

# THE ROLE OF THE EDUCATION, TRAINING AND CONTINUING PROFESSIONAL DEVELOPMENT IN SUPPORTING THE AIMS OF THE WATERBORNE TECHNOLOGY PLATFORM

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## INTRODUCTION

The Waterborne Technology Platform launched in January, 2005 aims at the development of a long term strategy for meeting the needs of the European maritime industry in the next few decades. The set strategic research agenda (SRA) should ensure that the European maritime industry actors remain world leaders in maritime transport; in the design and construction of safe and efficient high value ships, including leisure craft; in marine equipment design and manufacture; in providing infrastructure and logistics for ports and waterways; and in the design and operation of offshore energy systems. The world leadership in the waterborne sector can only be achieved (and maintained) by properly trained navigators, highly skilled naval architects, marine engineers and business administrators.

This paper reviews the main pillars of the Waterborne Technology Platform and addresses the main R&D initiatives to enable European education, training and continuous professional development schemes to meet the requirements of the waterborne sector in view of VISION 2020.

## WATERBORNE TECHNOLOGY PLATFORM

The Waterborne Technology Platform is supported by the following three main pillars:

- Ship Operations offering Safe, Sustainable and Efficient Waterborne Transport;
- A competitive Maritime Industry;
- Manage and facilitate the changes in trade patterns and the growth in transport volumes.

***Ship Operation fir Safe, Sustainable and Efficient Waterborne Transport:*** The main targets in this area include: the sustain of European world leadership in waterborne transport; zero serious ship accidents in EU waters or globally by European vessels; the development of efficient vessel traffic management systems to improve the safety and efficiency of operations; the risk based design and construction of ships and offshore energy systems which can survive under the most severe environmental conditions; the development of risk based procedures for the safe operation of ships and offshore energy systems; the development of safe offshore terminals with re-gasification plants for the supply of liquefied natural gas; and the development of

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economically viable processes and systems for the reduction of air and water pollution from ship operations.

***A Competitive Maritime Industry:*** The main targets in this area include: the full integration of short sea shipping with land transportation; the further reduction of the cost of the waterborne transport compared to the cost of land based transport; the further reduction of new building delivery time and increased productivity in the equipment manufacturing; the sustain of world leadership with regard to cruise ship and other high-tech ship markets; the increase of export shares of the EU marine equipment industry; the significant reduction of the overall on board energy consumption by increasing the efficiency of marine systems; the development of new propulsion systems for non-fossil fuel and MEGA ship plants; the production of ships and offshore energy systems of lowest life cycle costs; the development of waterway transportation as an attractive, safe, efficient and high-tech mode of transport; the development of offshore platforms for the exploitation of resources in ultra-deep water (>2000 m) and in arctic areas; the development of designs and technologies for the infrastructure and components of offshore renewable energy plants; the sustain of world leadership in designing and building large cruiser ships, chemical carriers and LNG offshore terminals; the development and manufacturing of innovative cargo handling systems; and the development of environmentally friendly advanced dredging methods.

***Manage and facilitate the changes in trade patterns and the growth in transport volumes:*** The targets in this area include: Timely forecasting of world trade growth and trade patterns; the increased use of unitised cargoes; and the development of advanced logistic chain management systems and operational tools for the fast sea-land interchange.

***The Role of the Education, Training and Continuous Professional Development in supporting the three Pillars of the Waterborne Technology Platform:*** The education, training and continuous professional development of human resources at every level in the waterborne sector is of utmost importance for achieving the targets described in the above pillars of the Waterborne Technology Platform, namely to ensure the sustain of the competitiveness and the introduction of innovations in various waterborne sectors. In order to meet the above strategic targets the following objectives need to be met:

- **Sustainable access to skilled human resources:** The Education, training and continuous professional development policies must support the creation of highly skilled managers, engineers, scientists, seafarers and other human resources required for the waterborne sector. In addition an appropriate communication policy should be developed to attract skilled blue and white collar staff to the sector.
- **Quality and focus of education and training in the waterborne industry:** The evolution of the waterborne sector towards a structure with a few major construction companies and a large number of subcontractors requires new management skills based on innovation, adaptability and effective networking. Continuous professional development schemes and tools should be established throughout Europe for further or re-training of technical, management and research staff in the waterborne sector. E-learning and long distance training

geared to maritime professionals in the globalisation era should be developed to accelerate the upgrading of skills and the transfer of knowledge amongst mature and freshman, as well as non-marine staff. The expected increase in the LNG transport which has unique features will require a special training and education, thus training and education provisions for this sector of the industry should be developed. This applies also to the recreational ship market (small, large and fast crafts), expected to steadily grow until 2020. A reduction of marine accidents of recreational craft requires special training for the users, thus proper policies and procedures should be developed to create proper safety culture amongst the users.

- **Waterborne transport policy & organisational issues:** The waterborne sector should stand as an attractive sector for the employment of white and blue collar workers, engineers and researchers. An active publicity campaign should be initiated to increase the EU Citizens' awareness of the strategic and economic importance of the waterborne sector for the EU together with its vitality and sustainability.

