Thematic Network on Maritime Education,
Training and Mobility of Seafarers
METNET
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Final Report for Publication

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Table of Contents

1 EXECUTIVE SUMMARY

This EXECUTIVE SUMMARY is divided in three parts:

- Why METNET? The main objective and aims of METNET.
- Who participated in, and did the work for, METNET?
- What did METNET achieve? The results of METNET.

The latter part is sub-divided in Recommendations, Tangible results and Limitations of METNET.

In a wider context, the need for METNET has arisen from the consequences of the incomplete match of objectives and realities between national MET and international shipping, between maritime human resources in EU countries and a global maritime labour market, between national societal circumstances and international economic necessities. Resulting differences from this situation can hardly ever be fully reconciled, not even by continuous appropriate efforts. A passive national attitude to the effects of an already existing globalization in shipping would however have grave consequences for the national maritime labour market, both quantitatively for the number of jobs for EU nationals and qualitatively for the competence and the competitiveness of maritime services in EU countries.

Why METNET? The main objective and aims of METNET

(chapters 3 and 4)

The main objective of METNET, the Thematic Network on Maritime Education, Training ad Mobility of Seafarers, was to find and exploit ways and means to use maritime education and training of ship officers (MET) as much as possible for halting and eventually reversing the trend towards the European seafarer becoming an "endangered species". The core of this objective is the sustainability of competent and competitive maritime services and of the necessary maritime skills base in the EU, especially as education, training and shipboard experience of ship officers are also needed in the maritime sector ashore.

The specific aims of METNET were to improve the quality, harmonize the contents and extend the applicability of MET.

Improved MET quality will help to increase the attractiveness of maritime careers, increase the potential and value of ship officers and ex-ship officers in the maritime labour market, create more jobs for EU nationals and make EU shipping safer, more environment-friendly and more efficient.

Harmonized MET contents will help to develop the basis for a future European ship officer, improve his/her intra-EU mobility, extend the mutual recognition of ship officers certificates and facilitate cooperation between MET institutions.

Extended MET applicability will make a career as ship officer more attractive. It will help to meet the existing demand in most EU countries for national ship officers by increasing the supply – which will also ensure the number of former ship officers who are required to take up positions in the maritime industry ashore.

METNET did however not only aim at improving, harmonizing and extending MET but was also concerned with the conditions and the environment in which MET operates, such as the costs and financing of MET, national data bases on seafarers, recognition of certificates of competency and intra-EU mobility of seafarers.

Who participated in, and did the work for, METNET?

(sub-chapter 5.3)

The core network of METNET was the consortium. It comprised representation of all stakeholders in MET, i.e. of MET institutions, shipowners' associations, seafarers' unions, maritime and education administrations, professional associations, universities with maritime programmes and maritime research institutes, ICT (Information and Communication Technology) companies. The extended network included additional representation of MET institutions and of governmental administration of MET in Reference Groups which brought the number of involved countries to 16 (Belgium, Denmark, Finland, France, Germany, Greece, Iceland (only MET institution), Ireland, Italy, Netherlands, Norway, Poland, Portugal, Sweden, Spain, United Kingdom). A pan-European network was created by the involvement of MET institutions and maritime administrations from East European and Mediterranean accession countries (Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovenia and Cyprus, Malta, respectively) and non-accession countries (Croatia and Egypt, Israel, Morocco, Turkey, respectively).

Altogether, 29 countries were represented and participated in METNET.

What did METNET achieve? The results of METNET.

(chapters 5 (except 5.3), 6, 7 and 8)

METNET produced 34 deliverables in the form of syllabi, courses or reports for the 14 work packages and their tasks, 3 special reports (including this one) and numerous recommendations and proposed follow-up actions for the implementation of the recommendations.

Recommendations:

The recommendations are divided in recommendations on the recruitment (supply) and the retention of seafarers, on improving the quality and employability of seafarers, on facilitating the intra-EU mobility of seafarers and on the involvement of accession countries.

The recommendations could also be divided in recommendations for developing METNET activities further and exploiting MET more than until now for ensuring the sustainability of the EU maritime skills base and in recommendations which ask for contributions from other stakeholders to help meet the main objective and the aims of METNET.

The gist of the first three groups of recommendations is the following:

Recruitment (supply) and retention:
All stakeholders in MET should - in a joint effort – actively participate in national and EU efforts and in awareness and promotion campaigns to make seafaring more attractive (recruitment). Ship owners/ship operators should make shipboard life and work more attractive (retention).

Quality and employability:
MET institutions should – also by using METNET results - further enhance the quality and employability, competence and competitiveness of seafarers and maintain the momentum created by METNET. They should make better use of modern ICT (Information and Communication Technology) and optimum use of national MET resources, the latter being mainly a task for national maritime and education administrations.

Intra-EU mobility:
MET institutions should make intensified efforts to foster intra-European mobility of ship officers by furthering the development and use of more comparable MET programmes and introducing the European Credit Transfer System as well as by intensifying inter-institutional activities of students and staff. Responsible administrations should make the necessary efforts to remove legal, administrative, fiscal, social etc. obstacles to intra-European mobility of ship officers.

Policy decisions on optimizing MET systems and improving MET standards should, in the framework of politically defined national objectives for the maritime sector, be taken by "national roundtables" of all stakeholders in MET.

Accession countries should be involved in future efforts to sustain competent and competitive national and European maritime skills bases.

Tangible results:

MET quality can be improved by raising the quality of the four main elements of national MET systems:

students, staff, programmes and facilities.

Obviously, a better quality of MET graduates is a consequence of a quality enhancement of the other three elements. The latter can also be expected to result in the application of more students with good higher general education achievements.

Identifying (as below) the main relationships between the four main elements of MET systems and the four main environmental influences on national MET –

economics (industry), regulations (administration), society (individuals), technology –

shows that programmes are related to all four main environmental influences and offer therefore a promising approach to improving MET quality. Nevertheless, maritime lecturers remain the "change agents" and programmes are their main tool to bring about change and to change themselves.

	economics (industry)	regulations (administration)	society (individuals)	technology
students	x		x	
staff	x	x		x
programmes	x	x	x	x
facilities				x

Main relationships between main elements of, and main influences on, MET

METNET has developed exemplary syllabi and courses for students which will benefit the industry and the individual, respond to changes in international regulations, make MET more attractive for potential applicants and provide for a better exploitation of modern technology by MET.

METNET has also developed courses for teaching staff for a more effective use of modern technology at MET institutions.

In detail, METNET has developed syllabi for students and lecturers at MET institutions for

- **marine engineering MET,**
- **nautical MET, and**
- **dual-purpose (marine engineering and nautical) MET;**

and courses for students and lecturers on

- **marine environment protection,**
- **port operations and costs,**
- **shipping operations and costs, and**
- **celestial navigation;**

and English language back-up material for the first three courses.

These syllabi and courses help improve the quality of MET, harmonize the contents of MET and extend the applicability of MET. They are also to serve as examples and impetus for a critical review of existing programmes at MET institutions and their updating. They are to help to make the rather static MET syllabi more proactive by

increasing attention to both the industry's and the individual's expectations and needs. MET has to see to it that its graduates have maximum market value in the maritime sector, are enabled for, and committed to, life-long learning and should, consequently, have minimal difficulties to find employment.

METNET has also developed courses for lecturers for improving their knowledge and skills in the use of modern technology. These courses are on

- **the application of modern technology in teaching,**
- **the application of modern technology in assessment,**
- **the optimum use of shiphandling/navigation simulators, and**
- **the optimum use of engine room simulators.**

Moreover, METNET developed and used the 4E concept of MET for facilitating communication on MET systems and standards. The four Es of the concept are:

- **ESSENTIALS (minimum requirements of the STCW 95 Convention),**

- **EXTENSION (shipboard qualifications beyond those of STCW),**

- **ENRICHMENT (additional qualifications which prepare for a career in the shore-based maritime industry, BSc degree), and**

- **ELEVATION (MSc degree for holders of BSc degrees and unlimited certificates of competency).**

Please note that the next E comprises the qualifications of the previous E or Es.

METNET has, among others, reviewed national efforts in EU member states to increase the number of ship officer aspirants (cadets), has looked at conditions which, besides unattractive MET, keep young qualified persons back from seafaring or let seafarers leave work on board.

In the environment of MET, METNET concentrated on costs and financing of MET, national data bases on seafarers, recognition of certificates of competency and intra-EU mobility of seafarers and specified actions for overcoming present weaknesses in these three areas.

METNET has made continuous efforts to disseminate its results and encourage and facilitate their exploitation.

Limitations of METNET:

METNET deals with ship officers but not with other shipboard personnel as, for example, ratings. It concentrates on ship officers because they are the "endangered species" and their knowledge and experience are needed in the maritime sector ashore. Both can not be said for other shipboard personnel: they can be recruited from

the international seafarers' labour market and their shipboard knowledge and experience are not specifically required in the maritime sector ashore as national personnel with similar qualifications are available.

It corroborates this statement that ship officers when "swallowing the anchor" (i.e. when leaving shipboard for shore-based positions) normally seek employment in the maritime sector ashore whereas other shipboard personnel do not show such a sector affinity but look for jobs inside and outside the maritime sector. These differences in attitudes to shore-based employment are not only created by differences in specific maritime qualifications but are also a reflection of differences in demand for national ship officers and other shipboard personnel in the national maritime sector.

The work of METNET for the improvement of MET quality, harmonisation of MET contents and extension of MET applicability showed that the solution to the problem of ensuring the sustainability of maritime skills bases can not be provided by MET alone, although MET can make a major and necessary contribution to the solution of the problem and is probably the stakeholder that can most flexibly re-act and most far-reaching pro-act to present and future challenges for EU maritime personnel. Contributions by other stakeholders are however equally necessary to overcome the "endangering" of the "species" EU seafarer and prevent it from becoming a "dying breed" (as it was already referred to in a newspaper article).

It is taken for granted that member states of the EU (as well as accession countries) with direct sea access are committed to maintain maritime services with national personnel – above all for shore-based activities. This may require political interventions for providing favourable conditions for national MET. They may make a national concentration of MET resources necessary as well as a facilitation of the employment of national and EU seafarers.

Broaden the scope after METNET:

The survey of required ship officer qualifications (which was a task of METNET) should be extended to a survey of qualifications needed in the maritime sector as a whole. Such a holistic approach to maritime personnel would put the qualifications of ship officers in a wider context, would increase the value of results for policy decisions on personnel in the maritime sector and complement the sub-sector approach of METNET that had to be given priority because of the endangering of the EU seafarers' continued existence.

2 STRUCTURE OF THE REPORT

This report does not only describe the objectives of, and the work for, METNET and the outcome from the project in the form of syllabi, courses, findings, conclusions, recommendations and proposed follow-up actions but also specifies how the work was done and who did it, and covers the background of, and the need for, METNET and the environment in which national MET institutions operate.

The sequence of the report is therefore:

Why METNET?
(chapters 3 and 4)

What did METNET do, how was it done and who did it?
(chapters 5 and 6)

What should be done after METNET and how?
(chapters 7 and 8)

The "why?" explains the environment in which MET institutions, the main contributors to METNET, operate and identifies quantitative and qualitative shortcomings in the sustainability of maritime skills bases in EU countries.

The "what? – how? - who?", the description of the work for METNET and its results, focuses on MET, the education and training of ship officers at MET institutions, but also refers to related subjects.

The "what? – how?", the work to be done after METNET, is mainly concerned with MET and MET institutions again but contains also recommendations and proposed follow-up actions addressed to other stakeholders in MET than MET institutions.

Although METNET was aiming at encouraging and helping MET institutions to contribute to the solution of the existing problem of the "endangered species" European seafarer, it was obvious from the very beginning of the project and also from the preceding 4th RTD Framework Programme project METHAR (Harmonisation of European MET Schemes) that solutions to present problems require the engaged involvement of all stakeholders in MET, i.e. not only of MET institutions, but also of the shipping industry (employers, unions), maritime and education authorities, professional associations and institutions or organisations involved in research dealing with maritime personnel.

Joint efforts of all stakeholders to regain and ensure the sustainability of competent and competitive maritime skills bases in EU countries can also be expected to have the positive side effect of making shipping more visible by the clustering of maritime resources.

3 THE NEED FOR METNET – THE UNSATISFACTORY SITUATION OF THE MARITIME SKILLS BASE IN THE EU

This chapter begins with a general explanation of the supply problem on which it elaborates later by identifying specific reasons that hold young people back from seafaring and make ship officers leave on-board assignments. Between these two parts, the image of the shipping industry is discussed and the partly differing interests of stakeholders in MET are reviewed in the context of existing issues. This will provide the background for a better understanding and appreciation of the unsatisfactory maritime personnel situation in the EU and how it could be improved.

"The issue for the majority of seafarers is not whether to leave the sea but when" was an observation made by Frank Main, then head of Maritime Department at Liverpool Polytechnic, in the **mid-1970s**. The retention of seafarers on board is a problem that has existed for more than 30 years. As long as enough young people chose seafaring as a (temporary) career and ensured a sufficient supply this did not matter too much, it did, however, increase the fluctuation of shipboard personnel.

"Those who could (go to sea), won't" (and "those who would (go to sea), can't") were conclusions from the METHAR (Harmonisation of European MET Schemes) project in **1999**, which identified a **serious decline of interest of young people in seafaring and an insufficient supply of ship officers from EU countries** (and a shortage of shipboard training places).

The decrease of ship officer supply ran parallel with the decrease of personnel demand although it was always ahead of it, i.e. the supply decreased at a faster pace than the demand that was substantially reduced by the rapid development of new ship types and the more frequent use of modern technology on board: a smaller number of bigger ships replaced a bigger number of smaller ships and the number of crew per ship became much smaller. The change of ships under flags of EU countries to flags of convenience and the increased use of cheaper shipboard personnel from countries outside the EU further reduced the demand for EU nationals and the number of shipboard working places for them.

It is therefore essential for the sustainability of national maritime skills bases and a EU maritime skills base that the METHAR statement "those who could, won't" (and also the statement "those who would, can't") are changed into the direction of "those who could, will" (and "those who would, can"). Something can also be done to prolong the stay on board, i.e. to delay the "when" in the statement "the main issue for the majority of seafarers is not whether to leave the sea but when".

MET institutions, maritime industry and administration can do most to meet the main objective of increasing the supply of seafarers from EU countries by making MET (MET institutions) and seafaring (maritime industry, administration) more attractive. (Maritime industry and administration can do most to provide shipboard training places.)

MET institutions are probably in the best position to adapt to the new challenges and make a career in the maritime sector - that begins with seafaring - more attractive.

METNET has worked on making the necessary provisions for increasing the attractiveness of seafaring through enhanced MET quality.

However, although improved and more widely applicable MET (which is the focus of METNET) is a crucial prerequisite for the solution of the supply problem, it remains a necessary and is not a sufficient prerequisite. Contributions by other stakeholders are necessary prerequisites too.

3.1 The image of the shipping industry

An obvious first approach to improving the attractiveness of seafaring as a (temporary) career would be to ameliorate the conditions and circumstances which hold young people back from seafaring.

Particular attention should be given to improving the image of the shipping industry. An excellent article on this topic was written by Michael Grey of Lloyd's List as Editorial to the April 2003 issue of the WMU Journal of Maritime Affairs. The poor image of the shipping industry is by far not only a result of negative publicity but has also something to do with other factors which Michael Grey lucidly explains in the following reprint of his Editorial. Improving the image of the shipping industry is therefore not only a matter of reducing accidents and, where necessary, improving living and working conditions on ships but also a matter of making the industry more visible, also by clustering of maritime activities, and its importance better understood.

<u>The " image" of the shipping industry</u>

Maritime transport is entirely essential, but mostly invisible and wholly misunderstood. Despite the fact that almost everyone on earth in some way benefits from its services, the general public in most countries has not the slightest comprehension of what shipping does and why it continues to be important. Depressing polls conducted on behalf of the industry among the public in various countries show the man and woman in the street to be totally ignorant of what it is that merchant ships do. There is no connection made between bananas and banana boats, nor even between the petrol poured into the car in the filling station and the world of the tanker.

There is almost no contemporary school syllabus, in either primary or secondary systems, in which marine transport and its significance, features. Despite more than 90% of the world's trade by volume being hauled across the oceans in ships, the inference given to children who don't know any better, by teachers who should, is that most international transport utilises the aeroplane. It may be that the historical importance of ships and sea power might be covered somewhere in a history syllabus, or that the polluting qualities of tankers may be included in citizenship or

environmental science. It is a far from satisfactory situation, and one that undoubtedly contributes to the widespread ignorance about the 85,000 ships that ply the world's waters, half of this huge number carrying cargo or passengers.

Modern shipping is, to those who know it, technologically fascinating and operating at the cutting edge, but what it does is completely taken for granted, much in the same way that electricity, the provision of clean water or effective sewage systems are taken for granted. We press a switch, or turn a tap and we expect that the service will be provided. Only when there is a power cut, water disconnected, or the sewage system running over do we notice the interruption of our service. The analogy with shipping is an obvious one; only a maritime disaster or a major pollution incident will alert the press and the public to the fact that shipping still exists.

There are a number of reasons why modern shipping is afflicted with this depressing invisibility. The first, and most obvious is the depopulation of the industry in modern times, after it had changed within a generation from one that was labour intensive both ashore and afloat, into an extraordinarily productive, highly automated and lean manned operation.

Illustrating this, one has only to consider the maritime industry in the port of London, which, in the 1950s, directly employed some 150,000 people, in the ships and repair yards, the maritime infrastructure and above all the huge dock system. In that each of these people had a family group to which, because of their direct involvement some knowledge of shipping would have been transferred, probably more than a million people would have some working understanding of the nuances of maritime transport.

At that mid-20th century year, passenger ships remained the main method of oceanic people transfer, so there was a wider understanding of shipping among those who travelled internationally. The media would routinely meet each inbound or departing passenger liner, interviewing the rich, famous and interesting passengers, just as the "snappers" lie in wait for the airborne celebrities today. Ships were part of the back-ground of daily life in a far more obvious way than is the case today.

