Piecemeal Approach to Development of STCW and the Consequences – A Case for Comprehensive Review of the Current Maritime Education and Training Standards

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SUMMARY

A review of a recent research has shown that 25% of the world fleet are responsible for more than 50% of shipping accidents, while the top 25% of the safest ships caused just 7% of all accidents. Another study has reported that improving the quality of the world fleet to the same level as those of the safest 25% could lead to a 72% reduction in accidents. There has not been any investigation as to why some flags are found to be safe or why some are involved in more accidents.

This paper reports on the outcome of recent research works which point out the need to bring together the main stakeholders, such as IMO and EMSA, as well as the key sector innovators, in order to review the requirements of the shipping industry. The paper argues for a new set of standards for the education and training of ship officers and ratings.

Keywords: Maritime Education and Training, UniMET, Officer Class Standards, Master Class Standards

1. INTRODUCTION

1.1 CHALLENGES FACING MARITIME EDUCATION AND TRAINING

The human factor is the most important element in merchant shipping which directly affects the safety and security at sea. A well-educated and trained workforce is necessary for a strong and successful water transportation industry. Human factor also affects the competiveness of the shipping companies. The maritime education and training (MET) influences the quality of education of seafarers and their well-being in the future. Seafaring is an international profession and that is the reason why IMO established the common standards for seafarers' education and training. According to IMO (Ziarati, 2006) [1] 80% of accidents at sea are caused by human error. It is reported that mistakes are usually made not because of faulty, deficient or inadequate regulations, but because the regulations and standards, that do exist, have been ignored. The IMO accident analysis reports (cited in Ziarati, 2007) [2] clearly indicate that the causes of many of the accidents at sea are due to deficiencies in education and training of seafarers or disregard for current standards and regulations, as well as poor delivery of existing standards. A review of research (Ziarati 2007) [2] has identified several major deficiencies in the current international standards. There have been several serious attempts to overcome these deficiencies at source viz., at education and training stages (see for instance www.martel.pro; www.surpass.pro; www.maider.pro).

The industry is facing shortages of well qualified officers, primarily due to young people not choosing a seafaring career or leaving the career for land based jobs. Considering the age profile of the current seafarer nearing an average of 45, the solution requires a concerted and a radical approach by all concerned in the maritime community. The shipping industry needs to be an Industry of Choice (IOC) for the younger generation and, shipping companies recognised as Employers of Choice (EOC) in order to attract and keep the young people in the worldwide shipping companies (Cahoon and Haugstetter, 2008, sited in Kaptanoglu, 2009) [3].

2. WHY UniMET?

UniMET is not about unifying maritime education and training (MET). UniMET concerns the development of a unified system, consisting of several leading MET models, covering the whole range of practices observed throughout the world and identifying in parallel a number of good practices. The unified system would embrace the latest IMO and EU requirements and goes beyond the minimum standard set by STCW. The new system, known as UniMET, should provide a yard stick for organisations such as IMO and agencies such as EMSA to establish if STCW requirements have been fully implemented and if these standards have exceeded in any institutions, and to report if there are indicators to identify any areas where higher standards are applied. The UniMET system intends to:

Create a European Credit Transfer mechanism based on recent European agreements and realisation of European Credit systems for vocational elements of the MET.

Provide a simple but flexible and comprehensive learning time, facilitating the delivery of 4, 6 or 8 units per year. The system would allow for a range of variation as the overall credit for one year of study or training are based on current EU practice.

Place a greater focus on automation management and on emergency situations.

Support the development of a range of comprehensive sets of scenarios for emergency situations and included the applications of the automation system and components.

Provide a range of maritime English materials and a set of comprehensive maritime English tests, to ensure there is a measure to determine the level of competency of seafarers' command of the English language in the context of their profession.

Support the development of a set of e-learning platforms as examples of how these platforms could be developed for distant access to material that can improve safety at sea and make learning more user-centred.

Make the profession more attractive by developing tools which would help young people to work at sea and onshore through their career as merchant navy officers.

Initiate the development of a novel quality assurance system with a set of tangible quality criteria focused on the need of the learner.

Work in conjunction with leading awarding, accrediting and licensing bodies to ensure UniMET is recognised worldwide and UniMET qualifications are accepted throughout the world.

Since the UniMET programmes and courses are expected to be recognised worldwide, this would allow surpluses of workforce from one European country to work in others where there are shortages.~~;~~ Furthermore, ~~and~~ since there are pathways for seafarers to work onshore, this would make the profession more attractive to young people. Provision of online e-learning and e-assessment facilities would also make the seafaring profession more attractive and allow remote access a number of learning material.

