

# **What Is Wrong? A Review of National, European and International Efforts in Improving the Standard and Quality of Maritime Education and Training**

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## **Abstract**

It is continually reported that 80% of accidents at sea are due to human factors, and yet no progress has been made towards reducing this percentage despite many changes and amendments to the IMO STCW Code. The question remains, why? This paper reports on the role of the national, European and international bodies, such as the national administration, EMSA and IMO in recent years, and their efforts towards improving the standards and quality of maritime education and training (MET). The paper reviews the recent changes to the IMO STCW in 2010 and identifies several deficiencies which still need the attention of the maritime community. There are special references to the grass root efforts, including the work of the networks such as MariFuture to support the wider efforts by national administrations, EMSA and the IMO.

This paper consists of two parts. Part one refers to some of the serious deficiencies identified in a recent paper published as the MariFuture Development Paper in February 2013 and part two concerns the development of a new system, called UniMET, attempting to harmonise the Maritime Education and Training applying holistic approaches.

## **Part 1**

### **1. Introduction**

Year after year, paper after paper, the IMO reports that 80% of accidents at sea are due to human factors and yet not a dent to reduce this percentage has been achieved despite many changes and amendments to IMO STCW Code. The question is why? In our view this is because sadly IMO either has to consider itself a body only responsible primarily to deal with voluntary submissions by its Member States or covering only on particular parts of the Code that its subcommittees are interested in amending. The STCW since its inception in 1978 has been amended in a piece-meal manner several times without looking at the standards [1]. We, at MariFuture [2] talked to the IMO Secretary-General, and he kindly referred us to two of his staff members. These two we contacted wished us well in our future endeavors! As a European Maritime platform working to make seas safer through the integration of maritime education, research and innovation, we intend to send this short paper directly to the IMO General-Secretary so that he is aware why we were keen to come and talk to him and his colleagues and tell him that we have something to say. We have worked hard to improve and to identify the weak and poor aspects of the IMO standards. We offered to help financially and offer our products free of charge to the developing regions of the world. So far the IMO has re-buffed us. Let us hope we can overcome the barriers and open discussions on crucial areas for the sake of safer seas.

### **2. Key areas for Improvements**

Earlier investigations had reported serious shortfalls in the IMO standards (MarTEL [3] and SURPASS [4]). It is pertinent to note that many of the reported deficiencies were taken into consideration in the STCW amendments in 2010. Making BRM and ERM mandatory was also a

welcoming development. However, there are still areas for improvement. Referring to the recent report by the UK delegation to IMO [5], there are serious concerns about the lack of English language competency by seafarers or the report concerning the increase in the number of accidents and incidents due to increased levels of automation on board vessels. The problem is that there is too much reliance on IMO and somehow there should be a realisation that there is a moral and also legal public liability which at least should make all concerned with education and training of ship officers to be more amenable to concerns expressed by leading maritime organisations regarding safety of the public at sea and ports. There are four types of **INTERCO International code of Signals** improvements and amendments to STCW Convention recommended by Szozda (2012 – see Development Paper, Improving the Safety at Sea Through Maritime Education and Training – Examples of needed amendments to STCW Code, February 2013 – [www.marifuture.org](http://www.marifuture.org)) are necessary and/or advisable:

1. Improvement of the wording
2. Harmonization with other IMO instruments.
3. Additional training emanating from existing regulations.
4. Additional training that may be foreseen with regard to current discussions at IMO.
5. Deciding on one single international Code of Signals

Item 5 is an important consideration as the confusion has contributed to several accidents at sea. The INTERCO International code of Signals and IMO SMCP Code, as shown in tables below, are different. Did they have to be different?

N-NOVEMBER	A-ALFA
O-OSCAR	B-BRAVO
P-PAPA	C-CHARLIE
Q-QUEBEC	D-DELTA
R-ROMEO	E-ECHO
S-SIERRA	F-FOXTROT
T-TANGO	G-GOLF
U-UNIFORM	H-HOTEL
V-VICTOR	I-INDIA
W-WHISKY	J-JULIETT
X-X-RAY	K-KILO
Y-YANKEE	L-LIMA
Z-ZULU	M-MIKE
5-PENTAFIVE	0-NADAZERO
6-SOXISIX	1-UNAONE
7-SETTESEVEN	2-BISSOTWO
8-OKTOEIGHT	3-TERRATHREE
9-NOVENINE	4-KARTEFOUR