And then, in the space of a few years, it all changed. Containerisation and the scale economies of very big ships forced the ports from the city centres out to the peripheries. The great rivers emptied of ships and their service craft; the dock systems became derelict or were redeveloped for their housing or commercial potential.

Of that vast population which was involved, directly or indirectly, with shipping, within a relatively few years, there was very little left. A large containership with its crew of twenty, could physically replace a dozen general cargo ships and their aggregated crews of nearly one thousand seafarers. And whereas there would be nothing unusual to find 350 dockers working shipside and shoreside on one of these 10,000 ton multi-decked pretty cargo liners, in the context of a modern container terminal, with its automated ground-handling equipment there might be no more than twenty people in a single shift. It is not surprising, in such circumstances, that the shipping industry does not appear in the consciousness of very many people.

An industry in a phase of major retrenchment does not perhaps deliberately go out to attract attention. Shipping for an extended period was offloading people, rather than going out to hire newcomers, and did not set out to publicise its developments. Moreover, its growing globalisation saw "national" shipping companies flagging out their fleets to the open registries (thus severing the relations with their original nation states) and hiring a new workforce from the developing world. And with this inter-nationalism came a further disconnection, from the political processes in the "traditional" shipping nations. "Why should we ever bother with you?" said the politicians, "with your flagged out ships and foreign crews?"

"Where is the national connection that can count on political interest?" Similarly media, fired up by pollution incidents (inevitably involving "flags of convenience" ships) would focus on the industry for its cheapskate, cost-cutting, tax-dodging propensities. They would be egged on by the environmental interests, which detected early on that they held the moral high ground.

And shipping, in this gloomy end of the 20th century, also had a distinct lack of heroes. Accountants anonymously managed the corporate organisations, while the family shipping companies were in full retreat. There were no Albert Ballins or Samuel Cunards, the great Greeks had handed their huge tanker fleets over to lesser men, and there was little in shipping to interest either the City page editors or those with "celebrity" stories to write. The industry was undercapitalised, there were few famous brands about and business editors would scarcely raise an eyebrow at a shipping story. The maritime industry may well have been still carrying most of the world trade, and in its cruise ships and ferries, a lot of people too, but to all intents and purposes, it has disappeared. The BBC had a Space Correspondent, but no Shipping Correspondent, any more than had any major broadsheet newspapers. Shipping was covered by the Transport Desk, by people more accustomed to writing about road rail and air problems, and who had little idea of the shipping industry and its personalities. The mists grew thicker.

And that, pretty well, remains the situation today. A well-informed "mature" group of people will be unable to identify (if asked) any major shipping company, or even name the world's biggest ship. By contrast, such well-educated folk will be able to name the five biggest oil spills by the name of the tanker involved, and will offer chapter and verse on the TITANIC.

Is there any hope of rather better, more positive, public awareness of this important world industry? The clue, it would seem, is to "repopulate" the industry by "clustering", gathering together the various strands of the maritime world into a cohesive whole, thus acquiring size, volume and importance. The Dutch demonstrated this effectively in the 1990s, when they re-awakened political interest in the industry by forming the Dutch Maritime Cluster, in which thousands of large and small interests in every facet of the maritime world were gathered. The Norwegian maritime cluster has also been an effective messenger for maritime interests, while Sea Vision UK does the same in Great Britain, welding together some 250,000 jobs into a really sizeable industry

that can attract political and public attention, promote public awareness and project career opportunities.

It is important that these schemes work, because maritime industry is very much a 21st century industry, with a great future as we use the seas more and understand them better on a dozen different planes of endeavour. It is an industry that needs the attention of the media, and the better understanding of the general public. It is our industry and we need to sell it better."

3.2 The stakeholders of MET

Although there is common agreement and conviction that MET has to qualify students as well as possible for work on ships, there are differences in interests of stakeholders that affect opinions on, and attitudes to, ship officer MET. Three important issues can be used to illustrate these differences:

- **the national vs. international issue,**
- **the theory vs. practice issue, and**
- **the individual vs. industry issue.**

Another issue that concerns all stakeholders of MET is the

- **cognitive vs. affective issue.**

Qualifying students to become ship officers was and is a national affair. In the past, also shipping used to be a national affair in respect of ownership of vessels and employment of nationals. This "national system" was broken up by the globalization of shipping and was in respect of ownership and employment replaced by an "international system".

The differences between the two systems establish the

national vs. international issue

or, more specifically, the national maritime labour market vs. international maritime labour market issue.

The fierce competition in international shipping has resulted in a more and more globalized and anonymous ownership. The necessary reduction of costs was achieved by changing ships to flags of convenience and other measures, among them the reduction of crews and their partial replacement by seafarers from low-cost shipboard personnel exporting countries outside the EU. This discrepancy between national objectives in respect of maritime personnel and commercial necessities is the crux of the maritime manpower situation in EU countries that has not only had a decisive impact on the employment of EU nationals on board ships flying the flag of a EU country but has also contributed to making seafaring less attractive.

The continued existence and prosperity of national MET can therefore not be expected to be a priority of shipping companies with anonymous ownership under flags of convenience, it should however be a priority for EU countries as it is the necessary prerequisite for ensuring the availability of EU personnel for maritime services. The sustainability of a competent and competitive EU maritime skills base depends on finding a maintainable balance between the national and the international maritime labour markets and requires a strengthening of the national labour market by national quality-enhancing efforts as well as political facilitation and support measures.

Theory vs. practice issue

50 or more years ago, MET (maritime education and training) used to be MT (maritime training), it was focused on, and confined to, training for shipboard work. This made MT a "need to know" provision on the fringe of national professional education and training systems with the additional particularity of preparing its clientele for a job that was mainly performed not inside but outside the country the flag of which the ship flew. This outsider status guaranteed maximum influence on MT by those who employed ship officers and resulted in little interaction and limited commonalities with the national education and training system for other professions. This stable and for both sides satisfactory co-operation of shipping companies and MT institutions was also supported by the maritime administration.

The balance of mutual satisfaction was disturbed when MT began to leave its fringe position and move towards integration in the national higher education system. This change was driven by students, seafarers, MET institutions and, in general, a national promotion of higher education standards but to some extent also by shipping companies that wanted better qualified personnel for more sophisticated high-tech ships and had realized that shipboard and ship-ship accidents were often no more a problem for the company and the ships involved only but could – because of environmental damage – take the rather uncontrollable dimension of public concern.

MT became MET with an increased science part in the programme; it introduced higher admission requirements and eventually reached academic degree status. Existing MET on the non-degree level was normally maintained. All MET, the non-degree and the degree one, came in EU countries also under the supervision of (Higher) Education Ministries in addition to the already existing supervision by Transport or Shipping Ministries. The emergence and participation of a fourth main stakeholder, after MET institutions, maritime industry and maritime administration, came at a price about which stakeholders partly differ.

MET institutions had now two supervisors with different obligations: the maritime authority had to see to it that international regulations, above all the minimum requirements of IMO, were met by MET programmes, the education authority had to ensure that the conditions for the award of an academic degree were fulfilled. Financing of MET institutions began to shift from the maritime authority to the education authority and more MET institutions lost their independence (also because of declining student numbers) and became departments of larger higher education

establishments, which further promoted the integration of MET into national education systems.

A divided supervision for the meeting of certificates of competency and academic degree requirements with financing from mostly the degree authority will continue to exist also in future. This development may appear as having moved MET away from practice to theory as which the responsibilities of the two supervisors are often coarsely categorized. This is a too simplistic view as there are close connections between certificate and degree subjects through, for example, the increased science content of syllabi.

It is no surprise that – despite the prolongation of study times to accommodate degree requirements - shipping companies sometimes had the impression that the theoretical part of MET was increased at the expense of the practical part, that MET did not give enough attention anymore to its shipboard orientation and that the existing gap between training at MET institutions and the job on ships had widened. These shipping companies seemed to be proven right by the IMO Convention on Standards of Training, Certification and Watch-keeping for Seafarers of 1995 (STCW) that introduced competence requirements in addition to knowledge requirements on which the preceding STCW 1978 was based (that was the first ever international convention solely for shipboard personnel). STCW 95 prescribes that it is not enough for shipboard personnel with responsibility for safety and pollution prevention to know how something is done (knowledge), but also to be able to do it (competence). This international regulatory attempt to reduce the **training-job-gap** or, more precisely, the education/training-job-gap is not limited to MET but has also been given increased attention in national education systems under the heading “quality” in its definition as “fitness for purpose” (Frederic Crawford).

Although it may appear so, it is nevertheless not true that MET in EU countries (and in Europe as a whole) lost sight of providing a qualification as close to shipboard practice as possible because it broadened the view of students to the maritime sector by the introduction of subjects like maritime economics in syllabi and by this began to prepare students for a career in the maritime industry ashore after some years at sea. As long as former seafarers are on the teaching staff of MET institutions and keep themselves up-to-date on developments on board of ships, a satisfactory concentration on shipboard practice can be expected to be maintained. Moreover, the intelligent use of modern teaching equipment, such as shiphandling/navigation, engine room, cargo handling etc. simulators, has helped to prevent a widening of the training-job-gap and has even assisted in reducing it for some shipboard activities.

Industry v. individual issue

Most benefits of the development from MT to MET, from shipboard-confined MT to ship-shore MET programmes, are reaped by the individual employee although the industry employers have profited from them too as they can today recruit shipboard personnel who are able to operate high-tech ships and have a better understanding of commercial aspects of the shipping industry. Shipping companies may see it as a disadvantage that affinity to shipboard work is today by EU citizens defined by a utilitarian view, mostly in respect of career prospects. Work on ships is no more seen

as a means to admire a tropical sunset and call at exotic ports in remote countries. Romantic is out, realism is in.

Today, West European ship officers seek job security and job satisfaction on board and also ashore where most of them transfer after some years of shipboard service. When sailing, they expect to receive salaries competitive with salaries paid ashore. Shipping companies want ship officers who are qualified to do their work on board (for which STCW knowledge and competence would suffice), prefer those who can be expected to have "sea stability" (i.e. tend to stay in seafaring) and are "affordable".

In respect of MET, the main commonality between individual and industry is therefore shipboard qualification and competence, the main difference lies in the range of employability and employment: the individual wants a ship and a shore qualification, the industry is satisfied with a ship qualification and, although there are exceptions, in general does understandably not tend to respond with great appreciation to the fact that seafaring has become a temporary career that is followed for most ship officers by a career in the shore-based, mostly national maritime industry or, in a smaller number of cases, by an alternation between shipboard and shore-based assignments.

Exceptions exist normally when shipping companies use to employ former ship officers of their company ashore and support such a scheme by promoting the acquisition of additional, non-shipboard qualifications in order to help their ship officers to prepare themselves for a change of occupation. Although the exceptions are mostly shipping company-related, the frequency of this supportive attitude to ship officers' careers in the entire maritime sector differs also between countries.

METNET that was invited to give its points of view on the **Commission communication on training and recruitment of seafarers of 6 April 2001** (COM (2001) 188 final, 6 April 2001) did so, after extensive discussions, on 9 October 2001 in a 7-page comment in which it, among others, proposed to make intensified use of a "national roundtable" of all stakeholders in MET for agreeing on changes of national MET. This would be the most effective approach to tackle issues, reconcile differences, solve problems and make national MET fit for the future.

"Considering the financing of MET that is in most EU Member States provided by governments with tax payers' money, the return of this investment should be seen in the context of the entire maritime industry, i.e. MET is not only offered for shipboard work but also for work in maritime enterprises ashore where ex-seafarers are required.

Consequently, the specification of what the industry expects from MET has to involve industry representatives from the various sectors of the maritime field where MET graduates are employed. On the other hand, the scarcity of students has increased the attention to what the individual expects from MET and stimulated the offer of a MET that provides for a career in the entire maritime industry that is seen as the most effective solution to increase the number of applicants (as also expressed in the Commission paper).

It would therefore – because of potential conflicts between the objectives of industry and individual – be advisable to develop a mechanism that lets all parties to MET take part in the decision making on the future requirements and directions of the profession. METNET would appreciate if future Commission papers on training and recruitment of seafarers emphasized the importance of joint national approaches by industry, maritime and educational authorities, trade unions, professional associations and MET institutions to solve national MET problems including the shortage of applicants. Experience has shown that the existence of a "national roundtable on MET" or a national body taking care of this function are the best guarantee to solve national MET problems with which EU Members States have until now coped in varying degrees of success."

In summary, MET needs permanent communication and interaction among stakeholders, mutual understanding and appreciation of positions and views, a commitment to cooperation and joint efforts and actions.

Cognitive vs. affective issue

It is the gap between knowledge/competence (cognitive domain) in, and attitude/position (affective domain) to, the profession that is not as well balanced as it used to be. Ship officers who began seafaring with the expectation of sailing until retirement age had a different attitude to their work than many of those who see seafaring as a short and early period in their professional career. This "disassociation" from identifying themselves with the profession and taking a utilitarian view on the job is supported by an anonymity of vessel ownership and by the frequent reduction of shipboard personnel to a cost factor. Moreover, the officers' limited endurance at sea and shortened replacement times of crews, provide little opportunity to forge links between shipboard and shore-based headquarter personnel. The ship on which one used to live and work is no more "my ship" but the ship I am on for some month more. This loss in the affective domain in affiliation and identification cannot be substituted by a gain in the cognitive domain.

IMO has tried to address deficiencies in the affective domain by promoting organisational measures that are expected to enhance the attitude to safety and involve all stakeholders concerned with it. The International Safety Management Code (ISM) can be seen as an attempt to regain lost identification with on-board tasks. Also the introduction of Quality Standards Systems as STCW requirement aims in the same direction of formalizing frameworks in an integrative approach.

The ultimate aim of these and similar attitude-shaping measures as, for example, the formulation of Mission and Goals Statements at MET institutions, is for IMO the creation and cultivation of a safety culture that is in today's complicated and complex maritime operations more needed than before.

3.3 The supply problem

The supply problem was given prominence by a EU conference on the theme "Is the European Seafarer an endangered species?" that took place in Dublin in late 1996. The then Transport Commissioner Neil Kinnock answered this question with *"on present trends, yes"*. The trends appear to have been slowed down or even halted in a few EU countries – although on an insufficient level. There are, however, no indications that they can be expected to reverse.

The European seafarer continues to be an "endangered species" and the sustainability of the maritime skills base is still in jeopardy.

A further increased supply of ship officers from non-EU countries for EU country-flagged ships would not be an acceptable lasting substitution for lacking ship officers from EU countries as it would happen at the expense of working places for EU nationals and would not satisfy the demand for national ex-seafarers from EU countries for the many positions in the shore-based maritime sector where shipboard experience is essential or desirable and where nationals are preferably employed. It would negatively affect the competence and competitiveness of national maritime skills bases in EU countries and, consequently, the EU maritime skills base.

As explained before, different stakeholders in MET may have different opinions on qualifications of, and may have different attitudes to, ship officers. Nevertheless, they do not differ in acknowledging the need for employing ex-ship officers in the shore-based maritime sector for maintaining competent and competitive maritime services.

In 2001 the European Commission gave again prominence to the supply problem in communication on training and recruitment of seafarers (COM (2001) 188 final, 6 April 2001) that, among others, reflected first results from METNET. It also dealt with aspects not covered by METNET as, for example, wages of seafarers.

This communication also identified three main challenges with which present MET has to cope:

- *"to provide quality seafarers capable of working on board modern high-quality ships";*

- *"providing seafarers with the knowledge they need to increase their prospects of mobility"; and*

- *"to adopt to the changing pattern of the profession, i.e. to provide seafarers with the necessary tools to take up onshore occupations after a reasonable number of years at sea"*.

Numerous studies have been undertaken – a few of them are still in progress – on the reasons for the reluctance of young people to choose seafaring as a (temporary) career. Other studies focus on the reasons for seafarers wanting to leave the sea after a

few years and sometimes already after having completed the sea time for an unlimited certificate of competency.

In the following a short review of the reasons for not wanting to go to sea and for wanting to leave the sea is presented. Simply put, these reasons can be allocated to two categories: what is perceived as being better on shore (than on ships) and what is perceived as being better on ships (than on shore). It is this balance between shore advantages and sea advantages, in which the pros for the shore are mostly also the cons for the ship and vice versa, that has to be improved on the sea side if more young qualified people are to be interested in "taking the plunge" (as which it is sometimes seen) and making up their minds for seafaring. Apparently, this balance is not visibly influenced by deteriorating employment opportunities on the shore side - as it has been shown in a number of EU countries. It seems however possible to improve the balance at the sea side.

In the following the views of an expert panel (within METNET) are presented. It consisted of former ship officers who have made a career in the maritime sector ashore in enterprises, administrations and at MET and maritime research institutions. Specific research projects on recruitment and retention produced the same conclusions (as the expert panel) although they may have arrived at a slightly different order of priority and may also have used a slightly different terminology. The views of the expert panel are those of METNET as a whole.

3.3.1 Why do young people in EU countries not choose seafaring as a career?

The main reasons for young people not choosing seafaring as a career are listed in order of importance, beginning with the reasons that are considered to be most important.

.1 A career as ship officer appears to be less attractive than careers in shore-based professions. It contributes to this perception that potential candidates are often not aware of possible career prospects in the maritime industry aboard and ashore. Some of them even assume that they have to stay at sea for their entire working life.

.2 The prospect of long absences from home, family and friends.

.3 The bad image of the shipping industry.
Negative events in shipping as e.g. major tanker accidents and oil spills are highly publicized, the importance of shipping for the national economy and the individual consumer and other positive aspects of shipping are hardly ever mentioned in the media.

.4 An assumed uncertainty of employment (in connection with 3).

.5.1 Prospect of hardship.
Financial reward considered insufficient compared to expected hardship.

.5.2 Expected difficulties to live with foreign crews and cultures on board.

.5.3 Low social acceptance and low prestige of the ship officer profession in most EU countries.

.6 There is an additional reason that does not specifically apply to seafaring but to other professions too: In general, there seems to be a reduced interest in technical and engineering professions.