There will be a clear distinction between officers graduating from universities (Master Class) and those from non-university institutions (Officers Classes 1 and 2). This would reduce the tension between the two distinct maritime education and training providers and that it would give the industry a choice to employ the most appropriate officers type for its needs.

It is worth pointing out that UniMET is supported by MariFuture (www.marifuture.org), a platform integrating innovation, education and research in MET and providing the latest development in Europe.

Last, but by no means least, is the development of PC based learning material, particularly scenarios developed around real accidents and incidents at sea for those institutions which have little or no access to bridge and/or Engine-room simulators See for instance MAIDER (www.maider.pro), SURPASS (www.surpass.pro) or EGMDSS (www.egmdss.com). MAIDER offers a range of ship simulator scenarios as well as PC based exercises emulating the ship simulator scenarios. SURPASS does the same for accidents due to automation failure at sea. The EGMDSS offers learning material and exercises for maritime communication. The UniMET partnership is proud to have developed a range of learning material for PCs in parallel to the development of materials for ship simulators

3. CHALLENGES FACING THE SHIPPING INDUSTRY

3.1 OFFICER SHORTAGES

There are acknowledged shortages of merchant navy officers, maritime business professionals and marine scientists and technologists (Ziarati, 2003) [4]. There are two ways of considering the shortages. One method is those predicted by organisations such as BIMCO/ISF. According to BIMCO/ISF (2005) [5], the additional number (estimated shortages) of merchant navy officers needed worldwide is 27000. The same report noted possible shortages reaching 46000 officers by 2015. The BIMCO/ISF estimated that the shortage~~s~~ of officers in 2010 were not dissimilar to the shortages reported in 2005 if different assumptions used by them are taken into consideration. A good review of shortages and OECD (Organisation for Economic Co-operation and Development) (2003) [6], figures are given in Ziarati (MariFuture project – www.marifuture.org).

The other method proposed by Urkmez (2005) [7] is by reviewing the tonnage for world maritime trade. OECD in 2004 reported the tonnage to be:

2001 Year	755.600.000 DWT
Sept. 2005	883. 900.000 DWT (%18)
Orders	231.000.000 DWT
2010 Forecast	1.100.000.000 DWT

Urkmez (2005) [7], relying purely on the number of ship orders and scrap (recycled) numbers, estimated the shortage of officers worldwide to be around 100000 and those by the Turkish fleet around 5000 by the year 2010. Urkmez (ibid) shortage figures are a great deal closer to Drewry Consultation shortage figure of 83000 for officers as quoted by the previous President of IMO, Mr Mitropoulus, in 2009. Turkey has a massive surplus of ratings and a shortage of officers, particularly Marine Engineers (OECD, 2003) [6], This means that the manpower resources in this sector needs to be corrected by producing more officers and giving opportunities to some Ratings with the potential to receive additional education and training and become officers. Such opportunities have already been built into UniMET system through clear pathways developed as a part of an EU funded project (SOS, 2005-2007) (www.maredu.co.uk) . However, the massive increase of maritime faculties and courses has to a large extent redressed the balance in Turkey. This shortage situation was particularly remedied by TUDEV Institute, private company in Turkey, recruiting some 1000 cadets over a three-year period, 2005-2008, becoming the largest centre for officers education and training in Turkey. The success was the external recognition of TUDEV programmes by leading awarding, accrediting and licensing bodies in Europe.

It is pertinent to note that the predicted officer shortage figures had to be reviewed due to the start of the ongoing economic crisis in 2008. However, despite the crisis there are still significant shortages of officers in many countries. What is significant, is that the methodology adopted by Urkmez (2005) [7] to predict officer shortages which purely basis the officer requirement on existing number of vessels (includes new orders and those vessels assigned for re-recycling).

This methodology has shown to predict the number of seafarers required in the future well, but at time of crisis, the results obtained by applying such a methodology should be complemented by a more sophisticated methods for example developed by researchers such as Akdemir et al (2007, 2010), [8] [9], applying sophisticated artificial intelligence technique to predict demands for different types of vessels in the future.

3.2 PREVIOUS RESEARCH

It was also noted that there have been several research reports which have pointed out that while some countries are applying good practices, there are those that need support. A study by (Torkel, 2004) [10] reports that 25% of the world fleet was responsible for more than 50% of shipping accidents around the world. The study notes that the top 25% of the safest ships were involved in just 7% of all accidents. The University of Technology and Science in Norway (Ziarati, 2003) [3],, reports that by improving the quality of the world fleet to the same level as those in the safest 25% category, there might be an overall reduction of 72% in shipping accidents. These research works were the basis for the developing the SOS (2005-07) project which underpinned the development of the on-going UniMET programmes. SOS project consortium included a leading MET institution from Norway (Tromso).