**Table 1:** INTERCO International code of Signals

Number	Spelling	Pronunciation
0	zero	<u>Z</u> EERO
1	one	WUN
2	two	TOO
3	three	<u>T</u> REE
4	four	<u>F</u> OWER
5	five	FIFE
6	six	SIX
7	seven	SEVEN
8	eight	AIT
9	nine	<u>N</u> INER
1000	thousand	<u>T</u> OUSAND

**Table 2 -** IMO SMCP Codes

### 3. Example of Improvement of the wording

The International Code on Intact Stability (2008 IS Code) entered into force on 1 July 2010. Prior this date all stability criteria contained in IS Code were recommendations. After this date stability recommendations became regulations for all new ships. This should be highlighted in the text of the STCW Code. The proposed new wording is presented in Figure 1.

Table A-II/2 (continued)

Function: Controlling the operation of the ship and care for persons on board at the management level

Column 1	Column 2	Column 3	Column 4
Competence	Knowledge, understanding and proficiency	Methods for demonstrating competence	Criteria for evaluating competence
Control trim, stability and stress	<p>Understanding of fundamental principles of ship construction and the theories and factors affecting trim and stability and measures necessary to preserve trim and stability</p> <p>Knowledge of the effect on trim and stability of a ship in the event of damage to and consequent flooding of a compartment and countermeasures to be taken</p> <p>Knowledge of IMO recommendations concerning ship stability</p>	<p>Examination and assessment of evidence obtained from one or more of the following:</p> <p>.1 approved in-service experience</p> <p>.2 approved training experience</p> <p>.3 approved simulator experience where appropriate</p>	<p>Stability and stress conditions maintained within safe limits at all times</p>
Monitor and control	Knowledge of international maritime law embodied in	Examination and assessment of evidence obtained from one or	Procedures for monitoring operations and maintenance

Should be:  
**Knowledge of IMO regulations**  
 and recommendations concerning ship stability

Figure 1 – An example of where improvement is necessary in the wording of STCW

### 4. Example of a Need for Harmonization with other IMO instruments

Often different IMO standards/conventions refer to the same subject yet the regulations are described differently. An example of this is presented in Figure 2. The example concerns a stability instrument – a measure (a computer and a computer program) is expected to assess ship's stability before departure. The stability instrument should be named in the same way in both standards/convention; in this case in SOLAS and STCW. SOLAS' wording is considered more appropriate.

**Function:** Cargo handling and stowage at the management level;  
**Competence:** Plan and ensure safe loading, stowage, securing, care during the voyage and unloading of cargoes (page 118).

STCW:

- „Use of ..... *stress calculating equipment, including automatic data based (ADB) equipment.....*”

SOLAS

- „electronic loading and stability computer or equivalent means”

Figure 2 - An example of the need for harmonization of wording in the STCW and SOLAS

#### 4.1 Additional training emanating from existing regulations

The SLF Sub-committee developed amendments to SOLAS Convention regarding safe return to port of a passenger ship after flooding casualty. The amendments were approved and adopted by the Maritime Safety Committee. The original proposal by SLF is presented in the Figure 3.

**ANNEX 4**

**DRAFT AMENDMENT TO SOLAS REGULATION II-1/8-1**

**Regulation 8-1 – System capabilities and operational information after a flooding casualty on passenger ships**

A new paragraph 3 is added after the existing paragraph 2, as follows:

**"3 Operational information after a flooding casualty**

For the purpose of providing operational information to the Master for safe return to port after a flooding casualty, passenger ships constructed on or after [1 January 2014] shall have:

- .1 onboard stability computer; or
- .2 shore-based support,

in accordance with guidelines developed by the Organization\*."

(\* ) Refer to the Guidelines on operational information for the Masters of passenger ships for safe return to port by own power or under tow.

**Figure 3 - A proposal of the amendments to SOLAS Convention by SLF**

The SLF Sub-committee requested STW Sub-committee to consider whether additional training of crew members assigned to duties with regard to this amendment were necessary. STW opinion was negative in this respect. This was a wrong decision and Costa Concordia accident did raise the need for additional training.