3.3.2 Why do ship officers leave seafaring?

Some of the reasons, which hold potential candidates back from choosing seafaring as a career, are also reasons for making ship officers want to leave the sea.

Their listing in order of decreasing importance is however slightly different.

.1 The long absences from home, family and friends.

.2 An experienced uncertainty of employment.

.3.1 Experience of hardship.
Financial reward considered insufficient compared to hardship.

.3.2 Experienced difficulties to live with foreign crews and cultures on board.

.4.1 Little or no social life on board, little or no regeneration in ports. (short lay times, high workload, frequently long distances between ports and cities)

.4.2 Skeleton (minimum) crews, fatigue.

.4.3 Discrepancy between “responsibility” on board and “decision making” on shore (blame culture)

.4.4 Poor personnel management – aboard and ashore.

4 OBJECTIVES OF METNET

METNET addressed quantitative and qualitative problems with national maritime personnel, which are widely spread and exist in all EU countries (with MET), and identified and specified contributions to solutions of these problems that can be made by national MET. METNET expects the participants in the network to act as "change agents" and to pursue the national exploitation of the METNET results.

The superior objective of METNET was to help regain and ensure the sustainability of a competent and competitive skills base for maritime services in EU countries for which ship officers and ex-ship officers are of crucial importance.

If the overall approach of METNET should be described by a slogan then

QUANTITY THROUGH QUALITY

would be an appropriate choice as the main thesis of METNET was that the most effective contribution of MET to the solution of the existing supply shortage would be better employment and career prospects for ship officers through improved and more widely applicable MET.

First, however, the recommendations of the expert group are presented

- whose identification and prioritization of reasons for young people not wanting to go to sea (recruitment problem) and for ship officers wanting to leave the sea (retention problem) were given in the previous chapter under 3.3.1 and 3.3.2, respectively –

on how recruitment and retention difficulties could be diminished and, ideally, overcome. The expert group chose an all-comprising approach and took for granted that all stakeholders of MET could – jointly or individually – contribute to overcoming the supply problem.

In the other two parts of this chapter are the main objectives of METNET presented and the specific METNET-related objectives of the programme/call for the 5th RTD Framework Programme, thereafter the differences between METNET and METHAR, the project on Harmonisation of European MET Schemes in the 4th RTD Framework Programme, on which METNET is to a considerable degree built.

4.1 What could and should be done to attract more young people from EU countries to, and retain them longer in, seafaring?

.1 Seafaring has to be promoted as an attractive career, beginning in schools (as e.g. in Denmark) and also using print media (as in a number of EU countries) and TV (as e.g. in The Netherlands); it should however not be promoted as a career in seafaring but as a career in the maritime industry that begins on board and continues ashore (recruitment).

.2 Such a promotion should not only cover the entire scope of professional opportunities but should also inform potential candidates about the “good parts” and the “bad parts” of temporary seafaring and stress the necessity and the value of making shipboard experience before “swallowing the anchor” (recruitment).

.3 Among the “good parts” are working in a team, having responsibility, being able to take decisions and own initiatives. There is an element of adventure in this although no more in the sense of seeing foreign countries and calling at exotic ports but in the sense of being together with others (team) on one’s own, holding greater responsibility than at a similar age and state of career in a shore-based position, being involved in the team’s meeting and coping with challenges and being directly responsible for own performance and well-being of others (recruitment and retention).

.4 Such promotion can, however, already in the medium term not be effective, if the conditions which keep potential candidates back from seafaring and make them leave it fairly soon are not considerably improved (recruitment and retention).

.5 Objectives of those holding financial stakes in shipping companies and attitude and actions of those having executive power are not always conducive to a sound personnel management, to developing a corporate identity and to reducing employment uncertainty and, in general, to creating and maintaining job satisfaction so that ship officers seek to leave the sea at the earliest opportunity. A change of this attitude of many a company to giving increased attention and importance to shipboard personnel would be of great help in increasing the attraction of seafaring (recruitment) and keeping seafarers on board (retention).

.6 Efforts to make seafaring more attractive and keep ship officers longer on board should be shared and become a joint effort of the shipping industry, the administration and the education and training of ship officers (MET institutions) and other parties concerned with maritime personnel (recruitment and retention). These efforts should be national efforts.

.7 Those wishing to go to sea should be given the opportunity to enter MET with different levels of general education (recruitment).

.8 As MET is in most EU countries paid by the government (i.e. from tax payers’ money), a return from this investment to the national economy can be expected.

To those having chosen seafaring as the beginning of a career in the maritime sector and first working on ships and later in maritime affairs ashore, a comprehensive MET should be offered that serves the entire maritime sector and sees the qualification for shipboard service as a necessary and important part of a broader qualification (recruitment and retention).

Ship officers, who did not receive such a more comprehensive MET, should be given the opportunity to upgrade their knowledge in subjects which would facilitate their

mobility in the maritime field. The suitability of distance learning for such upgrading should be explored and exploited (recruitment and retention).

.9 Ship owners/operators should, among others, facilitate the communication of their shipboard crews with families and friends ashore by making use of modern Information and Communication Technology, ICT (retention).

.10 The administration should, among others, financially participate in the provision of on-board training places (recruitment and retention).

.11 MET institutions should, among others, prepare students and also serving ship officers for working and living with people from different nationalities and cultures and should give importance to human factor/human element subjects in their programmes as e.g. personnel management and leadership training. MET institutions should, in cooperation with the industry, offer professional updating courses and, in cooperation with institutions of higher learning, upgrading courses leading to higher academic degrees. MET institutions should also get involved in the development of distance learning packages for on-board use (retention).

4.2 Main objectives of METNET

METNET is to improve the quality, harmonize the contents and extend the applicability of maritime education and training for ship officers (MET) in the EU for helping satisfy the qualitative and quantitative needs for personnel in waterborne transport.

Improved MET quality will increase the competitiveness of ship officers, create more jobs for EU nationals and make EU shipping safer, more environment-friendly and more efficient.

Harmonized MET contents will help to develop the basis for a future European ship officer, improve his/her mobility, promote mutual recognition of ship officer certificates and facilitate cooperation between MET institutions.

Extended MET applicability will make the ship officer career more attractive and will contribute to meeting the existing demand for national ship officers in most EU countries by an increased supply that will also ensure the provision of ex-ship officers for positions in the maritime industry ashore.

METNET responded to both industry and individual needs and focused on increasing employment through enhancing employability by furthering knowledge and skills development.

METNET addressed the scarcity of resources of national ship officers in EU countries and will help slowing down, halting and eventually reversing the trend towards a further endangering of the EU ship officer’s existence.

Ultimately, the meeting of METNET objectives will support sustainable growth in competence and competitiveness of maritime personnel in the EU and their mobility within European shipping.

The specific objectives of METNET were given in the programme/call for the 5th RTD Framework Programme:

- European approach to mitigate the problem of the European seafarer based on MET,
- common framework for a Future European Seafarer,
- criteria for evaluation of competency, case studies for a coordinated approach to MET schemes curricula,
- basic principles for a common approach to certification,
- workshops with accession countries,
- marine environment protection and port and shipping operation training schemes, and
- operational benefits for nautical schools, policy makers, maritime administrations, shipping companies.

It should be noted that the original title of the project was Thematic Network on Maritime Education, Training and Certification of Seafarers in which "Certification" was in the very beginning replaced by Mobility. This change acknowledged that shortcomings in the mutual recognition of certificates of competency are not the only hindrances to a professional mobility of ship officers within EU countries.

METNET will also operate as a project cluster for the exploitation of results from the 4th RTD Framework Programme (FP 4) projects MARCOM, MASIS II, MASSOP, MASSTER, SEAGULL, WORKPORT and other RTD projects, of which outcomes may be identified as relevant to METNET. The project however to which METNET relates more than to other projects, is METHAR. Moreover, a substantial number of participants in METNET were involved in the above-mentioned projects and the coordinator of METNET was before also the METHAR coordinator/CAMET chairperson.

4.3 Differences between METNET and METHAR

METNET attended to a considerably more comprehensive range of subjects than METHAR and had a much wider representation of stakeholders in MET in the consortium than METHAR.

METHAR aimed at describing, analysing and evaluating the status quo of West European MET, highlighting existing problems, identifying their reasons and recommending general solutions. METNET aimed at improving the status quo of MET in all Europe and the non-European Mediterranean and specifying solutions for

existing problems. As part of these efforts, METNET developed model syllabi and courses for use at MET institutions.

METHAR had focussed on MET systems, METNET focussed on MET quality, supply of ship officers and professional mobility. METHAR, in particular through CAMET, helped with meeting the requirements of the STCW Convention, METNET operated post-STCW, it (correctly) took for granted that the minimum requirements of STCW had in the meantime been met by MET institutions and maritime administrations in EU countries.

The METHAR consortium consisted of 5 partners, the METNET consortium consisted of 19 partners. The partners in METHAR were universities with maritime programmes and MET institutions, the partners in METNET came also from these two groups but also from a variety of other stakeholders in, and potential contributors to, MET.

What CAMET was for METHAR were the two Reference Groups of MET Institutions and of Governmental MET Administration for METNET.

METHAR was limited to representation from 13 EU countries, Iceland and Norway, it was confined to West Europe. METNET had a Polish maritime university in the consortium and two groups from non-EU countries participating in some common meetings with West European representatives and attending separate workshops.

The first group of MET institutions and maritime administrations comprised the East European accession countries Bulgaria, Estonia, Latvia, Lithuania, Poland, Romania and Slovenia and the East European not-yet-accession country Croatia (that supplies officers to ships flying the flags of EU countries).

The second group consisted of MET institutions and partly also maritime administrations from the Mediterranean accession countries Cyprus and Malta and the Mediterranean non-accession countries Egypt, Israel, Morocco, Turkey.

Taken together, METHAR was limited to the 15 West European countries which also took part in METNET that had participation from altogether 29 countries, the just mentioned 15 West European ones, 9 accession and 5 non-accession countries.

METHAR collected, analysed, evaluated information and made general proposals to overcome the existing problems, METNET did the same in more depth for a bigger number of subjects (and countries) and produced tangible results.

Both METHAR and METNET concentrated on the contribution of MET to the solution of existing problems, however, only METNET addressed the possible contribution of other stakeholders to the solution of these problems.

5 MEANS USED TO ACHIEVE METNET OBJECTIVES

The definition and specification of **what** had to be done to approach and meet the objectives was made on the basis of relevance, exemplary value and expected impact of results from each work package: see 5.1 List and categories of work packages.

The choice of approach to **how** to do it was made with a view on the content and purpose of each work package on the basis of applicability, effectiveness and feasibility: see 5.2 Methodologies used for various work packages.

The identification, assembling and networking of those **who** would do it was made with the criteria related expertise and experience in mind: see 5.3 Consortium and allied groups.

5.1 List and categories of work packages

The work programme of METNET can be divided in a "MET-direct" part and a "MET-indirect" part and a part related to both categories.

The "MET-direct" work programme focused on the development of improved, harmonized and more widely applicable syllabi for MET students and specialized courses for MET students, MET graduates and lecturers at MET institutions and, moreover, the dissemination and exploitation of these new programmes.

The "MET-indirect" work programme addressed the optimum use of national MET resources and the increase of the supply of ship officers and measures supporting and facilitating mobility.

The following overview contains the titles of work packages grouped in the above-mentioned three categories.

Details of work packages and sub-work packages (tasks) are addressed under 6 WORK AND RESULTS OF METNET where also the institutions/organisations are given which were responsible for a work package and the other institutions/organisations which prepared materials or reports for specific tasks.

<u>"MET-direct" WPs (Work Packages) and Ts (Tasks):</u>

WP 5 Design of common syllabi/curricula

WP 6 Design of courses for a syllabus for common use, which are needed for the Extension and Enrichment of MET, and of courses within the STCW 95 requirements which need to be considerably changed. Early identification of new qualitative MET needs

WP 7 Design of maritime English back-up material (to courses developed in WP 6) for use at MET institutions in countries where English is not the official language

WP 8 Design of training the trainer courses

"MET-indirect" WPs and Ts

WP 2 Evaluation of national studies and efforts for meeting the national demand for seafarers by a national supply

WP 3 Costs and financing of MET

WP 4 MET students and ship officers statistics.
Early identification of new quantitative MET needs

"MET-direct" and "MET-indirect" WPs and Ts

WP 1 Evaluation of FP 4 projects for exploitation in METNET

WP 9 Establishment of principles for a common approach to certification. Issues related to the mobility of seafarers in the EU

WP 10 Identification and specification of benefits from improved, more harmonized and wider applicable MET

WP 11 Network management and coordination

WP 12 Dissemination, exploitation and IPR

WP 13 Extension of the network (East Europe and Mediterranean)

WP 14 Recommendations for policy and decision makers

5.2 Methodologies used for various work packages

Different methodologies were used for different types of work, they were also chosen and designed with a view on their suitability for strengthening cooperation and coherence within the METNET Consortium and the allied groups. This **involvement approach** for all participants has been maintained and continually strengthened during the entire duration of the project.

For "MET-direct" work packages and tasks the choice of methodology resulted in the **"iterative approximation" approach** for the development of the common syllabi

(WP 5) and the **"catalyst workshop" approach** for the development of the courses (WPs 6, 7 and 8).

"Iterative approximation" approach: the draft syllabi were sent to all involved in METNET with the request for comments. After reception of a sufficient feedback, the syllabi were amended and again (and again) presented to the audience of MET representatives in METNET. By this iteration of invited feedback, the draft syllabi could be improved in steps and came closer and closer (approximation) to more specific and better syllabi which were more and more appreciated by those having contributed to their involvement.

"Catalyst workshop" approach: this involvement approach was pursued through workshops for most courses to which the specialists in the subjects of each course were invited whose MET institutions were represented in METNET. Participants of the workshops are expected to take the role of catalysts for the national distribution and implementation of the courses.

Draft and advanced versions of syllabi and courses were not only electronically distributed with the request for comments but were also lodged at the WMU server where amendments could be made by authorized persons and access granted through passwords to those with a special interest in the subject who could also leave their comments there.

Moreover, the various versions of the syllabi and courses were presented and discussed at meetings.

For "MET-indirect" work packages and tasks, a literature search was carried out and publications on the subjects of work packages were reviewed - with the help of national representatives (and also for language reasons) - thereafter, questionnaires were designed for collecting related information from each country - with the help of national representatives who had access to the information that was to be collected. The evaluation of the compiled information was distributed electronically with the request for comments and presented and discussed at meetings.

The "MET-direct" and "MET-indirect" work packages and tasks provided either framework (WP 11) or relevant information (WP 1) before the actual work for METNET could begin or dealt with results of the project (WPs 10 and 14) or their dissemination (WP 12). The only exceptions, i.e. WPs not attended to before or in the beginning or only in the end of the project, were WPs 9 and 13 that ran through the entire project.

For WPs 9, 10, 12, 13 and 14 the involvement approach was applied so that the results of these five WPs can also be taken as common conclusions and recommendations of the Consortium and the Reference Groups.

5.3 Consortium and allied groups

The **19-party Consortium** that consisted of institutions and organisations from 10 EU countries, Norway and Poland was supported by **Reference Groups of MET Institutions and Governmental Administration of MET** which complemented the representation of MET institutions and governmental administration of MET in the Consortium to the 13 EU countries in which MET is offered (i.e. all EU countries except Austria and Luxemburg), Iceland (only MET institution), Norway and Poland.

Outreach groups to MET institutions and maritime administrations in 7 East European (Bulgaria, Estonia, Latvia, Lithuania, Romania, Slovenia; Croatia) **and 6 non-EU Mediterranean countries** (Cyprus, Malta, Egypt, Israel, Morocco, Turkey), of which 6 and 2 respectively are accession countries, brought the number of countries involved in METNET to 29 (13 EU countries, Iceland, Norway, 8 East European countries, 6 non-EU Mediterranean countries).

The heads of MET institutions in Algeria and Tunisia were invited to participate, they expressed strong interest and confirmed their participation but did not show up at any of the 4 meetings of their group (Algeria) or showed up only at the first meeting (Tunisia).

The **Consortium** was composed on the basis of the following main criteria:

- gathering of appropriate expertise and competence for the work for METNET with emphasis on MET institutions and maritime research institutes;
- representation of all stakeholders involved in, or concerned with, MET;
- inclusion of institutions/organisations which participated in related projects in the 4th RTD Framework Programme (FP 4); and
- participation from a majority of EU countries, Norway and the biggest East European accession country.

The Consortium met the above-mentioned criteria by the following composition:

- 1 international maritime university as coordinator that provides postgraduate education for lecturers at MET institutions, maritime administrators, port and shipping managers and has had experience in the coordination of previous EU projects and studies in the maritime personnel and human resources area, such as METHAR in FP 4 (Harmonisation of European MET Schemes), CIIPMET (MET systems (and standards) in China, India, Indonesia and the Philippines), EASTMET (MET systems (and standards) in Croatia, Estonia, Latvia, Lithuania, Poland, Russia, Ukraine) and MASSOP (Management Structures of Shipowners and Shipoperators), and has had experience as partner in the FP 4 projects MARCOM (The Impact of Multicultural and Multilingual Crews on Maritime Communications) and MASSTER (Maritime Standardised Simulator Training Exercise Register).

- 5 institutions offering MET programmes leading to unlimited certificates of competency

- 1 national maritime administration of MET

- 1 national education authority of MET

- 1 national shipowners' association

- 1 national seafarers' union (also representing ETF, the European Transport Workers' Federation)

- 1 European professional association

- 1 European association of maritime research institutes and
  5 national research and consultancy institutes working on different aspects of waterborne transport (4) and European transport integration (1)

- 1 company dealing with the use of modern information technology in shipping

- 1 European association engaged in the promotion of regional maritime interests.

10 of the 13 EU countries with MET were represented in the Consortium, the remaining 3 countries were represented in the Reference Groups.

