible consequences of their actions, whether positive or negative.

In that sense, BP presented its safety culture ladder, which is a way to develop a safety culture in an organisation. The ladder has 5 level ranges from “Pathological” to “Generative”, as described below ([BP, 2014](#)):

1. Pathological: Employees do not really care about safety;
2. Reactive: Safety is taken seriously, but only for a short period of time after an incident/accident;
3. Calculative: Lots of data is collected and analysed, and lots of statistics are generated from them but it is mostly descriptive.
4. Proactive: People start to try to predict what the next incident might be, and resources are made available to fix things before incidents occur.
5. Generative: Management knows what is really going on in the business because the workforce trusts them and is willing to tell them.

2.3. Safety Culture assessment

There is a significant number of studies for assessing safety culture some of them are presented in this section. [Lee and Harrison \(2000\)](#) utilise a 120-item questionnaire to assess the safety culture of 3 nuclear stations in United Kingdom (UK). The questions were related to 8 main domains which were, confidence in safety, contractors, job satisfaction, participation, risk, safety rules, stress and training. The main outcome of the study was that similar survey can be used not only to assess but also to monitor the evolution of the safety culture.

[Piers et al. \(2009\)](#) apart from the definition of safety culture they also proposed a small Safety Culture framework, focused on civil aviation in Europe. The authors support that safety culture is a multi-dimensional construct and it is related with six main factors: 1) Commitment, 2) Behaviour, 3) Awareness, 4) Adaptability, 5) Information, 6) Justness. The results of the assessment are expressed in a score, which indicates the safety culture of the organization. The score is in consistency with the maturity level as shown below:

1. Pathological: Who cares as long as we are not caught;
2. Reactive: Safety is important; we do a lot every time we have an accident;
3. Calculative: We have systems in place to manage all hazards;
4. Proactive: We work on the problems that we still find;
5. Generative: Safety is how we do business around here.



Furthermore, [Onen \(2016\)](#) implement the European Commercial Aviation Safety Team (ECAST) model to determine whether it is appropriate to measure the safety culture of certifying staff, non-certifying staff, and mechanics in an aviation maintenance repair organisation. A 6-dimensional questionnaire was used, with 52 questions and the responses were addressed on a 5-point Likert Type. The analysis concluded that the safety culture in maintenance repair organisations can be measured by the ECAST model.

For maritime industry, [Håvold \(2005\)](#) developed a 40-item safety culture questionnaire. The questionnaire was distributed to seafarers of Norwegian shipping company both on-board ships and ashore (i.e. in a seminar in Manilla). The results from the 349 gathered questionnaires presented that management attitude to safety, safety behaviour, knowledge, attitudes towards safety rules and employee satisfaction were the most important factors.

Additionally, [Håvold \(2010\)](#) developed a questionnaire for assessing safety culture and to analyse the level of safety on fishing vessels. In particular, 209 fishermen were involved in the study. The main outcome was that the management's attitude on safety strongly affects the safety policy strategy of the company.

[American Bureau of Shipping \(ABS\) \(2014\)](#) developed a methodology for assessing the safety culture of a shipping company. The goal of the methodology is to develop a questionnaire to assess the current safety culture level, identify strengths and weaknesses of the organisation related to safety culture and enhance them. The questionnaire dissemination will be conducted to both shore and sea personnel. ABS related safety culture with eight key factors are: 1) Communication, 2) Empowerment, 3) Feedback, 4) Mutual Trust, 5) Problem identification, 6) Promotion of safety, 7) Responsiveness and 8) Safety awareness.

Finally, [Arslan \(2016\)](#) developed another safety culture assessment and improvement framework focused on shipping companies. The methodology analyses the current level of safety culture by utilising seafarer's attitudes, leading/lagging indicators and key performance indicators. The analysis results to the identification of weak safety areas and assists to the establishment of new strategy and actions to enhance/improve them.