**4.2 Additional training that may be foreseen with regard to current discussions at IMO**

Piracy and armed robbery against ships is one of the top agenda items of the IMO. There is a great deal of discussions in the frame of this agenda item. One interesting issue is use of Privately Contracted Armed Security Personnel (PCASP) onboard ships and different aspects in this respect. From the MET point of view a very important question is: who is in charge – who commands such armed personnel? The Master is supposed to command and has overriding authority and responsibility. Figures 4 and 5 present respective elements of documents submitted to MSC.

**PIRACY AND ARMED ROBBERY AGAINST SHIPS**

**Safety issues related to the use of armed personnel on board ships in the high risk area**

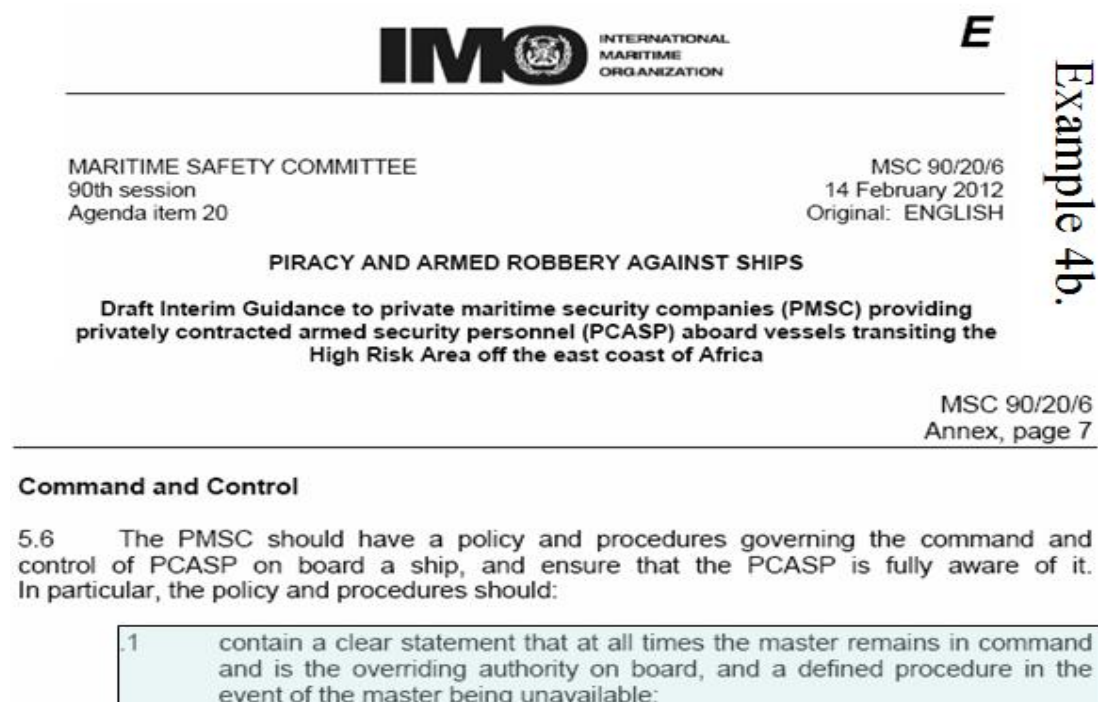
**Submitted by Italy**

<b>SUMMARY</b>	
<i>Executive summary:</i>	This document draws the Committee's attention to safety issues related to the use of armed personnel on board ships in high risk areas and describes the decisions taken by the Italian Administration in order to address such issues
<i>Strategic direction:</i>	6
<i>High-level action:</i>	6.2.1
<i>Planned output:</i>	6.2.1.2
<i>Action to be taken:</i>	Paragraph 10
<i>Related documents:</i>	MSC.1/Circ.1405/Rev.1, MSC.1/Circ.1406/Rev.1 and MSC.1/Circ.1408

**Introduction**

1 The series of countermeasures recently approved in order to reduce the risk of successful piracy attacks, includes the interim recommendations regarding the use of **Privately Contracted Armed Security Personnel (PCASP) on board ships** in the high risk area which address different aspects of the matter in relation to the parties concerned: shipowners, ship operators and shipmasters (MSC.1/Circ.1405/Rev.1); flag States (MSC.1/Circ.1406/Rev.1); and port and coastal States (MSC.1/Circ.1408).