Besides the coordinator, participants in the consortium coordinated the partly related FP 4 project MASSTER and were partners in the FP 4 projects ATOMOS III and IV(Advanced Technology to Optimise Maritime Operational Safety), MARCOM, SEAGULL (Long Distance Learning Technologies in MET) and in the FP 5 project ADVANCES, the Added Value Network Concerning European Shipping

Four principal contractors formed the core of the METNET Consortium:

1 **WMU**, World Maritime University, Malmö, Sweden **(coordinator)**
2 **AMRIE**, The Alliance of Maritime Regional Interests in Europe, Brussels, Belgium
3 **CETEMAR**, Centro de Estudios Tecnico-Maritimos, S.L., Barcelona, Spain
4 **SI**, Southampton Institute, Southampton, United Kingdom

The four principal contractors of METNET were supported by **fifteen members and two sub-contractors**:

5 **CEDRE**, Centre of Documentation, Research and Experimentation on Accidental Oil Spillages, Brest, France

6 **CESMA**, Confederation of European Shipmasters' Associations, Rotterdam, Netherlands
7 **ENIDH,** Escola Náutica Infante D. Henrique, Oeiras, Portugal
8 **FIADM**, National Board of Education, Helsinki, Finland
9 **GAUSS**, Gesellschaft für Angewandten Umweltschutz und Sicherheit im Seeverkehr, at the University of Applies Sciences, Bremen, Germany
10 **GMU**, Gdynia Maritime University, Gdynia, Poland
11 **HWFSW**, Hochschule Wismar, Fachbereich Seefahrt, Warnemünde, Germany
12 **IMP,** Instituto Marítimo – Portuário, Lisbon, Portugal
13 **Fh-Hamburg**, Institut für Schiffsführung, Seeverkehr und Simulation (ISSUS), at the University of Applied Sciences, Hamburg, Germany
14 **ISTIEE**, Istituto per lo Studio dei Transporti nell' Integrazione Economica Europea, Università degli Studi di Trieste, Trieste, Italy
15 **MIWB**, Maritiem Instituut Willem Barentsz, Terschelling, Netherlands
16 **NEPTUNE**, Association of Maritime Research Institutes in EU countries, Brussels, Belgium
17 **NSA**, Norwegian Shipowners' Association, Oslo, Norway
18 **NUMAST**, National Union of Marine Aviation and Shipping Transport, London, United Kingdom, also representing **ETF**, European Transport Workers' Federation, Brussels, Belgium
19 **SATPOOL,** Gothenburg, Sweden
20 **Professor David Moreby**, Plymouth, United Kingdom, Subcontractor to WMU
21 **Professor Boris Pritchard**, Maritime Faculty, Rijeka University, Croatia, Subcontractor to WMU

This composition of METNET was also well suited to meet the requirements of the network in regard of inter-disciplinarity and complexity.

6 WORK AND RESULTS OF METNET

6.1 The 4E concept of MET

METNET has agreed on a concept for MET, the "4E concept" and the use of a common terminology. This agreement has facilitated the work during METNET. The concept and the terminology are today also used outside the "METNET community".

THE 4E concept of MET

ESSENTIALS – EXTENSION – ENRICHMENT – ELEVATION

In the past, ship officers leaving the sea were often not satisfactorily prepared for work in shore-based positions in the maritime sector as they had only been exposed to maritime education and training (MET) that was shipboard-confined. Today, most national MET systems and programmes offer opportunities for students to qualify themselves not only for work aboard ships but also, after some years at sea, for a career in the maritime sector ashore. This, although not appreciated by all ship operators, raises the attraction of seafaring in general and helps recruit young qualified people for seafaring careers, which normally do not continue on board ships but in the maritime sector ashore.

The preceding research action METHAR has revealed that the scope and suggested purposes and contents of such "addenda" to shipboard-confined MET show considerable differences. METNET has therefore developed the 4E concept of education and training for ship officers in order to facilitate international communication on and comparison of MET systems and programmes. This communication is necessary for providing a connection between national MET and the international labour market for maritime personnel. However, the main goal remains to attract more qualified young people to the sea and preferably keep them for some years on board for gaining the competence that is appreciated and needed in the maritime sector ashore.

- **The first E** of the 4E concept stands for **ESSENTIALS** and denotes MET programmes that cover the minimum requirements of the STCW Convention.
- **The second E** stands for **EXTENSION**, the extension of MET programmes beyond STCW Convention requirements. Extension is confined to shipboard knowledge and competence and represents non-degree MET. Extension can have two basic forms: It can be an extension of a Convention topic or an extension to a non-Convention topic.
- **The third E** stands for **ENRICHMENT** to Essentials and Extension. Enrichment normally qualifies MET as degree MET and provides a basic qualification for employment in the shore-based maritime industry and a better appreciation of shore-based requirements which can also be of benefit for shipboard work.
- **The fourth E** stands for **ELEVATION**. An Elevation programme is offered to students with 3E MET. It leads to an MSc or MBA degree. An Elevation programme should be directed to a more specific qualification for work in the

maritime industry ashore. Only a few universities/MET institutions in Europe should offer it.

The majority of the 29 countries participating in the METNET Consortium and its Reference Groups (16) and in the East European (7) and Mediterranean groups (6) of accession and non-accession countries offer 3E MET. Some countries with 3E MET also offer 2E MET and a few countries offer only 2E MET.

With a view on the benefits for industry and individual, METNET recommends:

- **to offer and promote 3E MET in all countries,**
- **to maintain 2E MET in the countries where it is today offered in order to increase the number of national applicants,**
- **to offer upgrading programmes from 2E MET to 3E MET,**
- **to offer graduates of 3E MET the opportunity of upgrading to 4E MET.**

Moreover, METNET has agreed on the use of the terms degree-MET (3E MET (and 4E MET)) for MET that prepares for an academic degree (BSc (or MSc) or equivalent) and an unlimited certificate of competency, and non-degree MET (1E MET and 2E MET) for MET that prepares for an unlimited certificate of competency only.

METNET has also agreed on the use of the terms one-step MET for MET, which covers the STCW Convention requirements for the operational (watch-keeping) and for the management level without a break in between, and two-step MET for MET for which a break between the two levels is introduced for acquiring a longer shipboard experience than may be possible during summer breaks at MET institutions (in one-step MET).

6.2 "MET-direct" work packages and tasks – WPs 5, 6, 7 and 8

MET quality can be improved by raising the quality of the four main elements of national MET systems:

students, staff, programmes and facilities.

Obviously, better quality of MET graduates is a consequence of a quality enhancement of the other three elements. The latter can also be expected to result in the application of more students with good higher general education achievements.

Identifying (as below) the main relationships between the four main elements of MET systems and the four main environmental influences on national MET –

economics (industry), regulations (administration), society (individuals), technology –

shows that programmes are related to all four main environmental influences and offer therefore a promising approach to improving MET quality. Nevertheless, maritime lecturers remain the "change agents" and programmes are their main tool to bring about change and to adapt themselves to new requirements.

	economics (industry)	regulations (administration)	society (individuals)	technology
students	x		x	
staff	x	x		x
programmes	x	x	x	x
facilities				x

Main relationships between main elements of, and main influences on, MET

METNET has developed exemplary syllabi and courses for students which will benefit the industry and the individual, respond to changes in international regulations, make MET more attractive for potential applicants and provide for a better exploitation of modern technology by MET.

METNET has also developed courses for teaching staff for a more effective use of modern technology at MET institutions.

In detail, METNET has developed syllabi for students at MET institutions for

- **marine engineering MET (T 5.2, WMU)**
- **nautical MET (T 5.3, GAUSS), and**
- **dual-purpose (marine engineering and nautical) MET (T 5.4, MIWB);**

and courses for students (all four courses) and ship officers (first three courses) on

- **marine environment protection (T 6.2, WMU and CEDRE),**
- **port operations and costs (T 6.3, GAUSS),**
- **shipping operations and costs (T 6.4, NEPTUNE through Cardiff University), and**
- **celestial navigation (T 6.5, GMU);**

and English language back-up material for the first three courses (Ts 7.2, 7.3, 7.4; WMU; Maritime College, University of Rijeka, Croatia; HWFSW).

These syllabi and courses will help improve the quality of MET, harmonize the contents of MET and extend the applicability of MET. They are also to serve as examples and impetus for a critical review of existing programmes at MET institutions and their updating. They are to help to make the rather static MET syllabi more proactive by increasing attention to both the industry's and the individual's expectations and needs.

MET has to ensure that its graduates have maximum market value in the maritime sector, are enabled for, and committed to, life-long learning and should, consequently, have minimal difficulties to find employment.

METNET has also developed courses for lecturers for improving their knowledge and skills in the use of modern technology. These courses are on

- **the application of modern technology in teaching (T 8.2, WMU),**
- **the application of modern technology in assessment (T 8.3, MIWB),**
- **the optimum use of shiphandling/navigation simulators (T 8.4, Fh-Hamburg), and**
- **the optimum use of engine room simulators (T 8.5, HWFSW).**

WP 5 – Design of common syllabi/curricula (WMU and GAUSS)

T 5.1 Design of a common approach to syllabus specification (GAUSS)
T 5.2 Creation of a syllabus for marine engineering MET (WMU)
T 5.3 Creation of a syllabus for nautical MET (GAUSS)
T 5.4 Creation of a syllabus for dual-purpose MET (MIWB)
T 5.5 Exploitation of modern technology in teaching marine engineering and nautical syllabi (AMRIE)

The development of common syllabi leading to unlimited certificates of competency in the marine engineering and nautical specializations (Ts 5.2 and 5.3) was the main work of WP 5 that also provided the basis for the creation of the common dual-purpose syllabus (T 5.4). This work had to take into account the syllabi developed by IMO for the implementation of STCW. The minimum requirements of STCW are identical with Essentials, the first E of the 4E concept of MET. MET syllabi in West and East European countries comprise, as far as shipboard qualifications are concerned, also - in varying degree - Extension, the second E of the 4E concept of MET. The common syllabi were therefore developed on this basis, i.e. they include Essentials and Extension, but leave the specification of Enrichment to national MET and MET institutions. METNET has expressed a clear preference for an Enrichment that prepares MET graduates for work in the maritime industry as a whole, on board and on shore. This requires inclusion of maritime transport-related commercial and legal subjects in syllabi.

There are two other types of Enrichment that are favoured in the USA and used to be favoured in East Europe. In the USA MET aims at preparing students for work on board and in the industry as a whole, i.e. inside and outside the shore-based maritime industry. More attention than in European MET is, for example, given to liberal arts subjects and the development of leadership skills. MET in East Europe used to be focussed on shipboard qualifications with emphasis on a sound education in science. Changes during the last decade show however an increasing inclusion of maritime transport-related commercial and legal subjects in syllabi.

The common syllabi developed by METNET are not only more comprehensive than what IMO has prepared in the form of STCW-based model courses, they also provide for an appropriate modular structure for a curriculum that can be harmonized with the European Credit Transfer System (ECTS). Moreover, the modules of the common syllabi developed by METNET have been referenced to the corresponding competence tables in the STCW Code so that the common syllabi can also be regarded as a complementary and further development of the work by IMO.

WP 6 – Design of courses for a syllabus for common use, which are needed for the Extension and Enrichment of MET, and of courses within STCW 95 requirements which need to be considerably changed. Early identification of new qualitative MET needs (WMU)

T 6.1 Design of framework for development of new courses (WMU)
T 6.2 Creation of a course on marine environment protection (WMU and CEDRE)
T 6.3 Creation of a course on port operations and costs (GAUSS)
T 6.4 Creation of a course on shipping operations and costs (NEPTUNE through Cardiff University)
T 6.5 Creation of a course on celestial navigation (GMU)
T 6.6 Early identification of new qualitative MET needs (WMU)

"Catalyst workshops" (see 5.2 Methodologies used for the various work packages) for the further development of the courses of Ts 6.2, 6.3 and 6.4 were held at the institutions that were responsible for the courses, i.e. in Malmö, Bremen and Cardiff, respectively.

The main criterion for the choice of subjects for the courses was their exemplary value for the further improvement of MET. This is particularly true for the course on celestial navigation (T 6.5). An enquiry into the time that MET institutions in different countries spend on the subject resulted in figures between 50 and 200 hours. It showed that a number of MET institutions have not reacted to the fact of celestial navigation having been downgraded – also by IMO – from a primary to a back-up navigation system because of the availability of reliable electronic navigation systems on ships' bridges.

The occasional non-reaction at MET institutions to this fundamental change in the role and importance of celestial navigation is obvious proof of a preference of some maritime lecturers to perpetuate outdated syllabi contents. Such an attitude is detrimental to the updating of syllabi, the more so as it seems to be accompanied by an insufficient interest in changes in international regulations and shipboard reality. Other MET institutions that allocate fewer hours to celestial navigation show that they have reacted to changes and are up-to-date on international regulations and in contact with shipboard reality.

It is of crucial importance for the validity of MET syllabi that teaching staff at MET institutions keep themselves up-to-date of developments on ships and in

shipping and integrate changes in syllabi which may also make it necessary to decrease or increase the allocation of hours to subjects as, for example, celestial navigation and marine environment protection, respectively.

Lecturers at MET institutions have also to respond to changes of and new international regulations. The response to the revised STCW is satisfactory, the response to the ISM Code (See also Recommendations 7.2.4 and 7.2.11.) is not always satisfactory. An appropriate response to IMO's new International Ship and Port Facility Security Code (ISPS) that will enter into force in mid-2004 will still have to be developed at most MET institutions. (See also Recommendations 7.2.4 and 7.2.1.1)

The course on celestial navigation developed by METNET comprises 45 hours and has a practical bias. It is hoped that the MET institutions with excess hours on the subject adapt celestial navigation to the METNET proposal and use the hours which become available for subjects the importance of which has grown as, for example, marine environment protection.

It is obvious that adaptation of syllabi is a matter for both the management of MET institutions and individual lecturers. The latter may be the greater hurdle to overcome: long-serving lecturers tend to be reluctant to accept and introduce changes to subjects that they may have taught for decades. It may support this attitude that the average age of lecturers at West European MET institutions is high – compared to MET institutions in other countries – which is a result of declining student numbers, Normally, MET institutions receive funds for staff in a ratio to the number of students and may therefore not have been able to recruit a sufficient number of new and younger staff for many and sometimes too many years.

The course on marine environment protection (T 6.3) was developed by WMU and CEDRE as a response to the threat to the marine environment through oil and chemical tanker accidents that have regrettably also happened during the 3-year duration of METNET. The course is roughly divided in pollution and its consequences, pollution prevention and combating. The prevention part deals with on-board measures. The combating part covers on-board and on-shore activities so that ship officers have a better understanding of their role in case of a spill and can cooperate as much as possible. An enquiry into the attention given to the subject in MET syllabi showed again a considerable variety among MET institutions in different countries. There are MET institutions that give the subject appropriate attention and others which rather neglect it. The course will help the latter MET institutions to cover the subject adequately.

The subjects of the courses on port operations and costs (T 6.3) and shipping operations and costs (T 6.4) were chosen, as the subject marine environment protection, with the aim to provide additional shipboard qualification as well as a better understanding and appreciation of shore activities and necessities that may have an impact on shipboard operations. Whilst marine environment protection was also chosen in respect of its urgency, the port and shipping courses were also selected because of their commercial context that is not well enough known to many ship

officers who see themselves subjected to headquarter decisions without being able to fully understand and appreciate them. A better familiarization of ship officers with commercial operations will also help sharpen their cost consciousness and make them valued partners of the shore management (instead of degrading them to remote-controlled drivers of ships).

The three courses on marine environment protection, port and shipping operations and costs, are courses that are in both the categories Extension and Enrichment. It is expected that all three courses will contribute to the harmonisation of syllabi contents either by being implemented as given or by a "rub-off effect" that would result if the syllabi of the three courses would be compared with existing provisions for the three subjects and would, if different, be adapted to or at least amended in direction of the METNET courses. The courses were developed for MET students, i.e. for integration in regular syllabi, and for use as updating courses for ship officers who were not given sufficient exposure to these subjects during their MET studies.

WP 7 – Design of maritime English back-up material for use at MET institutions in countries where English is not the official language (WMU)

T 7.1 Framework for the development of maritime English language syllabi (WMU and HWFSW)
T 7.2 Creation of English language material for course on marine environment protection (T 6.2, WMU)
T 7.3 Creation of English language material for course on port operations and costs (T 6.3, Maritime College, University of Rijeka, Croatia)
T 7.4 Creation of English language material for course on shipping operations and costs (T 6.4, HWFSW)
T 7.5 Specification of framework for integration of new courses (WMU)

A good command of the English language and of maritime terminology and phrases is a prerequisite for the ability of ship officers to work with multi-lingual crews. Maritime terminology and phrases, i.e. maritime English, can be divided in two parts: in an on-board part and an on-shore part. Safety-relevant maritime English is covered by IMO's Standard Marine Communication Phrases (SMCP). There is however limited or no similar provision for maritime English used on-shore as, for example, in the areas of the courses on marine environment protection, port and shipping operations and costs. The development of English back-up material for these three courses is therefore an attempt to direct attention to the need for more comprehensive English language syllabi that cover not only the ship-related part of maritime English but also the shore-related part. Moreover, the English language back-up material is to facilitate the delivery of the three courses in classroom to both MET students and ship officers. Thirdly, the material is also seen as a sort of catalyst for intensified cooperation between maritime English lecturers and technical subject lecturers at MET institutions which, in turn, leads to the question which special qualifications maritime English lecturers at MET institutions should be expected to have.

There are established qualification profiles for engineering or nautical subject lecturers but not for maritime English lecturers. This has led to a fairly wide range of academic backgrounds and professional experiences of maritime English lecturers. It may also be a reason for maritime English lecturers at MET institutions sometimes not being treated as equal members of the teaching staff and receiving the appreciation they expect to be given, at least because of the importance of their subject in the overall syllabus, although even this (growing) importance is occasionally belittled by lecturers of technical subjects who are able to teach in English.

The development of English language back-up material for the three courses can also be seen as support to a top-down approach to improving maritime English standards. This alone will however not solve the problem of inadequate maritime English and English language proficiency of many MET students in some countries. A bottom-up approach to maritime English at MET institutions, i.e. sufficient attention to the subject from the beginning of studies, would in the long run be a more effective approach. A necessary provision for the success of both bottom-up and top-down approach during and after MET, respectively, is the quality of English language programmes in general education.