### *Strategies for achieving the set objectives*

- Effective schemes should be developed in order to attract young men and woman and to ensure proper education and training as navigators, engineers and researchers for the European Maritime sector.
- A system should be developed and implemented for the quality assurance in education, training and continuous professional development in the waterborne sector at every level throughout the EU (accreditation of diplomas).
- The educational programmes of European universities should be modernised by adaptation of state of the art know-how in the maritime sector and be harmonised (implementation of the *Bologna Agreement* of the European Ministries of Education).
- The increased technological level and specialisation of ships and offshore structures, both at system as well as component level, requires dedicated education and training strategies, methods/tools and courses for the adaptation of customised options.
- Innovation in the European maritime sector requires the maintain and further strengthening of the European maritime R&D infrastructure (human-, soft- and hardware); this can be achieved by
  - the introduction of Research Based Education (RBE) schemes in university programmes
  - the effective networking and enhanced collaboration between universities, research institutes, marine industry stakeholders (both at large companies and SMEs level) by the introduction of new financial models and mechanisms enabling the mobilisation and optimisation of the R&D resources
- The use of ICT tools in education and the introduction of e- and long distance learning schemes should be enhanced and effectively implemented at the various levels of the maritime profession.

The implementation of the above strategies will require increased funding from relevant EU programmes, particularly from the *Marie Curie* framework programme.

## **THE CAREMAR PROJECT**

The recently launched CAREMAR (Coordinated Academic Research and Education to Support Innovation in European Marine Industries) project, which is coordinated by the WEGEMT Association of European Universities in Marine Technology and Related Sciences and is funded by the EU-FP6, aims at preparing a framework for coordination of the academic research and education for the support of innovation in the waterborne sector. As such it is an instrument of strategic importance for the Waterborne Technology Platform to achieve its overall aim.

The CAREMAR project aims at the identification and development of mechanisms to link the expertise within European universities with the research, education and technological requirements from industry stakeholders working in the waterborne sector. The project addresses the delivery of innovative scientific research and Research Based Education (RBE) in the context of a changing global market where European growth and competitiveness depends upon industry's ability to be flexible and efficient and to develop innovative marine products. The CAREMAR project seeks to make an effective contribution to sustainable marine surface transport and marine tasks for the benefit of European society.

The EU is investing heavily in research, training, continues professional development, and European maritime clustering to respond to the fierce competition by the maritime industries in the Far East. European universities are in many engineering disciplines internationally accepted as leaders in education and research, as documented through a variety of activities (attractiveness to students from all over the world, participation in large scale research programmes, strong participation within international research and regulatory bodies, efficient dissemination of results) and several university departments/research units form themselves into Centres of Excellence in various disciplines, including marine technology. According to a recent WEGEMT survey among its associates, the number of researchers (professors, senior and young researchers) within European academic institutions involved with marine technology by far exceeds 3000. They address all fields of interest to the marine and shipping industries, and thus, with the right investment, communication and strategic focus, could be harnessed effectively to support industry needs. This resource therefore, far exceeding the resources of marine industry and research associations, has tremendous latent potential, and will form the basis for the future supply of knowledge and expertise in industry and research associations. However, resources within European universities remain largely untapped, and it is an increasingly held belief that to support good quality EU-level development work conducted under the instruction of industry, the means to support a more collaborative approach between Universities and industry must be found. The advantage of improvements in methods to encourage scientific and technological collaborative research and knowledge exchange will sustain future Maritime industry activities. An under-investment in university systems and infrastructures in Europe thus far is a major factor contributing to many of the fragmentation issues that need to be addressed.

CAREMAR will be a platform for the coordination of European university expertise and the delivery of this expertise in a way that responds to European maritime industry vision in both the short term and the medium to long term. No attempt has been made thus far to mobilise the greater part of this university expertise in one

coordinated programme, thus CAREMAR follows the demand by the European industry to seek solutions for sustainable transport and competitive businesses through mobilising the skills and resources of the entire European marine technology academic community in areas prioritised by the European maritime industries themselves.

The CAREMAR project (2005-2008) will be carried out by a number of WEGEMT members and CESA. WEGEMT is a not-for-profit European Association of 39 Universities in 17 countries. It was formed in 1978 with the aim of increasing the knowledge base, and updating and extending the skills and competence of practicing engineers and postgraduate students working at an advanced level in marine technology and related sciences. At present, WEGEMT activities include supporting, encouraging and participating in programmes of Research and Development (R&D), Education, Training and Continuing Professional Development, and Information Exchange and Dissemination where it relates to the waterborne sector. The WEGEMT Associates are drawn from universities from all over Europe, the former Eastern Europe and the CIS. They have in common, a capability, expertise and experience to teach and carry out research in marine technology and related sciences and an active interest in collectively delivering initiatives that support marine industries.

## **CONCLUDING REMARKS**

It is believed that education, training and continuous professional development will play a significant role in achieving the targets of the waterborne sector set out for 2020. A series of strategic R&D activities pertaining to education and training are proposed for achieving the set objectives. The new EU funded CAREMAR project is believed to greatly contribute towards the identification and development of mechanisms to link the expertise within European universities with the research, education and technological requirements from industry stakeholders working in the waterborne sector and thereby to support the waterborne sector to achieve its VISION 2020 targets.

## **REFERENCES**

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CAREMAR