3.3 IMO STANDARDS

The current international Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) was recently revised and a good review of the changes is given in Yongxin (2010) [11] (sited in Ziarati 2010 – See www.marifuture.org development papers, October 2010). These standards are the minimum level of education and training for seafarers worldwide. While minimum standards should be respected, what is needed is to aim for higher standards and seek excellence rather than embrace the lowest possible standards. This is in fact what many MET institution have done and UniMET seek to obtain the recognition for their additional effort and make sure that there are aware of MET deficiencies and good practices that exist to overcome some of the identified gaps in MET hence giving them the opportunity to review and revised their programmes other those introduced by IMO in 2010.

Another regulation that will effect maritime training is new international Maritime Labour Convention adopted in Geneva on February, 2006 and its recent revision in 2012. It is considered as the fourth pillar of international maritime regulation; the other three being the conventions on Safety of Life at Sea (SOLAS), MARPOL and the STCW which is related to seafarers' knowledge, skill, and competence minimum requirements.

3.4 THE TWO MAIN PROBLEMS

There are several challenges facing MET providers and those who use their products and services. However, the two main problem areas concerning the seafarers in Europe are the shortage of seafaring officers and the quality of MET. Much efforts has been put into finding solutions to the shortage of seafaring officers; amongst the solutions was the emergence of many new maritime institutions and the expansion of existing resources. In countries such as Turkey, Bulgaria. The number of seafarers being deployed in Europe is increasing significantly. Although officer shortages still continues to be a problem in some of the Western countries, the significance of this problem area is gradually receding in

Eastern Europe. Nevertheless, the quality of MET is still a major issue. Here, quality means fitness for purpose and the need to ensure quality is fit not by the administration or institutions for saying so, but through peer assessment such as external accreditation of MET programmes by professional institutions or awarding bodies. If the quality issues are resolved in identified regions of Europe then there will be countries in these areas that will help create a bank of European seafarers available to help overcome shortages in other regions of the Western world.

3.5 EUROPEAN QUALIFICATION FRAMEWORK

The global maritime community has become very keen on vocational qualifications. These qualifications have become an important subject to be visited and reconsidered not only by Western countries but also by the others globally. The European Union (EU) has established the (European?) Qualification Framework (EQF) and all members and cooperating countries have started to adopt this system in their national occupational framework. The main aim of the EQF is to ensure that the quality of manpower in the industry is the same throughout Europe. EQF establishes standards for a safe, secure and productive work environment.

Europe needs to fully embrace ~~by~~ what is necessary to create a MET system that is fit for its purpose. Not all seafaring officers need to be university graduates and at the other end of spectrum we need seafarers with higher qualification beyond university diplomas and degrees.

3.6 EUROPEAN MARITIME SAFETY AGENCY

Whilst IMO legislates and introduces standards such as STCW, it has not and probably would not monitor the implementation of its own minimum standards. The IMO has a huge inertia and often been reactive to shipping industry's needs. It has passed the responsibility for implementing and monitoring of its standards, rules and conventions to the national governments. The problem is that the IMO established the STCW after several major accidents, SOLAS and MARPOL, also came about after major accidents. The core of STCW was developed in 1978 and since then there have been several cosmetic changes to these standards, the most significant being the one in 2010, and many of the other changes being forced upon the IMO by larger and more progressive companies canvassing through several national government delegation to the IMO committees. Although the number of accidents and incidents at sea are on the decrease, the number of accidents and incidents due to automation failures have been on the increase and those due to communication errors and linguistic problems have remained substantial Trenkner, 2002) [12], Ziarati et al (2010a and 2010b) [13] [14]. Intertanko recently reported (SAS 2010) [15] to experience one engine stop per week; this is one accident per week waiting to happen for Intertanko alone; one accident too many!

European Maritime Safety Agency (EMSA) was established to ensure safety at sea throughout the Union and further afield. One area of focus for EMSA (2003) [16] has been the enforcement of STCW throughout Europe and in countries providing seafarers to Europe or visiting Europe's waters or ports. EMSA is involved in the application of EQF standards in the maritime sector and has, as stated earlier, started to inspect and evaluate the quality of the MET in member and candidate countries.

EMSA made a detailed study on the MET systems in 2010 and submitted a report to EU countries and ship-owners about the findings of this study. It is clearly stated that some countries are not able to meet STCW standards and seafarers from these countries are not eligible to be employed on board EU ships. For instance, Certificate of Competencies (CoC) issued by Georgia are refused. Another example is that the EMSA formal request for the closure of 12 MET institutions in the Philippines which were found to be sub-standard unless they improve their quality. There have also been quality issues with several EU member states.