WP 8 – Design of training the trainers courses

T 8.1 Design of a framework for the development of training the trainers courses (WMU)
T 8.2 Creation of a course and course material on modern technology use in teaching (WMU)
T 8.3 Creation of a course and course material on modern technology use in assessment (MIWB)
T 8.4 Creation of a course and course material for shiphandling/navigation simulator instructors (Fh-Hamburg)
T 8.5 Creation of a course and course material for engine room simulator instructors (HWFSW)

"Catalyst workshops" (see 5.2 Methodologies used for various work packages) for the further development of the courses of Ts 8.2, 8.3, 8.4 and 8.5 were held at the institutions that were responsible for the courses, i.e. in Malmö, Terschelling, Hamburg and Warnemünde, respectively.

When trying to identify – during the preparation of the METNET proposal - the most urgent training needs for the majority of lecturers at MET institutions from the meeting of which maximum benefit could be derived, two subject areas were "in competition": pedagogical skills and technology use. There are shortcomings in pedagogical skills at MET institutions as new lecturers are often not given the opportunity to attend appropriate induction courses and have to follow a learning by doing approach, at best under the guidance of an experienced mentor who decades ago also learnt to teach and assess without any organized preparation for it. There are

also shortcomings in the optimum use of modern technology for teaching and assessment and, in this context, the effective use of simulators.

The four courses developed by METNET bridge the differences between the shortcomings in pedagogical skills and technology use by contents which combine updating and upgrading in both areas, they also provide pedagogical skills in the use of modern technology for teaching and assessment. This approach will also help to narrow the training-job-gap.

METNET did not give special attention to not-technology-related pedagogy. There is a host of publications available that deal with learning psychology, development of courses for students, teaching techniques, the use of standard instructional media, assessment of students, course evaluation etc. which are for general use and can be applied to MET too.

The expected benefits from the METNET choice lie not only in the updating and upgrading of lecturers at MET institutions in the important subjects of the courses and familiarizing them with the new opportunities offered by computer-assisted learning (CAL) and computer-based training (CBT), the use of multi-media and the world wide web but also in preparing them for future use of the interactive cyberspace medium. The courses will also help lecturers to teach technical subjects more effectively and to qualify students better than now for the use of modern information and communication technology (ICT), particularly of distance learning materials. This again will facilitate it for the students to develop skills for, and a positive attitude to, life-long learning.

The two courses for simulator instructors are also a response to STCW requirements for training programmes for simulator instructors. The main aim of the two courses is however the optimal use of these expensive devices for the benefit of students.

The active involvement of simulator instructors in the development of the courses at workshops resulted in an intensive and fruitful exchange of experiences and views from which all participants profited. There is still a long way to go to an optimum exploitation of simulators for providing the most effective training possible and taking maximum advantage from it for narrowing the training-job-gap in simulator-trainable skills and competence. It is not fully clear today how the effectiveness of simulator training can be further improved as transfer of training from simulator to shipboard is not sufficiently well explored yet. (See also Recommendation 7.2.6.)

6.3 “MET-indirect” work packages and tasks – WPs 2, 4 and 3

A reasonably exact quantification and forecasting of a national shortage of ship officers for on-board and maritime on-shore positions would necessitate a specification of present and a prediction of future supply and demand, i.e. of the number of available nationals with ship officer qualifications and the number of officers needed today and in the years to come for both ships flying the flag of a country and for positions in the maritime industry ashore.

Lacking ship officers for on-board service can also be recruited from foreign countries, ex-ship officers in positions in the shore-based maritime sector are normally nationals. It is therefore more difficult to identify the national demand for on-board than for on-shore. There are national studies and sectional studies, for example, by national pilot associations which try to quantify the present and future national demand. These studies provide also information on the national supply and the national supply shortage and about the latter's expected development.

The probably best existing sources for numbers of nationals with ship officer qualifications are national data bases on seafarers which were surveyed by METNET – in WP 4 – with a view on their usefulness for specifying national seafarers supply (T 4.1), and the compatibility of their structures and their suitability for possible EU-wide use (T 4.2).

METNET did not survey national demands for ship officers because of the difficulty to provide reliable data and because of all EU countries facing a growing shortage of ship officers. Nevertheless, METNET suggests to limit the identification and specification of national demands – in a first approach - to the specification of the minimum number of ship officers required in positions in the national shore-based maritime sector and combine it with an investigation in which positions ship officers are really needed to sustain the competence and competitiveness of the shore-based maritime skills base. Only a few countries have done both parts of this task.

METNET concentrated on identifying ways and means for increasing the supply (recruitment) in WP 2. It also dealt with keeping ship officers longer on board (retention) and keeping students in MET, i.e. WP 2 dealt with ship-shore fluctuation and drop-out during or directly after MET studies (by not going on board but seeking employment ashore).

WP 2 – Evaluation of national studies and efforts for meeting the national demand for seafarers by a national supply (CETEMAR)

T 2.1 Identification of reasons for success of national approaches (France, Netherlands, Norway)
T 2.2 Evaluation of studies and efforts to attract more qualified young people to MET
T 2.3 Evaluation of national studies and efforts to retain ship officers on board
T 2.4 Identification of numbers/percentages and reasons for drop-out from MET

As can be seen from the titles of the work package and the tasks, the intention of WP 2 was not "to re-invent the wheel" but to find out what EU countries and Norway had done to increase the number of national seafarers, with emphasis on countries that were particularly successful in these efforts. Ts 2.1 and 2.2 deal with reducing and eventually solving the supply problem, i.e. increasing recruitment. Ts 2.3 and 2.4 address those who are already sailing as ship officers or are studying to become ship

officers, respectively. Positively put, they deal with retention on board and in MET studies or, negatively put, with drop-out.

The principle reasons for not wanting to go to sea (recruitment) and for not wanting to stay at sea (retention) were already presented under 3.3.1 and 3.3.2, respectively, and the main actions and measures which could and should be used to attract more young people from EU countries to, and retain them in, seafaring were listed under 4.1. The necessary actions and measures that are considered to be effective for overcoming the supply shortage are summarized under 7 MAIN RECOMMENDATIONS and 8 PROPOSED FOLLOW-UP ACTIONS. Moreover, overcoming the supply shortage is a red thread of this report so that it is not necessary to repeat the findings of WP 2. The reports on the four tasks of WP 2 include comprehensive back-up information on the reasons for the supply shortage and what could and should be done to overcome it.

The problem that has not been given satisfactory attention until now is that of drop-out during or directly after MET, i.e. students do not finish their studies or finish them but go directly in the maritime industry ashore instead on board ships to acquire at least the sea time for the highest certificate of competency.

To illustrate the size of this problem, percentages for both types of drop-out are given below from the report on T 2.4. The data are from 1998 and the source is FST, the Federation of Transport Workers' Unions, that is today ETF.

country	percentage	country	percentage
Belgium	5% - 15%	Italy	45% - 65%
Denmark	35% - 45%	Netherlands	25% - 35%
Finland	5% - 15%	Portugal	50%
France	15%	Spain	65% - 75%
Germany	15%	Sweden	5% - 15%
Greece	5% - 15%	United Kingdom	15% - 25%
Ireland	5% - 15%		

The two main reasons for "deserting" MET studies seem to be disenchantment with the profession after the first exposure to shipboard practice and difficulties in coping with academic requirements. The two main reasons for completing MET but not going on ships seem to be again disenchantment with the profession and the attractiveness of good job opportunities ashore which do not require shipboard experience. In this context, it is worth mentioning that many students in, for example, Spain, particularly female students, take up MET studies with the intention not to go to sea after graduation.

The METNET approach to preventing the loss of MET students and MET graduates is two-fold. Tests for finding out about the suitability of MET applicants for seafaring should be introduced (see also Recommendation 7.1.10) and MET students should be given an early exposure to shipboard practice (see also Recommendation 7.1.5).

WP 4 – Student and ship officer statistics (SI)

T 4.1 Survey of present MET students and ship officers statistics
T 4.2 Development of an information base for use in all countries

This WP was initially planned to cover EU countries, Iceland and Norway but was, considering their forthcoming joining, extended to accession countries and also to a few countries outside the future EU.

The authority that keeps the national register on seafarers is, according to METNET findings, not necessarily the authority that keeps a national register on MET students and graduates, provided the latter is kept at all.

The structures and contents of the normally electronically kept national seafarers' databases differ considerably.

Most national databases for seafarers cannot be used for planning purposes. They are often not up-to-date on seafarers' employment status, although this information may be available from other sources such as seafarers' national health insurance. National databases do normally also not follow seafarers' careers. However, they can often be used for identifying fraudulent certificates of competency.

METNET has recommended the development of a common structure for national databases on seafarers and has made a proposal for a structure and the information a database should contain. It has proposed to consider making the newly established European Maritime Safety Agency (EMSA) the host of a European database that would help EMSA to occupy its expected role in maritime safety. (See also Recommendation 7.3.7.)

The recently by ILO adopted Convention on Seafarers' Identity Documents (Convention No.185) provides a comprehensive response to security concerns and the necessary safeguards for individual rights. The introduction of these identity documents can also be taken as an opportunity to establish structurally equivalent national databases on seafarers and an EU seafarers' database.

WP 3 – Costs and financing of MET (ISTIEE and WMU)

MET is considered to be expensive and more expensive than most comparable ET.

In this context, METHAR had identified considerable differences in the availability of expensive equipment, such as simulators, at MET institutions that in most cases corresponded with the size of the MET institution, the number of students and staff and the range of expertise available. The substantial expenditure for the operation of sophisticated simulators, which are of essential importance for high-quality MET, has been identified as an important reason for the high costs of MET. METHAR had recommended, if applicable, the concentration of national MET resources at a smaller number of locations so that all students could be offered frequent training in simulators. METHAR also expected a national concentration of MET resources to

lead to an accumulation of expertise that could also be used for extending a reasonably-sized MET institution's range of activities and making an own income from consultancy and research work for maritime industry and administration, that, in turn, would help to keep MET programmes up-to-date.

WP 3 gives a first general understanding of the costs of MET and the origin of funds. Its results will therefore also facilitate national reviews of expenditure for MET.

The last study of costs and financing of MET was made in 1968 in the UK. The findings were supporting a concentration of national MET resources that, eventually, led to a substantial reduction in the number of MET institutions. (The author of the study was a sub-contractor to WMU for WP 3.)

The situation of MET today is, in some respects, no more comparable with that of MET in 1968. The steady decline in numbers of students has reduced the number of MET institutions, although not as much as it would have been necessary for maintaining only MET institutions of a reasonable size. Many of the remaining ones became departments or sub-departments of larger higher education establishments. Modern technology has been more and more used at MET institutions and has helped increase training effectiveness – and costs of MET.

A striking difference between MET in 1968 and MET in 2002 (the year of the report on WP 3) was the decrease in willingness and ability of MET institutions to provide figures for operational costs and funds and a breakdown of them as well as costs per student. Representatives of MET institutions admitted that they were afraid of revealing detailed information, mainly because of two reasons: they were afraid of being "pilloried" by the information being made public and confirming the high costs of MET and they were afraid of other national MET institutions, which they see as competitors for students, possibly gaining an advantage from the unilateral disclosure of financial information. This can also be interpreted as an indirect admission that MET institutions themselves consider the cost per MET student rather high and their publication likely attracting unwanted attention. On the other hand, representatives of MET departments or sub-departments explained that it would be most difficult if not impossible for them to provide figures for various cost items because of many costs as, for example, administration and maintenance costs were paid from a central institutional budget.

METNET had to find another approach to obtain information on costs and financing of MET than asking MET institutions how much they receive from whom and how much they spend on what. METNET changed its approach from trying to collect information on figures to collecting information on percentages on costs and financing. For example, no questions on figures for staff costs and public funds were put but questions on the percentage of staff expenditure as part of total expenditure and the percentage of income from public funds as part of total income. This approach worked rather well. The evaluation of the collected information allowed to draw the following main conclusions:

Financing/funds/income of MET institutions:

- Funding for MET institutions is predominantly provided from public funds – with the exception of the UK.

- The provision of funds by the industry is, with the exception of the UK, normally limited to paying for shipboard training places. (See also Recommendation 7.1.6.)

- Tuition fees for students do not exist in the majority of countries. They can provide up to 20% of the total income in countries where they are charged. (The number of countries charging tuition fees may increase in future. Already charged tuition fees may be increased.)

- Students in a majority of countries can obtain grants.

- Only a minority of MET institutions makes an own income from consultancy and research services, the number of MET institutions offering updating or upgrading courses against payment is bigger. The MET institutions making a substantial own income are normally larger MET institutions with advanced facilities and breadth and depth of expertise.

Costs/expenditure/expenses of MET institutions

- Personnel costs are the main cost item of MET institutions.

- Costs for teaching staff are normally higher than costs for administrative and other support staff although there are considerable variations in number and, consequently, costs of administrative and other support staff.

- A major cost factor for MET institutions is expenditure for the operation and maintenance of expensive simulator systems.

- Costs for the provision of on-board training places by ship owners/ship operators are in a number of countries partly subsidized from public funds.

- The main costs for students are in most cases accommodation costs. They are mostly paid from family income. It should in this context be noted that accommodation costs can be reduced or even eliminated if many students are recruited from the vicinity of the MET institution as, for example, in Greece, Italy and Norway which are the countries with most MET institutions. This concept can be combined with a concentration of more comprehensive MET resources at a smaller number of MET institutions as it is the case in Norway where a few of a considerable number of MET institutions are departments of larger higher education establishments and offer degree MET whereas the majority of MET institutions offer non-degree MET. (Upgrading from no-degree to degree MET is available.)

METNET recommends that costs and financing of MET need to be given further attention and merit further investigation with the objective of assisting in national decisions on the optimum use of national MET resources. For facilitating national decision making METNET proposes to develop a model of a cost-effective MET institution the parameters of which can be used by national funding authorities and MET institutions for identifying the costs per students for all national MET institutions and would, moreover, allow for a comparison with the costs of equivalent national technical ET. (See also Recommendation 7.2.3.)

6.4 "MET-direct" and "MET-indirect" work packages and tasks – WPs 1, 9, 10, 12, 13, 14 and 11

The report on **WP 1** Evaluation of 4th FP Projects for Exploitation in METNET was completed a few month after the beginning of METNET.

WP 9 – Establishment of principles for a common approach to certification (SI) - Issues related to seafarers in the EU

T 9.1 Survey of already existing mutual recognition of STCW-based certificates and existing certification procedures (SI)
T 9.2 Identification of prerequisites for, and design of, a common approach to STCW-based certification (SI)
T 9.3 Issues related to the mobility of seafarers in the EU (SI and FIADM, IMP, NSA, NUMAST)

As mentioned earlier, the term "certification" in the full title of METNET was in the beginning of the project replaced by "mobility" because the mutual recognition of certificates of competency is only one of some necessary pre-conditions that have to be met for establishing provisions for intra-EU mobility of EU ship officers. Another necessary pre-condition is proficiency in a common language. A third group of necessary pre-conditions for mobility is related to legal, fiscal and social issues.

METNET recommends an extended mutual recognition of certificates between EU member states on the basis of STCW minimum requirements. MET institutions in all EU countries offer, as far as shipboard qualifications are concerned, at least MET that fulfils the minimum requirements of STCW (Essentials), most MET institutions in EU countries have also Extension elements in their syllabi.

Provided mutual recognition of certificates would be no major obstacle to mobility, foreign language proficiency, i.e. in most cases proficiency in English, could be an obstacle. (See also Recommendations 7.3.3, 7.3.4, 7.3.5 and 7.3.6.)

Provided both certificate recognition and foreign/English language proficiency would be in order, there would still be a few issues that could hamper mobility of ship officers, such as:

- legal issues
- cultural and social issues, and
- economic and financial issues.

Legal issues could be national employment laws, work and residence permits.

Cultural and social issues could relate to culture and religion, food and diet, personal health, management style and could be gender issues.

Economic and financial issues could be salary differences between countries, income tax, social security, state pension, health insurance.

Obviously, there is a host of issues that may hamper mobility.

Now provided that all issues have been overcome, it would still be necessary for a ship officer who wants "to be mobile" to be able to learn about job opportunities in other EU countries (See also Recommendation 7.3.10.) and shipping companies must see an incentive in employing a foreigner from the EU.

It is obvious that – under present conditions – only a ship officer with a strong motivation for mobility will seek employment on a ship flying the flag of another EU country. Mobility is not an opportunity that he/she simply can use, it is rather an opportunity that he/she has to create by overcoming several obstacles.

What is needed is not only a paving of the way to opportunities for intra-EU mobility for ship officers which will require considerable political and administrative efforts, but also an education for mobility by, for example, exchange programmes for students and staff of MET institutions. (See also Recommendations 7.3.6 and 7.4.3.)

WP 10 – Identification and specification of benefits from improved, more harmonized and wider applicable MET (CETEMAR)

The main objective of WP 10 was to use the conclusions and recommendations of WPs 2-9, which would particularly help enhance the attractiveness of MET and seafaring for more qualified young people, and identify and, as far as possible, specify the benefits from the implementation of these recommendations. At the core of this task was a survey of job opportunities for ship officers in the maritime sector ashore. This survey was not only to cover the job opportunities that already exist but should also propose new ones. For strengthening the competence of ship officers in areas where they are traditionally employed after having come ashore and for increasing their professional mobility in the maritime sector ashore by qualifying them to occupy other positions than the usual ones, METNET recommended to develop – in the framework of the Bologna Declaration – a European MSc programme for ship officers who hold the highest certificate of competency in the deck or engine specialisation or in both specialisations and have concluded their MET studies with a BSc.

This MSc represents the 4th E for Elevation of the 4E concept of MET. The MSc programme would help qualify ship officers for managerial positions in the shore-based maritime sector. It would visibly improve the career perspectives for ship officers that, in turn, would have the positive effect of not only attracting more young people to MET and seafaring but also more of those with higher general education achievements.