3. METHODOLOGY

The purpose of the proposed methodology (**Error! Reference source not found.**) is to map/assess the current safety culture of a shipping company, to identify strong as well as weak areas and lead to the compilation of an action for the enhancement of the weak areas to evolve/improve the overall safety level of the company. To achieve this, safety culture is analysed into two main groups of factors, as described below:

1. People Factors; and
2. System Factors.

People Factors, is a group of 10 factors that are related with employees (both ashore and on-board) personal attitude about safety. Indicatively, some of the factors along with their definitions are:

- Human Behaviours. The company believes that behaviour has an impact on safety. The safe behaviours of the seafarers and the personnel ashore are clearly defined;
- Human Limitation. The company is aware that there are human limitations which impair human performance, e.g. fatigue, stress (work-related or emotional) etc.;



- **Safety Accountability.** Safety culture is clear throughout the company. In every incident (good or bad) the managers will undertake the responsibility and they will not try to blame other employees. Every employee is aware of his/her role and his/her contribution to the safety strategy of the company; and
- **Caring and Recognition.** The culture of the company is to recognize and help employees with the potential difficulties they face. There is a “no blame” culture for incidents and accidents.

Systems Factors, is a group of 25 factors that are related with employees (both ashore and on-board) about how their company operates in terms of safety. Indicatively, some of the factors along with their definitions are:

- **Strategic Planning.** Safety is a part of the strategic planning of the company, where there is a solid vision and clear goals to achieve it;
- **Communications.** Open and effective communication (both vertical and horizontal) amongst employees as well as between shore and sea personnel;
- **Hazard Identification and Reporting.** Reporting of incidents/accidents aims to identify any possible safety gaps, fix them and consequently improve the safety of the company and not to assign blame. Every employee should feel comfortable to report/point out safety issues or violations;
- **Change Management.** The company has the ability to adopt and implement innovative ideas for improving procedures. The employees are adaptable and open to changes;
- **Human Resources.** The way that the company manages safety with regard to its human resources; and
- **Safety Process Effectiveness.** The effectiveness of the safety management processes of the company.

Each factor (i.e. 35 factors in total), in the above-mentioned groups receives a score that measures its deviation from a pre-defined target value. Therefore, the assessment measures the distance of the actual from the ideal safety culture. The approach is conducted by utilising and combining the results of two main tools, i.e. questionnaires and interviews that are described below.

3.1. Questionnaires

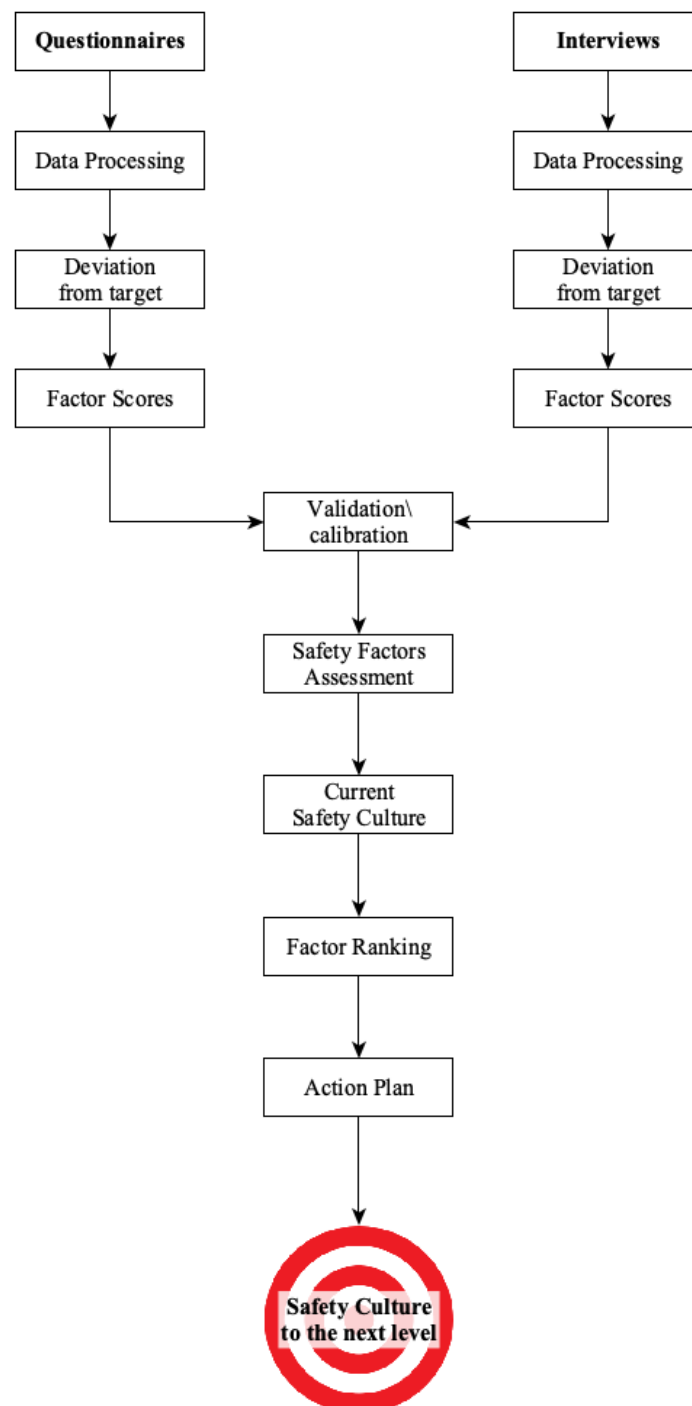
A thorough literature review was conducted from the majority of high-risk industries to gather the required information for the elements of the questionnaires. The development of the questionnaire was based on the research conducted by [Ventikos et al., \(2014\)](#). Following the discussion with experts and the testing of the questionnaire, two different sets of questionnaires were developed; one for the shore personnel and one for the sea personnel, i.e. seafarers.