Not only the EU member states but also a number of developed countries such as the US, Canada and Japan are very keen on stamping out on the low quality seafarers. There is no employment opportunity for the foreign seafarers in these countries unless they have a guaranteed high level of competency standards. They, similar to EMSA, are directly involved with the MET systems in the countries which provide seafarers to them and cooperate with them to ensure the quality of the standards are as expected.

3.7 TECHNOLOGY CHALLENGES

The new technology encourages/allows us to use Pseudo and real simulation systems. The excessive use of simulators is strongly advised by STCW. Use of simulators requires adequate equipment, highly experienced instructors and well-designed scenarios. A campaign has been started to upgrade existing simulator systems which will fully support course programmes. CBT (Computer Base Training) and CBTM (Computer Base Training Assessment) have become essential elements of the MET to provide more realistic training for cadets and seafarers working in the maritime industry. The computer assisted systems have been also deployed to create new scenarios and undertake research studies in support of the maritime industry. Some of the

developments by MariFuture partners are projects (SURPASS, MAIDER, EGDMSS, CAPTAINS (www.captains.pro), Sail Ahead (www.sailahead.org), IMPACT (www.impact.pro) and UniMET.

It is recognised that not all MET institutions have sophisticated bridge and Engine-room simulators and those that do have some have limited access to them. The real problem is that none of the simulator exercises observed in many of the visits is based on real accidents or incidents, these include some of the leading maritime authorities whose awards, or their certificates, are used as the basis for CoC/OOW qualifications. It seems that many of the tests are based on exercises rather than real accidents or incidents. Furthermore, many of these examiners have not worked as seamen for substantial number of years. It was for these reasons that the several major EU projects were initiated, as outline in the previous paragraph, to overcome both technology related problems viz., lack of realistic scenarios for simulators and also finding a way to increase access to simulators.

4. THE SITUATION IN EUROPE

Ignoring the current economic crisis and considering the trends, the European fleet is growing rapidly and the shortage of qualified seafaring officers is estimated to be over 30,000 in the next 5 to 10 years. The shortages reported in BIMCO/ISF reports of 2005 and 2010 are not that dissimilar Enforcement of ISM and ISPS applications forced ship owners and the Government to take rapid measures to review their ship management applications. The emergence of high value and modern ships in service had necessitated an urgent need for qualified seafarers to service the European maritime industry. As reported earlier there are also severe shortages for qualified seafarers, particularly relating to specialised vessels.

The provision of high standard qualifications for seafarers is important not only for the EU domestic demands, but also for external demand. Europe has a huge young populations, and the economy cannot provide sufficient employment opportunity for the continent's young people. There are European countries which have considered export of manpower as a serious opportunity to solve the unemployment problem (DfT, 2009) [17]. The world shipping sector is a ripe employment area well suited for exploitation by the some of the European governments and the maritime Communities to create employment opportunities for their young unemployed people.

5. UniMET PROJECT

Europe needs knowledge and resources to participate in or initiate many innovative projects in the maritime field. Considering many of these projects involves cooperation with EU bodies and similar maritime centres in other countries, the continent needs to trigger the exchange of information and knowledge between European countries and worldwide.

Following many studies, in coordination and cooperation with several European Countries, and a number of visits to MET institutions in Norway, England, Scotland, USA, Sweden, Finland, Poland, Slovenia, Lithuania, Bulgaria, China, Japan and several other countries reviewing the variation in MET practices it was realised that there is a need for harmonising the these differing approaches. The review of maritime practices in these countries concluded that the existing provisions in Europe, while in many aspects are satisfactory and that there are pockets of excellence in several noted practices, overall it was short of what is required and existing maritime institutions needed to rapidly increase their current capacities and improve their provisions to standards expected by international and European research, awarding, accrediting and licensing authorities.

In addition to the monitoring and evaluation system at national level, European countries have accepted EMSA (European Maritime safety Agency) inspections. EMSA has conducted inspections on many maritime administration systems of many EU and non-EU countries in particular on education, training and certification systems. A review of EMSA's reports clearly shows that there are a range of differences and practices in implementing the IMO minimum standards for maritime education and training (STCW) in the various countries. EMSA also focuses on minimum standards.