METNET identified two basic approaches to the MSc:

- To prepare a framework for a maritime MSc programme for the addressees just mentioned and leave it to MET institutions to fill the framework with a MSc programme serving national preferences and implement the programme with institutional staff and external national experts in the national language.

- To have the framework and the programme prepared by a multi-national working group from universities where maritime MSc programmes are already offered, although they may not be tailored to the pre-qualification and needs of ship officers, and implement the new MSc programme at a limited number of universities in West and East Europe with institutional staff and experts from many European countries in English. (See also Recommendation 7.3.1.)

METNET favours the few-maritime-universities to the all-MET-institutions approach. The former would provide the opportunity to obtain a European MSc, the latter would provide the opportunity to obtain a national MSc. The European MSc can also be expected to have advantages over the national degree in respect of quality and mobility.

Nevertheless, whilst the creation of a European maritime MSc should be pursued, the development of national maritime MSc should be encouraged at the same time.

METNET felt that the task of WP 10 to confirm existing job opportunities and indicate future job opportunities for ship officers would require not only the chosen bottom-up approach but should be complemented by a top-down approach that would look at the maritime sector as a whole and deal with maritime personnel within this scope, regardless whether jobs are suitable for ship officers or not. Such a scoping study on the mapping of career paths in the maritime industry was therefore undertaken for the UK:

Special report: A review of the United Kingdom's marine industries skills needs and supply (SI).

This special report addressed the lack of information on the various skills issues that are currently facing the UK's marine industries. It tried to provide an overview of the state of the industry in labour market terms by

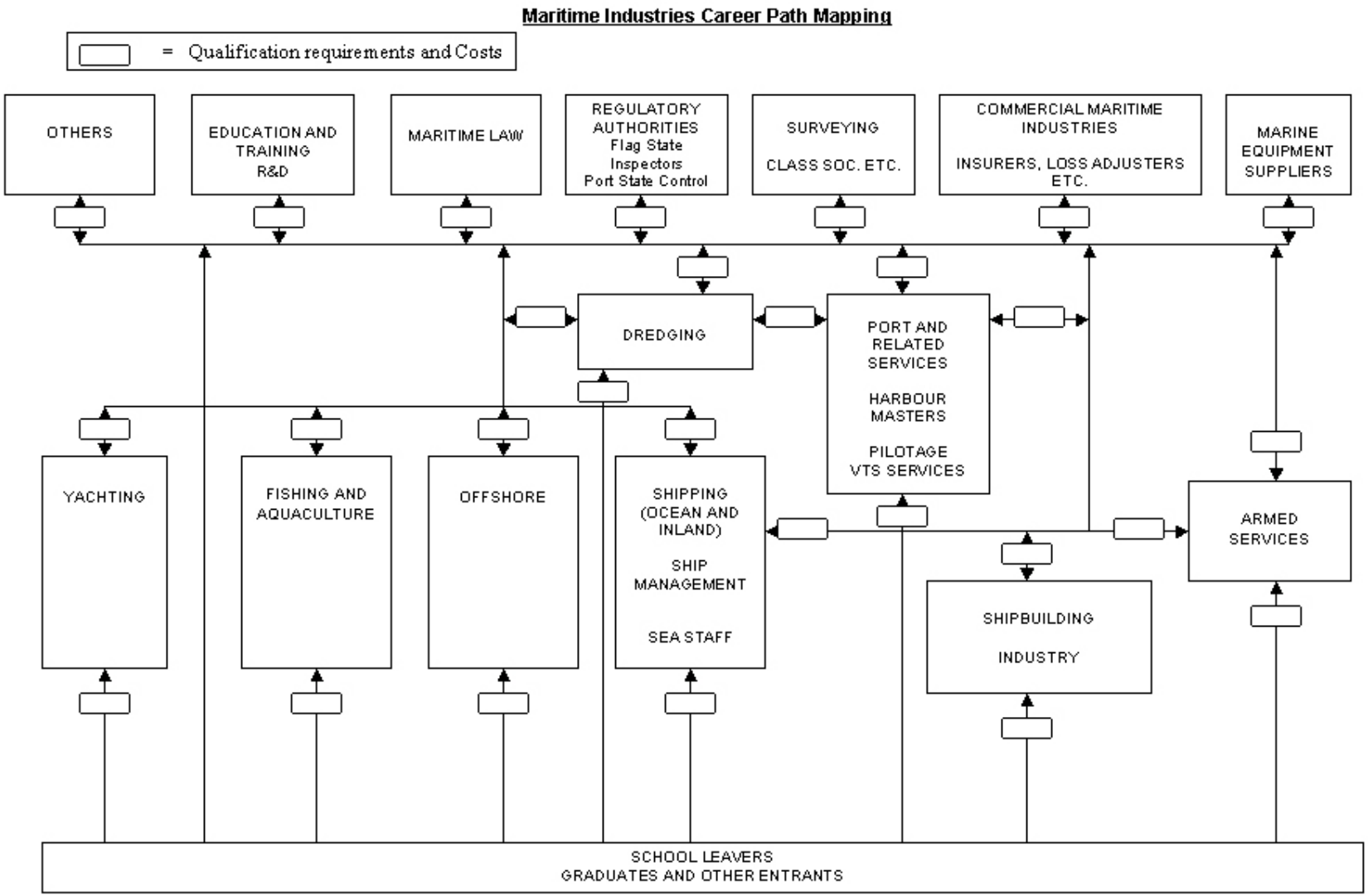
- identifying the main training bodies involved in MET,
- undertaking an assessment of the current recruitment practises and procedures in the various maritime sectors,

- highlighting present skills problems facing the maritime sectors, and
- identifying any potential areas that may arise in the future in regard to human resource supply and demand.

This scoping study can also be used for

- identifying the scope of the maritime sector and its sub-sectors,
- specifying the skill requirements and any shortages,
- confirming the training and qualifications required for each sub-sector,
- establishing the availability of training and the costs to the parties involved, namely government, employers and employees, and
- recognizing barriers to the mobility of employees between sub-sectors.

On the following page a diagram is given that provides an overview on career path mapping in the maritime industries.


Maritime Industries Career Path Mapping
= Qualification requirements and Costs
OTHERS
EDUCATION AND TRAINING R&D
MARITIME LAW
REGULATORY AUTHORITIES Flag State Inspectors Port State Control
SURVEYING CLASS SOC. ETC.
COMMERCIAL MARITIME INDUSTRIES INSURERS, LOSS ADJUSTERS ETC.
MARINE EQUIPMENT SUPPLIERS
DREDGING
PORT AND RELATED SERVICES HARBOUR MASTERS PILOTAGE VTS SERVICES
YACHTING
FISHING AND AQUACULTURE
OFFSHORE
SHIPPING (OCEAN AND INLAND) SHIP MANAGEMENT SEA STAFF
ARMED SERVICES
SHIPBUILDING INDUSTRY
SCHOOL LEAVERS GRADUATES AND OTHER ENTRANTS

This comprehensive top-down approach to maritime personnel and career path mapping, in combination with the previously mentioned ship officer-confined bottom-up approach, would be suited for European policy decisions. It would be advisable to undertake such scoping studies in other countries too (See also Recommendation 7.3.1.), also in order to identify commonalities and differences between countries so that policy decisions can be taken on a broader basis. The results of the bottom-up approach are already based on common findings for all countries although there is some variation in the degree to which these findings apply in the individual countries.

Career path mapping supports also two other findings of METNET, namely that there may be more employment opportunities for ship officers in the maritime industry ashore than the traditional ones and that there are opportunities for other personnel that already works in the maritime sector as, for example, officers on fishing vessels and in the navy to be re-trained as ship offers on merchant marine vessels. Existing upgrading possibilities for ratings fall also in this category. (See also Recommendation 7.1.11.)

Moreover, women are a rather untapped personnel resource for the maritime sector and their recruitment should be promoted. (See also Recommendation 7.1.12.)

The actual and planned dissemination and exploitation activities are described in the report on **WP 12** Exploitation, dissemination and IPR (AMRIE and WMU). Some details are given in the following chapter 6.5.

The activities of **WP 13** Extension of the network (WMU), T 13.1 Workshops with East European countries and T 13.2 Workshops with non-EU Mediterranean countries, were initially designed as a kind of information outlet on METNET and "listening post" to MET in East European and non-EU Mediterranean countries. They became during the course of the project increasingly interactive and valuable for METNET. The communication, above all that with the East European countries, gradually intensified and developed into a learning experience for both West and East European MET. (See also "Portoroz Resolution" under 8.1.) (A similar resolution was adopted by the representatives of non-EU Mediterranean countries in Lisbon: "Lisbon Resolution".)

The main recommendations and proposed follow-up actions of METNET are presented in a wider explanatory context in **WP 14** Recommendations for policy and decision makers (WMU). The main recommendations and the proposed follow-up actions to METNET are included in this report under chapters 7 and 8.

The basis for **WP 11** Network management and coordination (WMU, in cooperation with AMRIE, CETEMAR and SI) was ready at the beginning of the project in the form of a Network Manual.

6.5 Dissemination of results – METNET Days

It is recommended in 8.1 what should be done to further prepare and facilitate an optimum exploitation of METNET results and that the by METNET established **involvement approach** should be continued, i.e. those who have taken part in the development of syllabi and courses by making comments and participating in workshops, respectively, should be kept together in networks of managers and specialists of MET institutions and be enabled to continue their work for the optimum exploitation of METNET results. These persons should not only endeavour to take maximum advantage from METNET results for their MET institutions but should also act as multipliers in their countries by disseminating METNET results to other national MET institutions, if any, and other national stakeholders in MET.

The national dissemination of METNET results is occasionally hampered by the attitude of MET institutions participating in METNET to other MET institutions in their countries. METNET results were occasionally treated as privileged knowledge by a MET institution that participated in METNET. This attitude is probably a reflection of national MET institutions seeing each other as competitors for the limited number of national students. In a few countries the availability of METNET results in English appears to complicate dissemination.

METNET has pursued national dissemination through national participants and made efforts to make them most inclined to taking care of national dissemination by involving them as much as possible in the development of syllabi and courses.

For the syllabi the “iterative approximation” approach was used and for the courses the “catalyst workshop” approach. Both are explained in 5.2.

In a final dissemination step before the end of the project so-called national METNET Days were held in:

Espoo near Helsinki for Finland and Estonia
Paris for France
Hamburg for Germany
Piraeus for Greece
Trieste for Italy, Croatia and Slovenia
Utrecht for the Netherlands and Belgium
Gdynia for Poland
Barcelona for Spain and Portugal
Gothenburg for Sweden
Newcastle for the UK.

Almost 230 representatives of MET institutions and other stakeholders in MET participated in these METNET Days.

The concept of a METNET Day was the following:

METNET Days

Does the EU seafarer continue to be an endangered species?

The concept of the METNET Day is national. Although the invitation to it should be country-wide, the METNET Day should be held in cities where the maximum number of national stakeholders in MET resides. Except for the presentation of METNET and METNET results, for which English will mostly be used, the discussion can be conducted in the national language. The identification of a relation between METNET/ METNET results and national MET/the national maritime skills base is encouraged and should be sought. METNET Days should therefore also be national MET Days and involve national stakeholders in MET. The duration of a METNET Day should at least be four hours.

A METNET Day is an important part of the dissemination effort for METNET but should also be used to obtain appreciation and acceptance of METNET results and help carry METNET further forward with a view on increased recruitment and a sustainable supply of national ship officers and the sustenance of a competitive national maritime skills base as well as additional appropriate measures and awareness campaigns to achieve these objectives.

Audience: Stakeholders in MET, i.e. those who are concerned with or interested in MET and a sustainable competitive national maritime skills base.
General objectives:

- *to present and discuss information on METNET and METNET results,*
- *to discuss the relevance of METNET and METNET results to national MET and the national maritime skills base.*

Specific objectives:

- *to present and discuss METNET's 4E concept (Essentials – Extension-Enrichment-Elevation), and help specify the 4th E (Elevation),*
- *to identify and promote additional approaches to overcome a possible national supply shortage,*
- *to increase the awareness for careers in the maritime sector,*
- *to discuss the way forward after METNET.*

The programme of all METNET Days should cover the following topics (and discuss them):

1 Introduction to and overview of METNET.

2 Description of specific work package(s) or task(s) and its (their) outcome(s), taking into account national interest.

3 Explanation of the 4E concept and presentation of proposed contents for MSc/MBA course.

4 Presentation(s) by national MET institution(s).

5 Presentations by national MET stakeholders from industry, administration, professional associations etc.

6 Suggestions for an awareness campaign should be invited.

Two METNET leaflets – one on the project as a whole and one on the developed syllabi and courses were prepared and widely distributed. Two electronic METNET Newsletters were produced and disseminated to about 1,500 addresses.

The METNET dissemination was pursued with the objective exploitation already in mind.

METNET or parts of it have, beginning in 2001, also been presented at international maritime conferences as, for example, in Bilbao, Bremen, Brussels, Naples and Turku, and at national maritime conferences in order to inform appropriate audiences about the project or parts of it and invite comments on concept, approach and first results.

The METNET dissemination activities will be continued as follows:

All deliverables on work packages and tasks will be displayed on the METNET website (http://www.metnet.info) together with other records on METNET activities. All syllabi, courses and English language back-up materials have now been compiled on a CD ROM that will be posted to all METNET participants and will be available to others on request.

The following post-METNET publication strategy will be pursued:
METNET participants will be asked to use this report or parts of it and any deliverable of their choice for publications on METNET in national maritime journals (in the national language) which elaborate on own participation in, and benefits from, METNET for national MET. Not only METNET results should be further disseminated by this approach, the publications should also help stimulate discussions on the efficiency and effectiveness of national MET.

There will be publications on METNET or parts of it in international maritime journals too. They will also cover concrete follow-up activities to METNET which may be realized in the context of the Maritime Transport Coordination Platform in the 6th RTD Framework Programme.

7 MAIN RECOMMENDATIONS FROM METNET

Priority recommendations are in bold

7.1 Recommendations on increasing the recruitment (supply) and retention of seafarers – joint tasks for MET institutions, industry and administration

.1 Appropriate and engaged efforts should be made to improve the image of the shipping industry. This objective should be pursued by the industry and through governmental and non-governmental international organisations but also on the national level (ref 8.2.1.1).

.2 Seafaring should be promoted as part of an attractive career in the maritime sector. A European Union and national awareness and promotion campaigns should be launched. They should emphasize the advantages of a career in the maritime sector including employment prospects (career paths), (ref 8.2.1.1).

.3 The planning of awareness and promotion campaigns should take into account the perception of seafaring by active seafarers and by ex-seafarers employed in the maritime sector ashore. This information can best be collected by a survey that should also comprise potential candidates for seafaring (ref 8.2.1.1).

.4 Promotion of careers in the maritime sector should begin as early as in secondary schools (ref 8.2.1.1).

.5 MET programmes should be arranged in a way so that students can be given an early exposure to life on board a ship, at least on a training vessel. This would allow MET students to find out whether they made an appropriate choice of career and, if not, would save MET capacity and costs and future disappointment and dissatisfaction for those who dislike shipboard life (ref 8.2.1.2).

.6 More on-board training places should be made available by ship owners/ship operators so that MET students can complete their training for a certificate of competency. This recommendation should be seen in context of possible incentives for those who provide on-board training places and, in a wider context, the provision of incentives for the flagging back of ships to a flag of a EU country (ref 8.2.1.1).

.7 Working and living conditions on board should be further improved, including the design of ships in respect of accommodation, living and working environment (ref 8.2.1.1).

.8 Shipboard life should be made more attractive by providing opportunities for distance learning and, at least equally important, by facilitating the use of modern ICT (Information and Communication Technology) for keeping in contact with family and friends ashore (ref 8.2.2.6).

.9 Competitive salaries should be paid to shipboard personnel – competitive in comparison to salaries ashore (ref 8.2.1.1).

.10 Tests should be developed for identifying the suitability of MET applicants for seafaring (ref 8.2.1.2).

.11 Personnel that is already pre-qualified for work on merchant marine vessels should be offered additional training for becoming ship officers. This applies to officers on fishing vessels and in the navy as well as to ratings on merchant marine vessels (ref 8.2.1.3).

.12 The employment of women in the maritime sector should be promoted and encouraged (ref 8.3).

.13 Degree-MET and non-degree MET should be offered in each country so that young people with different qualifications in general education can enter seafaring (ref 8.2.1.1).

.14 The entry to non-degree MET should be made more attractive by providing opportunities for upgrading to degree MET (ref 8.2.1.1).

7.2 Recommendations on improving the quality and employability of seafarers – tasks for MET institutions

.1 The network of MET institutions developed by METNET should be kept together on a pan-European level, the accession states should be included in it as equal partners (ref 8.1).

A core network of a senior MET representative per country from EU and accession countries should suffice to maintain a substantial part of the momentum created by METNET and should take, together with specialists from the MET institutions involved, a leading role in the exploitation of the by METNET developed courses at their own MET institution and other national MET institutions, if any (ref 8.1).
This core network of senior management staff from MET institutions should also serve as advisory group to the Marine Transport Coordination Platform and for the identification of new MET needs.

.2 The optimum use of national MET resources should be made a matter of priority for all stakeholders in MET, i.e. MET institutions, maritime industry, maritime and education authorities, trade unions, professional associations, research institutes specialized in MET-relevant subjects (ref 8.2.2.4).

.3 National authorities, which provide funds for MET, should approach the matter of MET costs in two ways:

First, they should compare the costs per student at MET institutions with costs per student in equivalent technical ET.

Second, a model for Europe-wide use should be developed of a cost-efficient MET institution that can, because of extended activities, serve as a centre of maritime excellence and even make an own income. National authorities should then add costs to this model and compare the overall costs of this institution with those of present MET.

This double approach will help decide on the optimum organisation of national MET (ref 8.2.2.4).

.4 MET institutions should make continuous efforts to review the validity of existing syllabi with a view on updating of subjects in both content and time allocation. They should use possible gains in time from subjects which have become less important or even obsolete for allocating more time to subjects which need more attention or are even new. The presently available overall time for MET programmes leading to unlimited certificates of competency and BSc degrees should not be exceeded (ref 8.2.2.2 and 8.2.2.4).