The questionnaire consists of specific statements that are attributed to each factor as described above. Through the questionnaire, the target is to determine the attitudes of the employees towards the different elements of the safety culture model (i.e. People and System factors). In all the statements of the questionnaires, a 5-degree Likert scale is applied (i.e. strongly disagree, disagree, neutral, agree, strongly agree). Employees may also choose the

option of “Do not know”, if case they do not aware od they do not have an opinion for a statement.

To identify and exclude non-attentive participants the presence of control questions was considered necessary. Additionally, there are statements that are attributed to the same factor but they have an opposite meaning. Furthermore, all questionnaires are anonymous in an effort to overcome participants’ concerns regarding the existence of blame culture.

Figure 1: Graph that represents the proposed methodology





In particular, the questionnaire is divided in four main parts:

1. Introduction;
2. Main section (i.e. statements);
3. Demographics; and
4. Comments.

The first part is a paragraph providing details regarding the study, along with the instructions on how to complete the questionnaire. The second part, which is the main part, has in total 70 questions attribute to the various safety factors. Indicatively some statements are presented in Table 1, below. In the section of Demographics (i.e. part 3), participants will be requested to provide data that will be utilized in the study, e.g. rank for the seafarers, job position and/or department for the shore personnel.

3.2. Interviews

Following the finalisation of the questionnaires' dissemination, the methodology utilizes another significant tool i.e. conduct of interviews. The interviews are semi-structured conversations (i.e. guided by the interviewer) that are used to validate/calibrate the results from the questionnaires.

During an interview, there is more time for the interviewees to express their opinion and for the interviewer to extract more valuable information and insights into the safety culture of the company.

In particular, the interviewer has a set of 30 to 35 questions. Indicatively some questions are given in Table 1, below. The questions that are used in the interviews process are similar to those in the questionnaires and they are also attributed to the safety factors in the same way as in the questionnaires. In that way, validation/calibration process can be conducted. It is noted that the interview process lasts about 15-20 minutes per interviewee.

Table 1: Indicative statements and questions that are used in the questionnaire and the interviews of shore and sea personnel

Statement / Question	Tool
The company encourages its seafarers to report their mistakes.	Shore - Questionnaire
Human errors that happen on-board are an indication for crew ineffectiveness.	Shore - Questionnaire
Can you think of situations when you had to accept a high risk in order to keep up with the commercial time schedule of the company?	Shore - Interviews
When employees are involved in a failure (or incident), do they accept their responsibilities?	Shore - Interviews
Managing the behaviours of seafarers is directly connected to ensuring and enhancing safety on-board.	Sea - Questionnaire
The quality of communication between crew members does not threaten safety on-board.	Sea - Questionnaire
Do you believe that the company appreciates that their seafarers experience difficulties while fulfilling their duties?	Sea - Interviews



Do you know what are the specific targets that relate to safety?

Sea - Interviews

3.3. Implementation

According to **Error! Reference source not found.**, following the data gathering from the questionnaires' dissemination and the interviews, the factor scores are calculated for each process independently. Then, the results of the interviews are utilised to validate/calibrate those of the questionnaires. In that way the final scores for the safety factors are calculated along with the overall safety culture level.