The EMSA's report indicates some deficiencies regarding the MET systems in several countries and refers to some of the actions taken by the administration and/or institutions to correct these deficiencies. The reports state that most of the deficiencies regarding maritime training, certification and monitoring which were indicated in the previous visits were subsequently seen to be correct in the second or subsequent visit(s). While EMSA should be commended for trying to monitor the IMO STCW, as a European safety agency it should focus on any means to improve the safety of ships at sea. There areis always more than one party involved in accidents and incidents and on this basis EMSA cannot and should not ignore the quality of MET in other countries with ships passing through its waters and visiting its ports, while at the same time be pro-active and progressive in predicting future needs, through reviewing and/or promoting research work to promote safety at sea and ports.

The main question raised by the research reported in this paper was how and why there are so many differing MET practices particularly when considering that the core of these practices is satisfying the IMO STCW and related requirements. A review of the MET in several European countries indicated that there is a possibility of harmonising the MET programmes and developing a unified system for presenting several models for consideration not only by European countries, but by all IMO member states. The core of the harmonised MET is the latest STCW and the IMO revised Model courses supplemented by several good practices noted in partner MET insitutions. To ensure there is a harmonised MET practice UniMET proposal was drafted and submitted to the EU for funding**.**

An overview of the UniMET project is presented in Figure 1. The unit structure is flexible and the UniMET Credit Transfer Scheme is based on current practice in the EU. Table 1 shows the credit system within the EQF. The pathways for Officer Class l to 2 and to Master Class and Captain of Industry are also set as shown in Tables 2 and 3. Table 4 shows the UniMET corresponding ECTS and ECVET and Variation of Number of Units in a year. The Top-up system show Tables 2 and 3 are 2+1 or 3+1 schemes; so that cadets from one institution could at certain points exit the system and if they wish study in one of the UniMET partner institutions or go to sea and return or continue their studies at higher level.

6. UniMET COMPONENTS

UniMET does not just try to unify the MET but also addresses several known deficiencies, many also identified by IMO sub-committees themselves. The paper here only refers to the current map of UniMET which includes tools such as Sail Ahead (www.sailahead.eu) which has its own online guidance helping seafarers to find jobs onshore. UniMET is underpinned by a comprehensive set of learning and teaching tools and resources such as MarTEL (www.martel.pro), CAPTAINS (www.captains.pro), SURPASS (www.surpass.pro), M'AIDER (www.maider.pro), EGMDSS (www.egmdss.com). Readers are recommended to refer to these projects' websites. Two of the elements are worth further mention here. One is MarTEL and the other is SURPASS. MarTEL was a response to the UK proposal to the IMO MSC (2006) meeting stating that 'there is a compelling need to promote a high level of working maritime English language skills'. The SURPASS project was initiated after the UK delegation raised the problem 'that the human operators rarely understand all the characteristics of automatic systems and that these systems' weaknesses and limitations have now been found to be the main causes of accidents'. The Project concerns a complete on-line course in ship automation with a set of simulator scenarios based on previous accidents and incidents. In parallel the same set of ship simulator scenarios has been transformed into PC-based scenario exercises.

6.1 MarTEL

MarTEL is a set of standards for Maritime English. The proposed standards are expected to make seas and ports safer and save lives, and to improve the quality of life on board vessels through improved communications. The standards include three assessment phases, ranging from Elementary to Upper-intermediate/Advanced in Phase I, English Tests for given skills for Deck and Marine Engineering Officers of Watch in Phase II and English Tests, again for given skills, for Senior Deck and Marine Engineering Officer in Phase III.

MarTEL is not a tool set to solve problems but a pro-active approach to avoiding problems in the future, hence a Newtonian approach. It overcomes the limitations of SMCP and removes the need to use standards such as ILTS or TOEFL as these are not designed for seafarers' requirements. Unlike ILTS or TOFEL, MarTEL is a vocational approach and relies on the languages skills needs of different types and ranks of seafarers.

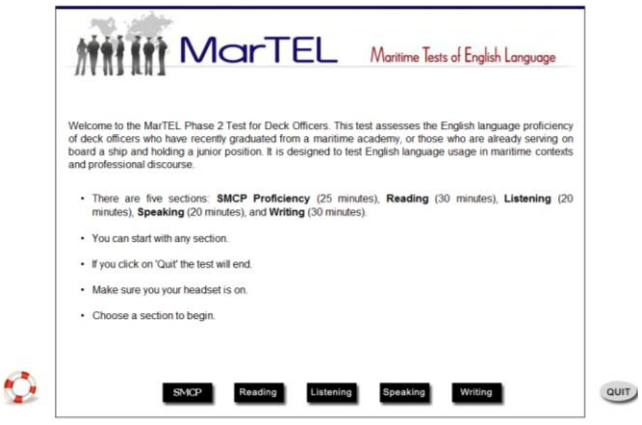

Figure 1 - Start Scheme for Phase 2 Deck Officer Test

MarTEL, abides by the findings of an earlier EU funded Leonardo pilot project that there is no language called 'Maritime English' and that competence in English Language is only attained if developed in the context of English language. Maritime English is the vocational element of the English Language for seafarers and should be treated as any other ESP (English for Special Purposes). This concept agrees with findings of arguments presented by Loginovsky (2002) [18]. MarTEL also clearly identifies the English Language