.5 Within the efforts to make MET as efficient and as effective as possible, special attention should be given to enabling ship officers to meet new demands on board, such as increased administrative duties, small and multicultural crews and other new developments influencing the performance of crews. Moreover, leadership skills should be included in updated syllabi (ref 8.2.2.2 and 8.2.2.4).

.6 An investigation into the effectiveness of simulator training would help to improve the quality of training and optimize the use of this expensive equipment (ref 8.2.2.3).

.7 Teaching (and research) staff at MET institutions should seek a close communication and cooperation with industry and administration for keeping themselves up-to-date of developments in the maritime sector and for keeping their ability to offer consultancy and research services – for making themselves more useful for the maritime sector and for earning an income for their institution (ref 8.2.2.2 and 8.2.2.4).

.8 Modern technology should be put to greater use in MET and MET students should be made computer-literate and as well as possible prepared for the use of modern technology on shipboard (ref 8.2.2.6).

The by METNET developed courses for maritime lecturers in modern technology use in teaching and assessment should be presented and discussed in workshops with experts in the respective course subjects from MET institutions which did not participate in METNET. The same applies to the by METNET developed courses for shiphandling/navigation simulator instructors and engine room simulator instructors and also to the course on marine environment protection (ref 8.1).

.9 Pan-European working groups should be formed by those who participated in the workshops for the above-mentioned courses. The members of the working groups should take care of updating the courses and play a leading role in their exploitation at their own and other national MET institutions, if any (ref 8.1).

.10 MET students should be made familiar with distance learning programmes during their studies. Existing distance learning programmes should be evaluated for their suitability on shipboard and new programmes developed, preferably for updating so that ship officers can use such updating programmes on board at their own pace (ref 8.2.2.6).

.11 More attention should be given to strengthen the development of a commitment to safety by appropriate syllabus provisions. Safety culture should be continuously promoted so that it becomes an integral and ingrained part of maritime operations. Lessons learnt from accident investigations should be taken into account when developing approaches to a better safety culture (ref 8.2.2.5).

In this context security should be given more attention so that the requirements of the new ISPS Code are fulfilled (ref 8.2.2.5).

7.3 Recommendations on facilitating the mobility of seafarers – tasks for MET institutions and administrations

.1 A European MSc degree programme for ex-seafarers with unlimited certificates and a BSc or equivalent degree should be developed that would allow them to qualify for senior positions in industry and administration. Career paths mapping should be continued in national approaches (ref 8.2.1.1 and 8.2.2.1).

.2 Ideally, there should be a 3 to 4-year test of the by METNET developed common syllabi at a few MET institutions in different countries. The further development of the common syllabi as well as their test should be monitored by the pan-European group of senior MET representatives, who are to maintain the momentum of METNET, and, if necessary, pursued with the support of experts in the different syllabi subjects from their MET institution

A credit system for modules of syllabi and, consequently, for entire syllabi should be introduced in line with the European Credit Transfer System.

.3 Textbooks for Europe-wide use at MET institutions should be developed (ref 8.2.3.1).

.4 A more frequent use and, ideally, the only use of English as teaching language at MET institutions in no-Anglophone countries should be promoted (ref 8.2.3.2).

Appropriate texts in English on maritime subjects should be compiled and be made available at a dedicated website (ref 8.2.3.2).

.5 A qualification profile for English and Maritime English lecturers should be developed (ref 8.2.3.2).

.6 The exchange of lecturers and students between MET institutions should be intensified and additional subjects for cooperation be identified, preferably in bilateral efforts (ref 8.2.3.2).

.7 Data bases on national seafarers should be made structurally equivalent in EU and accession countries, so that data exchange on seafarers between countries is facilitated. The creation of a European data base for seafarers should be seriously considered and whether this would not be a task for the newly established European Maritime Safety Agency (EMSA).

.8 The bilateral recognition of certificates of competency should be extended in order to achieve "full" coverage of all EU and accession countries. A European certificate of competency should be created.

.9 The issues of national fiscal arrangements for ship owners/ship operators and tax and social security payments for seafarers need to be addressed by the competent authorities with a view on enhancing mobility of seafarers within Europe.

.10 A free-to-all European internet site is required for offering information on job opportunities for seafarers. This website should provide linkages to national websites serving the same purpose.

7.4 Recommendations on the involvement of accession countries

.1 As requested by representatives of MET institutions and maritime administrations of East European and Mediterranean accession countries in the Portoroz and Lisbon Resolutions, respectively, the courses for MET lecturers and simulator instructors developed by METNET should also be presented and discussed in workshops for the in the respective subjects pre-qualified staff members of MET institutions in accession countries which participated in METNET (ref 8.1).

.2 The present EU approach to the maritime skills base should be extended to a pan-European approach and accession countries should be treated as equal partners in future MET/human resources projects (ref 8.1).

.3 A closer cooperation between MET institutions in EU countries and in accession countries should also be pursued by bilateral academic collaboration programmes which include the exchange of lecturers and students (ref 8.1).

8 PROPOSED FOLLOW-UP ACTIONS TO METNET

Priority actions are in bold

8.1 From dissemination to exploitation of METNET results – the need for a pan-European approach

Objectives: using the METNET momentum for strengthening the pan-European cooperation in MET, exploiting METNET results and pursuing follow-up activities to METNET.

Making materials produced by METNET available to all MET institutions in Europe does not imply that they will also be used. There is a major gap between dissemination and exploitation and the former is not more than a necessary prerequisite for the latter.

METNET has worked on developing a positive attitude to, and encourage exploitation of its products (and pursuance of its recommendations) by involving those in the development of the syllabi and courses who are expected to use them and organizing workshops on the courses with these experts for discussing and improving the courses and creating support to them. (See also 6.5 Dissemination of results.) This is as far as courses can be prepared for exploitation. The final step, the use of the model syllabi and courses, has to be taken by each MET institution.

Ideally, syllabi and courses should be implemented, as they were the result of cooperative efforts by experts of leading MET institutions. Normally, a “rub-off effect” can be expected to take place, i.e. a MET institution compares the relevant parts of its programme with the model syllabi and courses prepared by METNET and adapts them to what may be seen as better in the METNET than in the own programmes. This exploitation stage has not been reached yet as it will take more time and efforts to overcome the often existing reluctance to change at MET institutions.

The METNET network can not only - as it did – take the role of developing model courses and syllabi for common use but can also serve as catalyst to the exploitation of its products. Lack of funds would lead to a discontinuation of meetings of those willing to participate in the updating of the already specified syllabi and courses, interested in the development of new courses (for which METNET identified a need), and concerned with their national dissemination and exploitation. This would considerably weaken the momentum created by METNET and the readiness and commitment to take the METNET results seriously and consider them as good practice with exemplary value for MET institutions.

During METNET, representatives of MET institutions from the 13 EU countries with MET, Iceland, Norway, 9 accession countries with MET and 5 non-accession countries (Croatia, Egypt, Israel, Morocco and Turkey) could report about the discussion of METNET concepts and results at their MET institutions and exchange experiences and views with colleagues on the continued

development of existing MET programmes and their use. The meetings facilitated communication, raised interest in METNET and MET in other countries and generated a sense of belonging to a Network of Excellence consisting of colleagues and friends having similar problems and aiming at meeting the same professional objectives: continuously improving MET, making it more efficient and more effective, more widely applicable and, last but not least, more attractive for a larger number of well qualified applicants. By this feeling and even pride of sitting in the same boat and rowing towards the same destination, a momentum was created that will help MET in Europe to grow together to the benefit of all those concerned with, and involved in, MET, i.e. to the benefit of all stakeholders in MET.

With the end of METNET and the present absence of meetings and workshops a three-year engagement in building up a functioning network is in jeopardy if the momentum is not maintained and the network is not provided with opportunities to continue its work. Three years are not enough to improve an education and training system that is characterized by tradition and reluctance to change. Many more efforts over a longer period are required to bring about the necessary changes and let West European and East European MET grow together.

In brief, the value of the during METNET created network lies, among others, in its role as catalyst in

- **the exploitation of METNET results;**
- **the improvement of MET in all Europe, and,**
- **the bringing together of West European and East European MET.**

The network should, probably after two more three-year periods, be able to continue with reduced financial support. For the time being however the network needs continued funding, at least for biannual **meetings of the senior managers at MET institutions and for annual meetings of groups of experts. In the context of the network, particular attention should be given to bringing MET in accession countries on par with MET in EU countries in respect of METNET by offering to them the workshops from which experts at the MET institutions in EU countries, which participated in METNET, already profited.**

The following three steps are recommended for maintaining and strengthening the momentum created by METNET and to take maximum advantage from the network:

1 The four courses

- **on marine environment protection,**
- **on use of modern technology in teaching and assessment (merger of two courses),**
- **for shiphandling/navigation simulator instructors, and**
- **for engine room simulator instructors**

should be presented and discussed in a workshop each with experts in the respective subjects from accession countries.

2 The four courses should also be repeated and discussed in workshops for experts from other MET institutions in West Europe who did not participate in METNET or its Reference Group of MET institutions but have shown interest in the courses.

(A repetition of the four above-mentioned workshops is not necessary for East European accession countries as the number of MET institutions in these countries is small compared to the number of MET institutions in the majority of West European countries.)

3 Members of a core network have already been identified for the 15 West European countries and the 7 East European and 2 Mediterranean accession countries. Each country is represented by a person who is in a good position to further the exploitation of METNET results on the institutional and national level. All are well qualified to take part in, and actively contribute to, future developments of European MET.

This core network should, coordinated by World Maritime University, meet twice a year, once at a MET institution in West Europe and once at a MET institution in East Europe. Members in the core network are responsible for national exploitation efforts of METNET results for which they will receive support from the coordinator and the other participants. The core network will also elaborate proposals on necessary activities for improving MET and the competence, competitiveness and sustainability of the European maritime skills base and act as advisory group to the Maritime Transport Coordination Platform. Moreover, the core network will be involved in the preparation of teaching programmes for Europe-wide use and other activities mentioned under 8.2. The groups of experts who met at workshops for discussing the courses will be maintained for the above-mentioned 4 courses and extended to participants from accession countries.

Actions 1, 2 and 3 will ensure that:

- **accession countries benefit from METNET results as much as EU countries;**
- **MET institutions in EU countries which were not partners in METNET will profit from METNET;**
- **pan-European groups of experts will be formed who will keep the courses up-to-date, help with their exploitation and ensure that West and East European expertise in important subjects will be brought together and made available to all European MET institutions;**

- **a second layer of experts will be established in addition to the top layer of managers at MET institutions. The network will be strengthened for promoting exploitation of METNET results and developing new projects which would bring MET further forward.**

The above-mentioned proposals are supported by a resolution of East European representatives of MET institutions and maritime administrations that was adopted at a meeting in Portoroz, Slovenia, on 15 June 2002. The full text of this resolution is given below.

(There exists also a similar resolution by MET representatives of non-EU Mediterranean countries that was adopted in Lisbon on 20 April 2002.)

The "Portoroz Resolution" of East European countries (and the similar "Lisbon Resolution" of non-EU Mediterranean countries) show the interest that METNET has created in East European (and non-EU Mediterranean countries) and the wish to benefit from METNET results and to stay involved in follow-up activities to METNET.

"Portoroz Resolution"

Resolution
adopted
by senior representatives of MET institutions and maritime administrations in East European accession countries
on the need and requested future funding
for the continuation of communication with senior representatives of EU MET
and its extension to cooperation
in Portoroz on 15 June 2002

We, the participants from Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Romania and Slovenia would like to express our profound gratitude to the European Commission for having provided funds within the METNET project budget for meetings in Malmö, Sweden; Gdynia, Poland and Grado, Italy/Portoroz, Slovenia at which we could, under the excellent coordination of World Maritime University, meet with senior staff involved in or concerned with MET from EU countries, Iceland, Norway and Poland. We have found these meetings most useful for exchanging knowledge, experiences and views on professional subjects of common interest and for obtaining latest information on developments of MET that we could take home with us and implement, finances permitting, at our national MET institutions. We have also found the work done by METNET most interesting and often also applicable to and useful for our national MET.

We should not hesitate to add that our colleagues from EU countries have told us repeatedly that also they have benefited from exchanges with us and have occasionally learnt to see their difficulties with national MET in an even wider perspective than METNET has already provided them with.

As we understood, funding for “our” meetings will cease with the end of METNET in March 2003. We would deeply regret if this would happen.

Considering the direct “human contribution” to about 80% of all maritime accidents and the percentage being even greater when the indirect human contribution to maritime accidents is also accounted for,

being aware of the possible substantial reduction of the number of these accidents by more efficient and more effective MET,

taking into account that ships with officers educated and trained in EU countries, Iceland, Norway, Poland and other East European accession countries ply the waters of Europe, and

appreciating the usefulness of “our” meetings with a view on improving MET standards and, consequently, avoiding maritime accidents and the pollution of the marine environment,

we would kindly ask the METNET coordinator World Maritime University (where students from almost all our countries studied or study) to approach the European Commission with the request to consider the continuation of funding for “our” meetings after the end of the METNET project favourably.

We would greatly appreciate if we were given the opportunity to use results from the METNET project at our national MET institutions.

We are very much interested in the provision of the courses for lecturer colleagues at our MET institutions which were developed under Work Packages (WPs) 6, 7 and 8 so that the communication at our meetings will be extended to cooperation with other colleagues, with the further aim of exchanging lecturers and students and the ultimate aim of creating a pan-European Network of Excellence of maritime academies and universities and other stakeholders in MET.

Our national MET standards would also benefit from an access to the results of WP 5 and, with a view on the future, we would also like to continue exchanges on subjects which METNET is covering by WPs 9 and 10.

There are also a few specific areas to which we would like to draw attention and from which we would expect benefit for MET in both our regions.

We would like to stress the importance of the ISM Code for safety and environment protection, which requires special attention of MET to training those concerned with the Code and to facilitate and promote its implementation.

We suggest that programmes are developed for preparing ship officers for work in multi-cultural, multi-national and multi-lingual crews.

We also suggest supporting maritime English teachers in improving their qualification.

We would appreciate if the opportunities offered by modern IT would be further explored, with a view on both facilitating communication between MET institutions and developing distance learning programmes for use on ships and on shore.

All our proposals are made with the objectives safer shipping and cleaner oceans, a more efficient, more effective and more competitive waterborne transport in mind and the sustainable provision of personnel who are able to pursue these objectives and provide the required high-quality services.

We would be most grateful if WMU would present this resolution to the European Commission's Directorate-General for Energy and Transport and would seek financial support to the implementation of our proposal to continue and extend an already successful and highly appreciated activity and develop it into a Network of Excellence.

8.2 Specific priority actions for further enhancing attractiveness of seafaring, improving MET quality and facilitating professional mobility

The following proposed actions have been selected from numerous proposals for actions made during METNET. Main selection criteria for the listed priority actions were the strength of support for these actions from the METNET participants who based their support on the expected positive impact and the urgency of the actions. All proposed actions are in line with the Commission objective of a sustainable European maritime skills base that ensures competence and competitiveness in a global context and provides employment for European citizens.

The actions address, roughly in this order – the increase in the number of European seafarers (supply), the enhancement of MET standards (quality) and the improvement of employability within the maritime sector and Europe (mobility). As indicated above, the list is by no means complete but is a selection of the actions, which are expected to be effective in producing positive medium-term results and are needed urgently.

8.2.1 Increasing the attractiveness of seafaring

8.2.1.1 Launching an awareness and promotion campaign for employment in the maritime sector

Main objective: increasing the number of European ship officers.

Opportunities offered to qualified young people by a career in the maritime sector are not well known.

Interest in seafaring is negatively affected by the poor image of the shipping industry that normally appears with reports on major accidents, particularly oil spills, in the media. There are hardly any visible efforts to promote the positive aspects of working in the maritime sector and to show the importance of the maritime sector for the national economy.

Careers in the maritime sector, which begin with seafaring, have to be promoted as attractive careers. Such a promotion should begin in schools, should use print media, Internet and TV. Potential candidates should be informed about the positive as well as the negative aspects of seafaring. The great benefit from making shipboard experience before changing in a shore-based position in the maritime sector should be stressed. This should all be part of an awareness and promotion campaign on employment opportunities in the maritime sector.

An investigation into the perception of seafaring by seafarers and ex-seafarers would help prepare and focus this recommended (and necessary) awareness and promotion campaign. Such investigation should also comprise the perception of seafaring by potential MET candidates.

The present perception of a tarnished image of the shipping industry is partly held and spread by those engaged or having been engaged in the maritime sector but more so by the media. Potential candidates for seafaring should be enabled to form their own opinion of seafaring and the industry not only by learning about them from maritime personnel and the media. Appropriate media should, among others, be used to "counterbalance" the negative impression of the shipping industry they tend to provide.

METNET references: WPs 2 and 10

Actions: survey of perception of seafaring and the maritime sector by ship officers, ex-ship officers (working in the maritime sector ashore) and potential MET candidates; development of an action plan for a European awareness and promotion campaign on employment opportunities in seafaring and the maritime sector ashore.

8.2.1.2 Developing a test for personalities who can be expected to have "sea stability"

Main objective: increasing the number of European ship officers.

Efforts to attract more qualified people to seafaring are normally concentrated on identifying and weakening and, ideally, overcoming the reasons for insufficient interest in seafaring and the reasons for wanting to leave and leaving the sea.
The questions most frequently asked today are: Why do they not want to go to sea? Why do they not stay at sea?

There are however seafarers who stay at sea. Why did they go to sea? Why did they stay at sea?

The time has come to approach the challenge of increasing the number of European ship officers

- **less from a negative standpoint: why** (do young qualified people) **not** (go to sea) **?**

- **but more from a positive standpoint: why** (do some young qualified people go to sea) **?**

Seafarers who have stayed on board ships for 10 years or more should be asked for their reasons for going to sea and staying there. The results of such an investigation could be used to promote the good aspects of seafaring to potential applicants and, particularly, to identify the suitability of MET applicants for seafaring and describe basic features of a "sea-stable" personality. Both results could be used to provide more focus on awareness and promotion campaigns and enhance their effect.