**Figure 4 - Element of documents submitted to IMO with regard to PCASP**



**Figure 5** - The element of documents submitted to IMO with regard to PCASP

Current STCW Convention and STCW Code do not cover this issue. The Masters are trained in accordance with STCW Convention not necessarily have proper knowledge and skills to manage this problem while sailing in pirates' affected areas. Therefore appropriate amendments to STCW Convention are needed. IMO should start the discussion in this respect in the near future. Training centers (especially maritime institutions) should revise their programmes accordingly to cover the issue of commanding armed personnel onboard ships.

Szozda [7] UniMET paper raises several questions which we have tried to convey to the General-Secretary and his team at IMO. Sadly, the staff appointed to contact us did want to listen. These are some of the questions:

- How many other examples are there for improvements?
- Is it possible to create a Task Force out the structure of STW Sub-committee but dealing with issues mentioned above - a Project or a Taskforce?
- Call for a group of people aiming at holistic approach to amendments to STCW instead of "voluntary" submissions of Member States covering only particular parts of the Code that the subcommittees are interested in.

#### **4.3 Final Remarks - Areas of concern that IMO (STW) should consider**

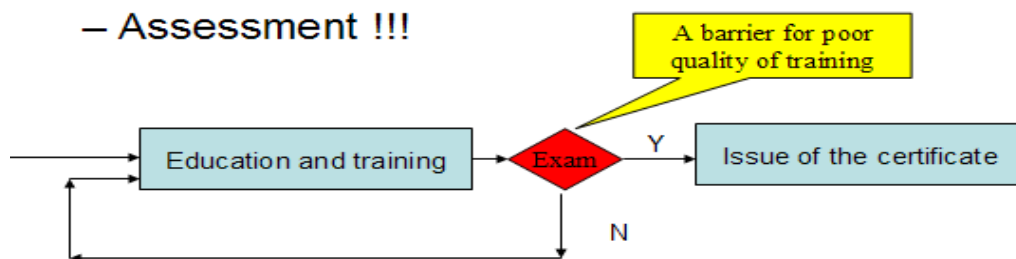
There are two main stages of seafarers' formation leading to obtaining the certificate:

1. Education and training.
2. Assessment.

If the purpose of the STCW Code is to facilitate formation of good quality (fit for purpose) seafarers, examination (assessment) should be the barrier for avoiding poor quality seafarers. While EMSA has taken compliance and assessment on board sadly IMO has passed this responsibility to national governments (Administration) without any processes for directly monitoring the compliance. Figure 6 shows the stage when an exam can act as barrier to poor quality (unfitness for purpose).

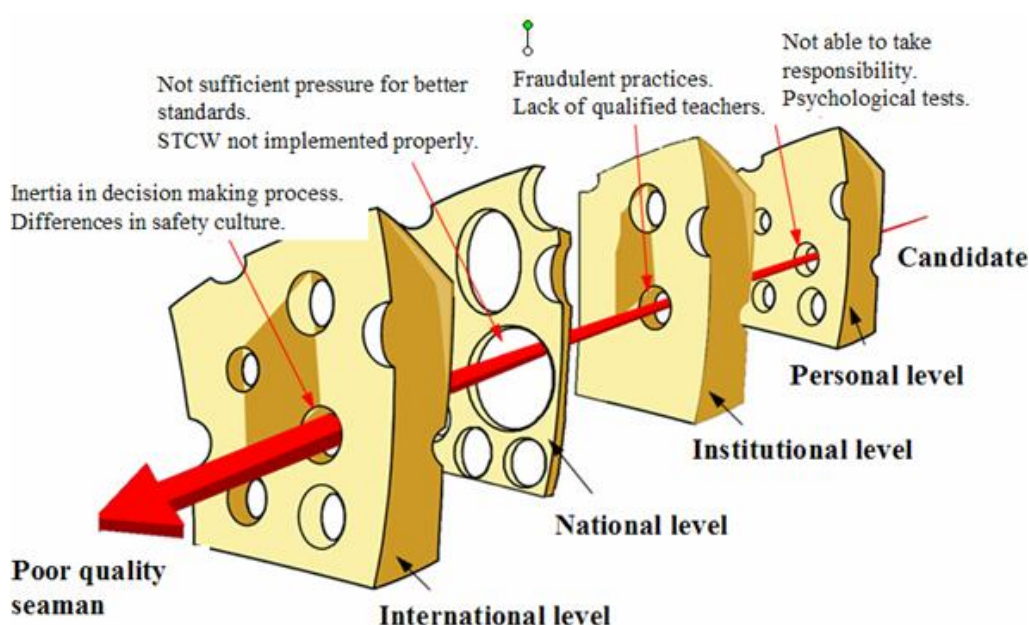
## Two main stages to obtain a certificate:

- Education and training.
- Assessment !!!