Following the calculation of the safety factors final scores, factors are ranked to identify the weak safety culture areas that need to be improved. Therefore, each factor is relatively ranked, by considering its average value and standard deviation (Standard deviation is a measure of dispersion around the average value). Consequently, the top factor is the one that has a low average score and the deviations do not vary widely.

Based on the factors ranking the compilation of the action plan is conducted, to provide the main issues that the company should prioritize for improvement (i.e. the bottom performing People and System factors) as well as to highlight the top performing safety factors for both groups of safety factors.

The methodology is applicable for both shore and sea personnel. The analysis of both shore and sea personnel at the same time period is proposed, to gather data and proceed with the comparison of the safety culture between shore and sea personnel. The comparison provides a better overall image of the company's safety culture. In particular, for the shore personnel it is proposed all employees to participate in the questionnaires process and also the vast majority (e.g. more than 60%) in the interviews process. On the contrary, for sea personnel the methodology is proposed to be applied in a representative sample of the pool of seafarers that the company employs, based on the fleet that it operates. Furthermore, the methodology can be also applied only to shore or sea personnel.

4. RESULTS

According to the data gathered in the demographic section, various comparisons can be made among the departments of a company ashore, among the ranks of seafarers as well as between shore and sea personnel. Specific statistical tests (e.g. Mann-Whitney U non-parametric test) are also conducted to identify if the observed differences are statistically significant or not. As mentioned above the comparison of the safety culture between shore and sea personnel provides a better image of the company's safety culture, hence the action plan can be more enhanced.

4.1. Overall safety culture

The overall safety culture provides an indication of the safety level of the company and the comparison among the departments can highlight which departments operate under an increased safety awareness compared to others.

The comparison between shore and sea personnel can identified gaps between the two main group of employees. It is noted that so far, seafarers presented a better safety culture level compared to the shore personnel. This can be attributed to the fact that seafarers working



environment is significantly more dangerous, hence their safety awareness and the way the conduct the day to day operations is more safety oriented.

Finally, the communication among the various departments of the office as well as between the ship and the office seems to significantly affect the overall safety culture level.

4.2. Action Plan

Apart from the safety culture level, as described above the weak areas are identified based on the factor ranking. The factors with the lowest scores provide the input to an action plan that assist companies to focus and readapt their current strategy regarding safety.

The utilisation of the action plan can provide the company the appropriate prioritization for specific safety factors that have presented low performance. This prioritization can be done at a company level (i.e. for all the employees) and according to the demographics data (e.g. department, job position, rank, nationality etc.) for specific department, rank, etc. Table 2 shows an indicative action plan for the shore personnel. A similar action plan is compiled for the sea personnel as well.

Table 2: Indicative action plan of shore personnel

Factor	Description	Proposed Actions	Applicable to
People	Safety Awareness	Training on Understanding Safety in maritime industry, Resilience issues to increase the accountability of employees.	All employees
	Personal Risk Attitude		
	Human Behaviours	Training on Resilience issues, internal communication, managing stress, self-management.	
	Human Limitations		
People	Employ Involvement and Consultation	Training on the principles on implementing Safety Intelligence (Safety accountability and caring) as well as Chronic Unease.	Top Management
System	Strategic Planning		Operations & Safety Technical
System	Hazard Identification and Reporting	Training for improving hazard identification processes and understand new ways of Safety Measurement. Set leading safety indicators. Revision of the safety management system to include new safety indicators.	Technical

5. DISCUSSION

This paper presents a methodology for mapping/assessing the safety culture level of a shipping company for both shore and sea personnel. The described methodology has been applied in more than 15 shipping companies, counting almost 400 employees ashore and more than 2000 seafarers that have been assessed so far.



The results of the above-mentioned assessments have highlighted the assessed shipping companies have a good safety standard, but the identified weakness require improvement to promote the overall current level of safety to the proactive scheme.

In particular, the lowest performance factors of safety culture for shore employees that have been identified, are:

- top management commitment;
- safety accountability;
- communication; and
- change management.

The top management commitment is considered to be one of the most significant safety factors, which is required to increase the overall safety level of the company. The dissemination of the appropriate messages to the rest of the employees, along with the vision, the principles and the goals for safety are related with these factors. According to [Kirwan \(2013\)](#) in aviation this type of leadership is called safety intelligence.