needs of each type and rank of seafarers, setting English proficiency levels at three different phrases. MarTEL [19, 20]. embraces SMCP and incorporates additional content which has been emanated from the study of some 700 accidents. MarTEL, places less reliance on conventional English Language tests such as IELTS, TOEFL, etc. The latter standards are developed for academic studies. Most Merchant Navy Officers come through vocational routes. Furthermore, IELTS, TOEFL do not distinguish languages skill needs, of different types and ranks of officers and they do not embrace SMCP. One very important attribute of MarTEL is that it is about the Maritime Test of English Language and not English Language test of Maritime knowledge. MarTEL, takes the arguments of all scholars and researchers in the field of English language competency requirements at sea. The development of MarTEL Standards necessitated the views of Catherine Logie (2007) [21] to be taken into consideration. She is of the opinion that Maritime English training at METs lacks the following:

- Time allocated to Maritime English
- Up-to-date resources integrating Maritime English content with the Communicative Approach to language training.
- Time to develop practical skills of listening and speaking (with priority given to learning terminology).
- Exam systems evaluating spoken competence.
- A standardised qualification for Maritime English trainees and trainers.
- Opportunity for Maritime English trainers to update their knowledge of both subject content and methodology.

MarTEL, offers Test at three different levels/phases:

- Phase 1 - Upper intermediate/Advance
- Phase 2 - Officer of watch – Deck
  Officer of watch – Marine Engineers
- Phase 3 – Senior Officer – Senior Deck
  Senior Marine Engineers

Each phase contains a standard (test) supported by a set of study guidelines and each having a series of study units, language skills and skill levels for each type and rank of officers. In Phases 2 and 3 these skill needs are clearly identified which are based on the outcome of some 700 accident investigations. Each phase has been tested and evaluated in several countries involved with the MarTEL project. The outcomes of the EU funded MarEng (2005-07) [22] has been included in the MarTEL study units and the findings of MarEng Plus (2008-10) [23] have also been included in MarTEL standards.

There have been several papers and workshops on MarTEL since the project commencement; a list of these is given in the bibliography part of the references at the end of the paper.

MarTEL Plus project (2010-12) [24] makes an attempt to overcome the problem of not having international or European standards for Maritime English for Ratings. So the project is very similar to MarTEL but this time developing standards for Non-officer Ranks. MarTEL plus also attempts to improve the quality of MarTEL standards for Cadets, Officers and Senior Officers by providing Speaking tests and making these tests more sustainable and in parallel improve the validity of the tests for all phases of MarTEL.

6.2 SURPASS

The main aim of this project was to fill the gap created as the result of emergence and application of the automated systems in the education and training of seafarers by provision of a training course enabling them to have a full understanding of automated systems, and these systems' weaknesses and limitations. To achieve this aim it is necessary to identify the training needs and develop or adapt methods and methodologies both for content development and the delivery of the modules within the course. SURPASS included a well-planned literature review of both the automated system and components, and the accidents and incidents, such as that by Savannah Express (2005) or the sinking of Glorious (2007) in the Bosphorous, are carefully and meticulously carried out. The former accident was due to engine failure and the latter due to navigation (steering, rudder) failure. Emergencies at sea are rare. However, when they do appear they could cause loss of life and material damage, therefore seafarers not only have to learn how to operate automated systems but should regularly be refreshed in order to ensure the safety of the crew, passengers and/or cargo.

The second aim was to make courses being developed under this initiative also available to industry to ensure companies in the sector**,** particularly ship operators and ship builders, are aware of the support these systems require and operational features as well as their management. This aim is expected to make the companies more competitive and reduce loss of life and personal injuries as well as substantially reduce the cost of accidents and incidents.

The third aim was to adapt e-learning and e-assessment systems and use Internet as a means of communication within the target groups as well as for training material delivery and its assessment. There will be two types of

assessment. One as part of the learning strategy so that self-assessment and trainee-centre-learning and inquiry methods could be used to enhance learning; and the second is an assessment which is designed to measure performance evaluation and for progression purposes.