**Figure 6** - Exam as a barrier for poor quality seafarer

Figure 7 shows examples of possible barriers for avoiding poor quality seafarers (that has shown to have been breached on a massive scale – See EMSA’s report).



**Figure 7** - Examples of breached barriers that has led to poor quality seamen

The conclusions reached are summarized as follow:

The future aim for STW Sub-committee should be development of international standards for the seafarers’ assessment. IMO should work with EMSA to make the seas safer.

## Part 2

### 5. Harmonising the Maritime Education and Training- Removing Deficiencies at Source and Raising the MET standards: UniMET Story

It is important to explain the reasoning behind the development of the UniMET programmes. It is worth mentioning that UniMET programmes were based on an earlier successful Leonardo project called Safety On Sea [8] which supported Turkey to work with England, Scotland and Norway to develop maritime programmes and seek international recognition for them.

The UniMET programmes are composed of three distinct main programmes designed and developed for education and training of Deck Officers, Marine Engineering Officers and new type of officers

viz., Electro Technical Officers. Each main programme satisfies the respective IMO STCW 2010 requirements for the designated officer category and is supplemented with several IMO Safety courses such as fire fighting and so forth. There is a requirement for documented and assessed sea training for each type of officer. In addition the programmes are complemented two short courses Bridge Resource Management (BRM) and Engine-Room Management (ERM) which are now declared as mandatory and soon there will be a requirement for them to be incorporated in all ship officer education and training programme

Although there is only one set of standards for each type of officers as defined and described by IMO STCW requirements, the visit to several maritime education and training (MET) institutions as part of UniMET, clearly indicated that there are variations and each country (partner) has its own MET programme for each type of officers. A review of European Maritime Safety Agency (EMSA) reports also clearly shows there many variations in officer MET programmes and that there many programmes which fail to apply the STCW correctly, reporting serious deficiencies in some institutions. To this end, rather than unifying the MET programmes, a Generic UniMET set of programme for each type of officer was developed in conjunction with leading awarding, accrediting and licensing bodies in two maritime and leading countries (UK and Norway) and used to cross-reference each of the programmes with the respective partner programmes as well as with the IMO most recent Model course for each category of officers, benchmarking and testing the programme in real terms against the UK practice. This now allows several of set of STCW 2010 compliant programmes to be available to UniMET users and they also have a new complete and generic set to apply if they so wish to do so. In the generic model all pathways have been tested and programmes are accredited by major and well-know awarding bodies such as BTEC/Edexcel. The students and staff can apply for various membership, and professional designations, from chartered institutions such as IMarEST.

There are other benefits. Earlier investigations had reported serious shortfalls in the IMO standards themselves. It is pertinent to note that many of the reported deficiencies were taken into consideration in the STCW amendments in 2010. Making BRM and ERM mandatory was also a welcoming development. However, there are still areas of improvement. Referring to the recent report by UK delegation to IMO, there are serious concern about the lack of English Language competence by seafarers or the report concerning the increase in number of accidents/incidents due to increased level of automation on board vessels. The problem is that there is too much reliance on IMO and somehow there should be a realisation that there is a moral and also legal public liability which at least should make all concerned with education and training of ship officers to be more amenable to concerns expressed by leading maritime organisations, and the safety of public at sea and ports.

To overcome some of these the output of several EU funded projects were included in the UniMET Generic Programmes and partners were asked to review these projects and apply these, as much as feasible, in their programmes. One of these projects, **MarTEL** [3] provides a set of standards for seafarers English language competency. Some countries such as Holland may not need these standards, but many other countries welcome access to ready, available and reliable standards developed by leading English language specialists, researchers and maritime institutions and test the English language competency of their cadets, officers and senior officers. Projects **SURPASS** [4] and **MAIDER** [9] are a set of ship simulator and computer scenarios based on real accidents developed to overcome the automation failures and reduce emergencies at sea respectively. Both projects are expected to be launched in June 2013. Projects **EGMDSS SRC and LRC** [10] [11] already launched are excellent examples of e-learning and provide a complete course of education and training for GMDSS for each range. Project **TRAINS 4Cs** are mobility pilot courses designed and developed as part of UniMET project to test and evaluate UniMET Programmes in real life; any graduates cadet from the UniMET Generic Programmes can benchmark herself/himself with the UK standards and if successful obtain a UK Certificate of Competency and or an honours degree from a UK university. All pathways were tested successfully and several cadets from TR obtained their UK university degrees and other cadets obtained their Notice of Eligibility (NOE) from the UK Maritime Coastguard