METNET references: WPs 2 and 10

Action: identification of the concept of "sea-stable" personalities with a view on the development of a test for the suitability of MET applicants for seafaring.

8.2.1.3 Retraining officers on fishing vessels and navy officers for the merchant marine and upgrading ratings on merchant marine ships to officers

Main objective: increasing the number of European ship officers.

The shortage of ship officers in EU countries could partly be reduced, although probably not overcome, by retraining or upgrading persons to ship officers who have already obtained shipboard experience. Such "candidates" for ship officers on merchant marine vessels are officers on fishing vessels, in the navy and ratings on merchant marine ships.

The existing national retraining and upgrading possibilities for these three groups of sea-going personnel should be identified and specified and, if necessary, appropriate retraining or upgrading programmes be developed. The findings of this feasibility study should be used in the awareness and promotion campaign.

METNET references: WPs 2 and 10

Action: survey of existing national possibilities for retraining of fishery and navy officers and upgrading of ratings, feasibility study on extension of these possibilities and, if applicable, initiation of, and support to, development of additional national retraining or upgrading programmes.

8.2.2 Improving the quality of MET

8.2.2.1 Mapping career paths and developing a European MSc degree programme for holders of unlimited certificates of competency and BSc or equivalent degrees

Main objectives: increasing the number of European ship officers, improving the employability and professional mobility of MET graduates.

Career paths mapping has been conducted by METNET for the UK and is seen by those involved in or concerned with MET as a useful instrument and as a valuable support to an awareness and promotion campaign for seafaring. The extension of this approach to other countries – by so-called scoping studies – can be expected to help draw attention of young qualified people to the benefits of a career in the maritime sector.

METNET consortium and reference groups are in agreement that the offer of European MSc studies to holders of master mariner or chief engineer certificates and BSc or equivalent degrees will add to possible career paths in the maritime sector and enhance the attractiveness of the profession. Seafarers who want to obtain a MSc or equivalent degree today would in almost all EU countries have to change to totally different subjects than those in which they have obtained their first degree and mostly have to begin in a BSc programme again. There is, on the other hand, a need for such better qualified former seafarers in management positions in the maritime sector.

This MSc degree for former seafarers represents the 4^{th} E (Elevation) of the 4E concept of MET (see also 6.1 The 4E concept of MET). It should be offered at a university in a EU country at a time; it should be offered in English by the best experts in matters maritime from all Europe from academia, administration and industry. Its syllabus should contain a European bias and it should be developed in line with the Bologna Declaration as a 3-year plus 2-year or twice 1-year programme (of which he first three years represent BSc studies at a MET institution).

An expected and desired side effect of such MSc programme is that it will eventually have a positive influence on quality standards.

METNET references: WPs 2 and 10

Actions: conduct of national “scoping” studies and development of European MSc programme.

8.2.2.2 Specifying training programmes in administration, management and leadership for senior shipboard personnel

Main objectives: enhancing the quality of MET, improving the employability and professional mobility of MET graduates.

Ship officers are today not sufficiently well trained in administrative and organisational matters and in leadership skills. MET is normally focussed on creating technical experts and provides for little exposure to subjects which deal with techniques to make maximum use of knowledge and competence in positions of higher responsibility. In brief, MET consists mainly of “what” subjects and lacks “how” subjects. Although bridge resource management is taught at a minority of MET institutes, there is a distinct absence in syllabi for subjects like presentation skills, performance evaluation of personnel, negotiation techniques, team work and other methodologies which help make a ship officer a manager (and a leader).

Managers (and leaders) on board ships have only in a limited number of cases received training in dealing with small crews, multi-cultural crews, the negative effects of short lay times in ports, solitude and other factors affecting the performance of crews and the safety of vessels.

Especially the dealing with multi-cultural and consequently also mostly multi-lingual crews is a task for which already MET students should be prepared (see also FP 4 project MARCOM, The Impact of Multicultural and Multilingual Crews on Maritime Communications).

This need for a preparation during MET studies applies to training in administrative skills too.

MET institutions, in consultation with the industry and, if necessary, support from institutes experienced in teaching management and leadership skills, should be able to offer such knowledge- and competence-enhancing programmes to their students and graduates and improve their performance on board ships.

METNET references: Ts 6.2, 6.3, 6.4 and 6.5

Action: development of courses for Europe-wide use.

8.2.2.3 Enhancing the effectiveness of simulator training for ship officers

Main objectives: enhancing the quality and effectiveness of MET.

In FP 4 the Commission funded the project MASSTER, Maritime Standardised Simulator Training Exercise Register. In FP 5 METNET developed courses for shiphandling/navigation simulator instructors and engine room simulator instructors, respectively. These courses will also cover the use of simulators for assessment purposes so that MET students or ship officers can demonstrate their level of competence.

What is missing to be able to make full use of simulators is knowledge about the effectiveness of simulator training, e.g. how well simulator experience is transferred to shipboard. Only a good understanding of the transfer of training from the simulator to shipboard reality will allow simulator instructors to make optimum use of these

expensive training tools. Research into the effectiveness of simulator training will have to identify the elements that facilitate a transfer of training and to what degree such transfer takes place under which combination of elements.

Appropriate findings of learning theory and the acquisition of skills will have to be applied to simulator training. Eventually, so-called effective exercises will have to be developed, i.e. simulator exercises, which provide maximum benefit for the trainee.

The subject requires the inclusion of research and development results from outside Europe where some progress in relevant research has already been made, i.e. in Japan and USA, and would also benefit from a cooperation with international simulator organisations such as the International Maritime Lecturers Association's (IMLA) International Navigation Simulator Lecturers Conference (INSLC) and International Conference on Engine Room Simulators (ICERS) and the International Marine Simulator Forum (IMSF).

METNET references: Ts 8.4 and 8.5

Action: feasibility study.

8.2.2.4 Making optimum use of national MET resources

Main objectives: enhancing the cost efficiency and the quality of MET.
Already in METHAR was the scattering of national MET resources in a number of EU countries identified as one of the major obstacles for MET institutions to

- the access to expensive equipment, such as simulators, on institutional premises;
- the availability of resident expertise in all major subjects;
- the extension of activities to consultancy and research (and the making of an own income);
- becoming a valued and, eventually, equal partner in communication and cooperation with administration and industry.

There are a few countries where the national geography supports local recruitment at local MET institutions and facilitates the intake to non-degree MET. Even these countries need a MET institution where degree-MET is offered which has an appropriate size and meets above-mentioned, basic prerequisites for a centre of excellence. Such a centre will be in a position to provide higher quality of MET and may also be more cost-effective than a number of MET institutions distributed over a country.

The cost efficiency of MET institutions has not been given much public attention after a study on the costs and financing of British MET 35 years ago.

METNET has tried to identify the costs of MET but has met considerable reluctance at MET institutions to provide insight in budgets and exact figures on how much a MET student costs from the beginning to the end of studies. There are reasons for this reluctance and an interest in avoiding transparency is one of them. MET is considered as expensive compared to other technical ET on an equivalent level.

MET in almost all EU countries is financed completely or almost completely from public funds. The finance-providing national authorities would therefore be in the best position to find out how much MET really costs.

A national specification of costs and their comparison with equivalent technical ET will provide a better appreciation of MET costs.

There are indications that standards at MET institutions in the same country may vary and that MET in a number of countries may be more expensive than it need be.

To facilitate the identification of a cost-effective organisation of national MET, METNET has recommended the development of a model for a cost-effective MET institution – as stand-alone or departmental set-up – that meets the above-mentioned prerequisites for a centre of excellence. For this model the costs can then be specified by the national funding authorities and compared to the actual costs of present MET per student.

METNET reference: WP 3

Actions: development of a cost model for a national MET institution that meets principle conditions for a centre of excellence.

8.2.2.5 Intensifying efforts for furthering a safety culture in shipping

Main objectives: improving maritime safety and marine environment protection.

An enhanced competitiveness of the national maritime labour force is normally pursued in the cognitive domain whereas the affective domain is neglected.

Human failure is given as reason for most casualties, although their causes cannot always be identified in the cognitive domain since ship officers who “contribute” to the events leading to accidents are often well qualified and experienced. The initial step in the causal chain of events leading to accidents can sometimes be found in the affective domain and not even on board ships but ashore as, for example, in the head office of a shipping company or another organisation with responsibility for safety provisions on a ships.

IMO's ISM Code was a response to these deficiencies in the affective domain of the relationship between shipping company and ship. It made clear that shipping companies and ships' crews have, together with national maritime administrations, classification societies, MET institutions, trade unions and ship officer associations, a joint responsibility for safety and environment protection. A variety of other attitude-forming measures supported the implementation of the ISM Code as, for example, the introduction of quality systems according to ISO and the introduction of Quality Standards Systems according to the STCW Convention at MET institutions, which all ultimately aim at instilling an attitude in the minds of all stakeholders towards their organisations' operations that in brief could be called safety culture.

Investigations show that the requirements of the ISM Code are not always observed in full conviction. The paper work for the ISM Code is sometimes seen as a nuisance and the entire Code as a sort of necessary evil that should be followed because it is legally required. It is obvious that "compliance" with the Code comes then closer and closer to pure lip service and the effect of the Code in the affective domain becomes negligible with such a lack of commitment.

Research into the development of approaches to creating a safety culture in shipping should therefore focus on the identification of existing, mostly attitudinal hindrances to a committed adherence to the ISM Code and other quality-assuring measures and the elaboration of ways and means to overcome these hindrances and help develop a satisfactory safety culture in the maritime industry. The maritime labour force should be assisted with understanding, appreciating and becoming committed to a safety culture both on the philosophical and the practical level and, resulting from this, the industry should take a more self-regulating role.

Safety culture has to be taught and trained at MET institutions which should find out about the best way to integrate the subject into syllabi so that a sound foundation is laid on which subsequent education and training as well as maritime practice can build. Such programme should be developed and offered by MET institutes in close cooperation with ship operators and other stakeholders in the maritime industry.

Lessons learnt from accident investigations should be taken into account when developing approaches to a better safety culture.

In the context of furthering safety culture, attention should also be given to promoting security and creating a security culture. Safety and security culture should be closely connected and developed together.

METNET reference: WPs 2, 5, 6, 8 and 10

Actions: survey and review of safety training philosophies and programmes at MET institutions, development and promotion – in cooperation with stakeholders - of safety programmes in MET which foster a positive attitude to safety culture. Feasibility study on the use of lessons learnt from accident investigations for improving safety training.

8.2.2.6 Improving the exploitation of modern information and communication technologies (ICT) in MET and on shipboard

Main objectives: enhancing the quality of MET, improving the employability and professional mobility of MET graduates and increasing the number of European ship officers.

In FP 4, the Commission funded the project SEAGULL, Long Distance Learning Technologies in Maritime Education and Training. SEAGULL was just the beginning of research and development in the application of modern ICT in shipping and, in particular, for training purposes on shipboard. It would be desirable to have a SEAGULL 2 project and use the outcomes of METNET to define the subjects to which it should give attention.

Considering the limited validity duration of newly acquired knowledge and the fast rate at which new knowledge is produced, continuous updating is today a necessity. Such an updating, often referred to as life-long learning, can partly be achieved by attendance at courses offered for this purpose but also remains a task for individual efforts through self-studies. Long-distance learning programmes are well suited for the latter and allow learners to obtain new knowledge at their own pace and optimum use of time available.

It is assumed that MET students who are computer-literate and familiar with the use of ITC technologies will be more inclined to use long-distance learning in competence enhancement. Such programmes should already be made available to students at MET institutions and preferably blended with existing programmes.

For training students in a better use of ITC technologies, many lecturers at MET institutions would first have to improve their familiarity with the use of these technologies. The by METNET developed courses on the use of modern technology in teaching and the use of modern technology in assessment are a first major step in a competence-enhancing programme for maritime lecturers.

The availability of long-distance learning programmes on ships would make life on board more attractive. It would at least be equally appreciated by crews if use of modern ITC facilities and particularly access to the internet would be provided on board for facilitating contact with families and friends ashore.

METNET references: T 5.5, Ts 8.2 and 8.3

Actions: feasibility study on extended use of ICT technologies in MET and on board ships.

8.2.3 Facilitating professional mobility of ship officers within Europe

8.2.3.1 Developing textbooks for Europe-wide use at MET institutions

Main objectives: harmonizing European MET standards and facilitating professional mobility within Europe.

There is a growing trend to replace textbooks by individual notes of lecturers. This development is a consequence of the shrinking numbers of MET students that has entailed a reduced demand in numbers of textbooks and has negatively affected publishers' interest in their production.

In most cases notes by lecturers have been used to fill this void and programmes have been further "individualized" by this approach that is occasionally already hampering harmonization efforts within the same country and is making exchange between MET institutions in two countries even more difficult.

As a follow-up to the common syllabi developed by METNET and for furthering harmonization efforts and facilitating mobility, textbooks in English should be developed for Europe-wide use. These textbooks should, depending on the subject, prepared by groups of experts who participated in METNET and other experts who may be able to make substantial contributions. The Europe-wide use of these textbooks would make it interesting again for a publisher to print them. Alternatively, a working group of a few MET institutions could take care of the production.

Common textbooks would have a harmonizing and mobility-facilitating effect. The standard-setting effect of common textbooks will be an additional benefit.

In a first approach, the concept and basic features of MET textbooks for Europe-wide use should be specified and agreed by a suitable group of experts drawn from METNET participants.

METNET references: Ts 5.2, 5.3 and 5.4, Ts 6.2, 6.3, 6.4 and 6.5, Ts 7.2, 7.3 and 7.4

Action: feasibility study.

8.2.3.2 Educating and training MET lecturers and students for mobility

Main objective: facilitating mobility of MET graduates within Europe.

European mobility should be approached both top-down and bottom-up.

METNET has used the top-down approach by developing syllabi and courses on a few selected subjects in English for Europe-wide guidance and use in Essentials, Extension and Enrichment (see also 6.1 The 4E concept of MET) and has also developed English language back-up material for three Extension/Enrichment courses n order to facilitate their use. These courses should first be offered to MET graduates who were not trained in the subjects of the courses before. Such holders of certificates of competency would normally have a better command of English than MET students, would therefore be better prepared for attending such courses and would, from practical experience, also be more appreciative of the courses being offered in

English. This top-down approach is, despite its merits, in the medium-term not as effective as a bottom-up approach although it can be implemented more quickly. A bottom-up approach would also profit from Essentials being taught in English. It would facilitate the exchange of lecturers and students between MET institutions in different countries but would also put the demand on students and on a number of lecturers to acquire a good proficiency in English.

MET students and lecturers should have a good command of English and be familiar with maritime English terminology. There are shortcomings in this respect, they differ from country to country. Common textbooks in English (see also 8.2.3.1) would help to overcome them. First however, there should a compilation of appropriate maritime reading materials in English be made available for Europe-wide use at MET institutions on a dedicated website.

In general, increased importance is given to the learning of English and the teaching of English begins in most European countries today earlier than some 10 years ago. Eventually, maritime English standards will profit from this development.

An additional important step towards the recommended bottom-up approach would be the specification of the qualification that a lecturer in Maritime English should possess. The International Maritime Lecturers Association's (IMLA) International Conference on Maritime English (IMEC) should be asked through those who have developed the English language back-up materials in METNET to develop a qualification profile for lecturers in Maritime English.

Moreover, the exchange of lecturers between MET institutions in different countries should be intensified and tasks that are suitable for cooperation between MET institutions should be identified, preferably in bilateral agreements.

The sum of these efforts will help to prepare mobility of lecturers and students and, after some practical experience with mobility, will create an openness to MET in other countries and to other countries in general as well as the willingness to learn from others. Ultimately, a **"mobility culture"** in European MET will be created that is based on mutual appreciation and assistance and will help make MET graduates more inclined to mobility and see Europe, and not only their own country, as their working field.

METNET references: Ts 7.2, 7.3 and 7.4, T 9.3

Actions: project on compilation of reading materials in English on maritime subjects for Europe-wide use and establishment of a dedicated website for their presentation, survey of qualifications of lecturers who teach Maritime English at MET institutions - with a view on specifying minimum qualification requirements for them.

8.3 Towards a more comprehensive approach to maritime personnel

The European seafarer can be expected to remain “an endangered species” in the foreseeable future in spite of all efforts to attract more qualified young people to seafaring and a career in the maritime sector and in spite of other measures to increase the number of European ship officers. However, without committed national and EU efforts to increase the number of European seafarers the European seafarers may approach extinction.

The time has come to think about possible alternatives to seafarers for the occupation of positions in the maritime industry ashore where shipboard experience is essential or desirable.

While it would be extremely difficult to replace MET graduates with shipboard experience in positions where such a qualification and experience are essential by personnel without shipboard experience, the question could be asked: Under which conditions could non-seafarers meet the requirements of positions in the maritime sector where MET knowledge and shipboard experience are “only” desirable without negatively affecting the quality of the provided services?

To answer this question, it would first be necessary to identify the importance of MET knowledge and shipboard experience for positions in the maritime sector ashore where ex-seafarers are employed. The mapping of career paths (through scoping studies, see also Recommendation 7.3.1) would provide the basis for such an investigation. How important MET knowledge and shipboard experience are in the various positions should be established by an enquiry of ex-seafarers working in these positions and should be compared with an assessment of the importance of MET knowledge and shipboard experience by non-seafarers who work together with ex-seafarers.

Under which conditions could seafarers, whose qualification and experience is desirable but not essential in positions ashore, be replaced by non-seafarers, who may have to obtain additional qualifications, without negatively affecting the quality of the provided services?

Such an investigation should also cover the employment of women in the maritime sector (including their employment on ships) and find out about the suitability of MET studies without shipboard experience for work in the maritime sector.

The pursuance of alternatives to seafarers for employment in the maritime sector ashore has to run parallel with more intensified national and European efforts to increase the number of European ship officers. This double approach to national maritime personnel bases on the fact that the shore-based maritime sector has a clear preference for employing qualified people speaking the national language and also being familiar with national customs.