7. CONCLUSION

UniMET is not just a set of harmonised MET programmes. It supports IMO STCW and offers two new set of standards, Officer Class 2 and Master Class. UniMET also promotes a new classification of officers with postgraduate including PhDs as Captains of Industry. It is an entire and comprehensive MET practice with its own unique and innovative quality assurance and control system derived from best practices in the world. It contains its own online platform with several variations of MET programmes all harmonised around the IMO STCW and in line with IMO model courses. What is also significant with regards to UniMET is its whole suite of good practice courses, all with their own online, yet independent, platform. It was developed after reviewing all previous projects and attempts to unify MET programmes or practices in Europe and worldwide. It came about as a result of several major research and development projects followed by over twenty visits to many countries and their MET institutions.

Sail Ahead is expected to make the profession more attractive to young people. Furthermore, a future map (including a sustainability plan) has been developed for UniMET and work has already commenced to realise the next stage of its development. One area is to bring the less privileged seafarers ~~also~~ into the scheme of UniMET~~,~~ and therefore work is currently being carried out to provide similar opportunities to Ratings and giving some of them the opportunity of becoming officers. There are also projects which will link up with UniMET to identify current good practices and ensure their outcomes are disseminated and incorporated into UniMET. UniMET and every individual element of it has already been tested in real environments and many of its constituent~~s~~ parts are being used worldwide. There are clear indicators that UniMET and its good practices will receive international recognition. The first UniMET product which is the online GMDSS (www.egmdss.com) has already over 40000 registered users. The UniMET courses have been sent to awarding and accrediting bodies and the outcome has been provisional approval for each one. The UniMET and its products such as MarTEL for instance have been accredited by a number of universities in the UK. A pass in MarTEL Phase 1, on provisional basis, has been to satisfy the English language competency requirement by UK Boarder Agency and some Universities in the UK and several cadets have been enrolled on the final year of Plymouth Universities Marine Sciences honours degree programme. Some of the Turkish cadets have also obtained MCA's NOC's and one obtained his MCA CoC and Officer Watch certificate. There are currently several cadets at Glasgow City College on their Post-HND programme and are being prepared for MCA CoC examination. The intention is not to seek MCA's CoC for all cadets in Turkey but to benchmark some of the MET provisions with the Gold standards set by a leading licensing authority such as the UK's MCA.

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He previously served as Director of Oxford Brookes University/Dogus Institute, Istanbul, Turkey, Dean of Faculty of Sciences, Head of Department of Computer Engineering and Pro Vice Chancellor (External Relations) of Dogus University, Executive Director of Centre for Factories of the Future, External Examiner for higher degrees, degrees and BTEC/Edexcel programmes.

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He has written a number of International referred papers in the area of Maritime English. He has also had written a number of articles printed in International maritime publications in the area of Maritime Communications. He is a member of the Excellence Club, represented by leading innovative companies in the region and a personal member of the EU Research and Development funding group, both established by the regional development agency.