Agency (MCA) and three cadets from TR are prepared for their Certificate of Competency (CoC) from MCA Examination and concluded their studies in February 2013.

**Master Class and Captains of Industry** - TRAINS 4Cs courses have identified several units of study which are considered essential if an officer would wish to progress to the Master Class. Master Class requires a major project for instance to be successfully undertaken satisfying the major chartered professional requirements for such degree unit of studies. The other specified units are essential for someone who aspires to lead well-educated and trained crew on board of modern vessels. It is also desirable for Captain of Industry wishing to take responsibility for a how fleet of ship have in-depth of research studies using scientific means in analysing report and investigation and reach reasoned arguments.

## 6. Conclusions and Questions

It is clear that a review of IMO conventions particularly STCW should be undertaken. Removal of inconsistencies would help to remove misunderstanding. The identification of gaps in the STCW should also be seen in a positive light.

IMO is promoting minimum standards and claiming that this is the wishes of its member states; but yet the same member states do not recognise each others' CoC or indeed other certificates, such for fire fighting, issued by countries other their own. IMO does not monitor standards, it only legislates. Interestingly, despite the power of legislation, it has not yet given itself the authority to dictate to its member states to accept each others certificates (CoC, and so forth)! EMSA monitors adherence to minimum standards set by IMO (STCW) in the EU/Europe and other countries visiting its ports. It has teeth and has used it effectively in several instances. However, they also have not so far promoted the concept of mutual recognition of certification in the Europe, even for those states with good record of compliance with IMO STCW.

One way of solving this problem is to raise the standard above current minimum set by IMO but ensuring that the minimum standards (STCW) requirements form the core of any revised standard. In a project recently funded by the EU, UniMET ([www.unimet.pro](http://www.unimet.pro)) an attempt is being made to streamline standards helping countries to accept each others' CoC and other auxiliary/safety/good practice certificates such as for fire fighting, BRM and so forth. The problem of recognition of certification in smaller vessels and yacht sector is even more acute (for more information see the attempts being made to get three EU member states, UK, Germany and Spain, accepting each others' certificates in these sectors at [www.trecvet.eu](http://www.trecvet.eu)).

IMO's only option is to abide by the wishes of their member states who often want the minimum standards. MET providers should accept these standards but seek excellence. The Marifuture, while being a European platform have no intention of excluding countries outside Europe; so if have been involved in developing/implementing a good practice you can join, irrespective of where you are on the globe. We have reviewed the IMO STCW and have identified its inconsistencies and its deficiencies - see our online e-learning platforms at [www.marifuture.org](http://www.marifuture.org). Review our publications especially our Development Papers. All our products are free of charge. Our intention is not to seek financial gains but to make seas safer at source. One major findings of our work is that the assessment system, leading to CoC, in many countries is in need of review, in some cases serious review. For this reason we are supportive of any form of external monitoring by professional institutions (specially those advocating peer assessment/accreditation) or agencies such as EMSA.

There are also many accidents due to linguistic problems. Should we not pay more attention to the English language competence level of seafarers? The research has shown that one third of all accident and incidents at sea and ports are due to communication and linguistic mistakes and mishaps (see [www.martel.pro](http://www.martel.pro)). IMO STCW clearly states that there should be effective communication on board of vessels yet does not set a meaningful standard to safeguard such an important requirement. Shouldn't



the national administration take language competency in English language more seriously? Do we have to wait for more accidents at sea due to this problem? Shouldn't IMO clearly state that English is the language of the sea? I do understand that it is the member states in the IMO that decide on such issues, but more effective leadership by IMO itself could reduce accidents and loss of life at sea.

## 7. Acknowledgment

The author would wish to acknowledge the contributions by Dr Martin Ziarati and Officer Ugurcan Acar to this paper.

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