



European Boat Design Innovation Group for Wind Farm Support Vessel (EBDIG –WFSV)

The first EU funded EBDIG project was very successful. It established an on-line platform and a course for yacht designers of the future. More information is available in www.ebdig.eu. This project is the second EBDIG project aim at training the designer of future wind farm vessels.

There are several reasons as to why the second EBDIG project is needed. Recent research has indicated that current wind farm support vessels (WFSV) will not be appropriate for accessing far shore wind farms. In order to improve operability of WFSV accessing the far shore wind farms, some with over 1800 turbines located in up to 120 Nautical Miles from the shoreline, a new breed of support and mother-ship vessels are needed.

A review of the Extrapolating the European Wind Energy Association's (EWEA) growth scenario for the period up till 2030 clearly indicates that there will be a huge employment opportunities for some 851,4000 in the installation, operation and maintenance, of offshore wind farms and that there will be a need for novel specialist marine vessels.

In the new designs, the interior design principles applied to vessel accommodation is expected to help reduce the adverse effects of shift work, through creating a low stress appealing living environment. Human Factor Integration (well established in the defence sector) in the design of the bridge should be taken into consideration with a view to reduce cognitive workload and hence reduce the risk of human error, the most significant cause of marine accidents.

Aims and objectives

The main aim of the project is to provide innovative professional development training and networking to commercial marine industry employees by transferring embedded practices within interior design and the leisure marine industry which will enable the European commercial marine sectors to understand and exploit growing design opportunities in the wind farm support vessel sector to produce more appealing working conditions for this new and growing sector to help recruit new staff and reduce the risk of human error. Within this aim is embedded two key objectives; i) to use the e-learning platform of the previous EBDIG project (www.ebdig.eu – and also its video conferencing, moodle, etc.) and, ii) to transfer innovation from the interior design and leisure marine industry in Wind Farm Support Vessel (WFSV Design; WFSV mother-ship design; Human Factors Integration (HFI) via 3 courses and a networking framework.



Consortium

The consortium is led by Coventry University support by several European partners including of Piri Reis University. The project will benefit from an Advisory Group (AG) made up of; RINA, BMF Commercial and Lloyds Register. They will be joined by industry & research institutions in each country. Delivery partners, educational institutions and small and multinational companies represent the UK, Italy, Netherlands and Turkey. They will contribute existing projects in marine design, ergonomics, and e-learning to develop the EBDIG materials/infrastructure.

Expected outcomes

The expected outcomes of the project are:

- 1) Industry survey (to be carried out by NL, TU, IT, UK).
- 2) 3 Courses developed in Wind Farm Support Vessel: i) WFSV Design; ii) WFSV mother-ship design and iii) Human Factors Integration (HFI) – All partners.
- 3) Industry pilot (in each partner country).
- 4) Dissemination of a recommended methodology for the commercial boat industry design cycle (all partners).

Impact

The main impact is the greater understanding and awareness of the needs of the wind farm vessel industry in partner countries particularly in Netherlands and the UK, and the market potential for ship builders in Italy and Turkey. The second impact will emerge from a better trained commercial marine industry staff members who are more aware of emerging technologies and techniques. The last, but by no means least impact is the opportunity to lead the boat industry to standardised qualifications in Wind Farm Support Vessel (WFSV Design; WFSV mother-ship design; Human Factors Integration (HFI).

Why do this Project

To take a lead in wind farm support and mother-ship vessel design and help to create job opportunities for young and more mature designers in a new and emerging wind farm sector. The EC action document 2008 on offshore energy opportunities identifies growth 'bottlenecks' as 'limited availability of skilled personnel in related sectors'.



Future Wind Farm Supply Vessels (Above) to supply future far-shore wind farms (Below)





A substantial number of these wind farms will be located in the North Sea up to 100km offshore and servicing Scandinavia, the low-countries and the UK. It is expected that Italy and Turkey will take a greater role in development and installation of wind farms. Physical environment stressors and long work hours inherent in this harsh environment adversely effect fatigue and performance.

Design consideration of the environmental conditions in the workplace may serve to reduce these adverse effects. The perceived comfort of crew on a commercial vessel is a combination of the visual impact of the exterior/interior design of the vessel. Design must therefore meet crew needs, in terms of functional and emotional requirements, as informed by human factors. The opportunity to transfer innovations from the leisure marine industry to the commercial vessel industry will result in optimised design methodologies, resulting in improved efficiency, crew health and safety outcomes due to reduced fatigue.

This project will feed into the policy initiative, "Marine Knowledge 2020". The new European maritime transport policy until 2018 advocates creating new ship designs, as a key priority to enhance market share and the policy green paper, states the sector must find the way to benefit from innovation. "It is only in this way that we will be able to contribute to the innovation union agenda of economic growth and job creation". EBDIG-WFSV directly corresponds with EU marine policy by training the industry in the use and application of advanced Human Factors; exterior styling; interior design. This will enable them to better understand and exploit these innovative design approaches to enhance the experience of crew on commercial vessels. The benefit to the offshore industry is improved health and safety, outcomes which are due to reduced fatigue and superior performance and greater workforce skills.

In terms of the European commercial marine industry this project directly addresses the need to enhance competitiveness through the innovative application of leisure marine (super-yacht and motor-yacht) styling, interior design and advanced ergonomics, to create new ship designs.

Project specific deliverables

The project is expected to up-skill 40+ commercial marine industry professionals with interior design and leisure marine design techniques so that they may better understand and exploit the opportunities presented by WFSV design, WFSV mother-ship design, Human Factors Integration and ICT to assist, excite and capture the imagination of consumers and respond to crew needs in the ever more demanding and growing customer base of the wind farm sector. The proposed training is expected to improve safety, performance and efficiency of crew.

Objectives; to use online courses and an interactive e-learning environment to transfer existing innovation from interior design and the leisure marine design (super-yacht and motor-yacht) industry and education in by WFSV design, WFSV mother-ship design, Human Factors Integration and technology application within the work environment so that the European commercial marine work-force develop world class skills and competencies to ensure the continued growth and competitiveness of the wind farm support vessel sector of the European Commercial Marine industry.



The project is novel and will also developed a design methodology for adoption within the commercial marine industry promoting the use of innovative content and delivery such as, CAD based animations, interactive 3D CAD images, etc. The training programme will be accredited by a chartered professional body as was the case with the first EBDIG.

Role of TUDEV/Piri Reis University

TUDEV, the Foundation, and the Piri Reis University will play a central role in supporting several WPs, primarily assisting in transferring training materials to ensure relevance to the marine industry training needs. The University will also take part in the proposed harmonization and dissemination activities. This involves evaluating the quality and standards of current practices and to recommend necessary changes to the practice in Turkey. PRU are an experienced innovator and currently have the largest number of EU funded projects related to Maritime Education and Training. PRU will take a lead on the use of ECVETS to accredit the training material within the partnership countries and is expected to seek professional endorsement of the intended courses from a major chartered professional body.