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Figure 2 – UniMET Framework

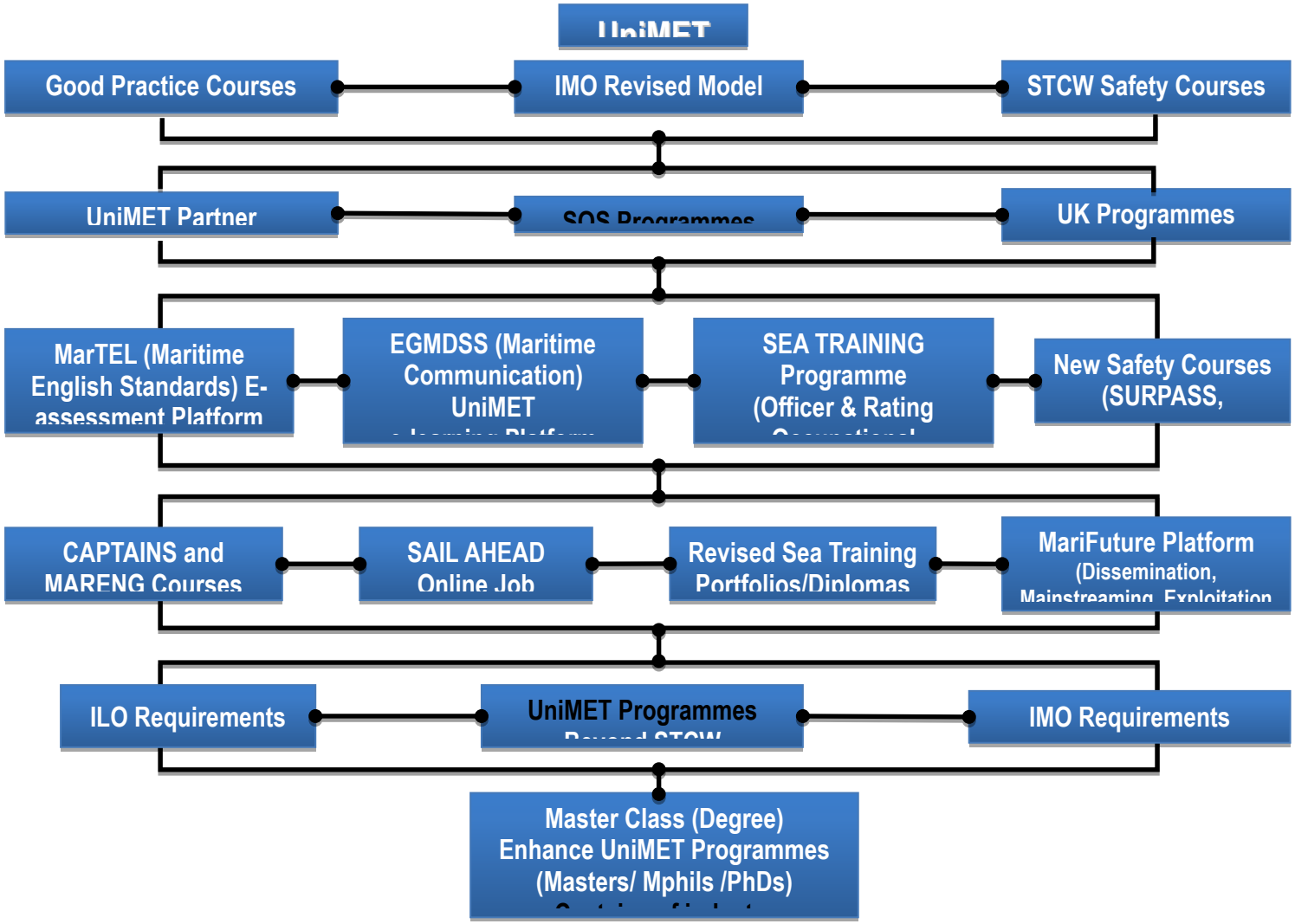

Table 1 – UniMET Credit Transfer System

LEVEL	TIER	CREDITS
Captains of Industry	LEVEL 8 LEVEL 7 (EQF)	4 years – 240 ECTS 2/3 years – 120/180 ECTS per year
Master Class Semestr 1 - 5: School Semestr 6&8: Sea Tra. Officer Class 1(7.03/4) Semester **7** (Additional Units for degree) Officer Class 2 (7.01/2)	LEVEL 6 (EQF)	3 years at school - 180 Credits 1 year at sea (Deck,ME) 60 Credit TOTAL 240 ECTS
Officer Class Master Class Semester 1 - 5: School Semester **6 &7**: Sea Training Officer class 1	Level 5 (EQF&	2 ½ years 150 ECTS 1 year at sea (Deck+ME) 60 CVET/ECTS ½ years 30 ECTS (See slide 3) for degree and 7.01/7.02 education
Vocational School Limited Officer	LEVEL 4 (CVET)	3 /4 years 120 or **160** CVET For each month at sea 5 CVET

Table 2 –Additional Units for Master Class (Degree)

No	Unit	Hours	Credit
1	Marine Project DECK&ME)	**250 (100 hours during Sea Training)**	**12 ECTS**
2	Marine Management, Finance and Law **(DECK&ME)** (Management Level)	**125-150**	**6 ECTS**
3	**DECK** Advance Navigation and Watch for Managemant Level **ME** Advance Marine Engineering for Management Level	**250-300**	**6 ECTS**
4	**DECK** Marine Operations (Cargo and Passengers) Marine Industry Applications **ME**(Maintenance&Technology)	**250-300**	**6 ECTS**

Table 3 – Additional Units for Master Class (Top up)

No	Unit	Hours	Credit
1	Marine Project DECK&ME)	270	**30 ECTS**
2	Marine Management, Finance and Law **(DECK&ME)** (Manegement Level)	90	**10 ECTS**
3	**DECK** Advance Navigation and Watch for Managemant Level **ME** Advance Marine Engineering for Management Level	90	**10 ECTS**
4	**DECK** Marine Operations (Cargo and Passengers) Marine Industry Applications **ME**(Maintenance&Technology)	90	**10 ECTS**

Table 4 – UniMET ECTS and ECVET and Variation of Number of Units in a year

NB:1 Officer Class 1 (Equivalent to IMO 7.03 and 7.04)

Officer Class 2

1 Year = 8 Units of study.

1 unit = 7.5 Credits

Each Unit = 60 hours of learning (Nominal)