On the other hand, the most common safety factors, that presented the lowest performance for the sea personnel are the following:

- human limitations (e.g. fatigue, stress);
- human behaviours;
- caring and recognition; and
- communication.

Communication as issue on-board ships, but also between ship and shore, can be attributed to the multi-cultural crews that usually employed by shipping companies. Furthermore, there is a significant number of seafarers who believe that shipping companies do not present high levels of caring about the difficulties of their working environment. Furthermore, the seafarers seem that work under high levels of fatigue and stress, which may affect the behaviours and their performance. The latter requires further research, which is currently on-going.

6. CONCLUSIONS

According to the report of British [Maritime & Coastguard Agency \(MCA\) \(2016\)](#), the top 5 human related factors (12 in total) in the maritime industry that may cause accidents, incidents or errors are: Situational Awareness; Alerting; Communication; Complacency and Culture.

Therefore, the goal of the assessment presented in this paper is to explore the aspects of Human Factors, to assess the safety culture of a shipping company and to provide the implementation steps for the evolution/enhancement of the safety culture by establishing a new safety perception as part of an overall proactive safety practice.

A drawback of the proposed approach is that the barriers among the various levels of the safety culture cannot be strictly defined, due to the uncertainties of the calculation of the average safety culture score/level. Therefore, further research is required and it is under conduct to overcome this drawback.



One of main issues regarding the safety culture assessment, as described above, is lack of top management commitment. This highlights the need to further enhance and evolve the managers perception about safety. This can be achieved by implementing the main aspects of “Safety Intelligence” as described by Kirwan (2013) for the aviation industry, adapted in the maritime industry. An action that shows the implementation of safety intelligence in the maritime industry is CEO visits on-board ships.

Under this scheme the results of the safety culture assessment require mainly the top management commitment to proceed with the proposed corrective actions, due to fact that safety can only be improved through continuous efforts and actions (OCIMF, 2017). Consequently, the action plan, which is the main outcome of this assessment, can be the starting point for developing and implementing a new safety strategy for the shipping company, that can further enhance its overall safety level and set the basis for a proactive safety framework.

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Mrs. Katerina Skourtanioti is one of the founders and the Managing Director of VENLYS Maritime Specialisation Services. She began as a Strategic Communication and Crisis Management expert in the Maritime and Oil and Gas industries and a trainer globally for Media Handling, Crisis Communication, Leadership and Internal Communication. Katerina is also communications and crisis management expert in the maritime and oil and gas industries with over 15 years of experience as a strategic communications director in the mass media industry in Greece. She is a graduated from Athens University of Economics and Business Administration and she continued her studies abroad. She holds a master in Human Recourses Management. As a strategic business consultant, she has more than 10 years of experience in the maritime industry with special focus on Human Element and Non-Technical Skills, and safety culture strategies. Member of the Women’s International Shipping and Trading Association (WISTA). Additional she is a member of The International Propeller Club of the United States, International Port of Piraeus. She has participated with publication "Crisis Communication Plan a Luxury or a necessity? The importance of protecting the Reputation of an Organization in an Environmental Crisis” at publication description ASHRAE International Conference on Energy and Environment in Ships, May 2015. Katerina is committed to the implementation of safety intelligence in the maritime industry and the enhancement of the safety concept. Katerina has participated as a speaker at various international conferences with topics relevant to her expertise.

Mr. Alexandros Koimtzoglou currently is Research and Project Manager at VENLYS. He holds a Master on Naval Architecture and Marine Engineering from the NTUA, Greece. He also holds a MBA in Shipping from the ALBA Graduate Business School. His expertise, is in maritime safety; risk analysis/assessment and risk engineering; human factors; resilience engineering; salvage engineering (e.g., wreck removal studies); safety analysis; statistical, probabilistic and risk modelling and ship design. He participated in several major research projects in the areas of marine safety, maritime transport and systems, ship design, safety analysis and technology assessment. Furthermore, he has compiled various naval engineering studies (i.e., trim and stability booklets, inclining experiments, wreck removal operations etc.). He has published parts of his work in the following peer reviewed journals: Journal of Human and Ecological Risk, Journal of Risk Analysis and Crisis



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