MariFuture

Development Paper – February 2011 Issue

Looking into the Future - New Initiatives by the European Commission

Extracted from recent correspondence between Professor Ziarati and HE Commissioner Damanaki

Dr Martin Ziarati

MarEdu Partnership – info@maredu.co.uk or martin.Ziarati@c4ff.co.uk

This Paper is in two parts; Part 1 concerns the recent discussions between Professor Ziarati and the Commissioner, Maria Damanaki and Part 2 contains the call details for the Waterborne Topics in FP7 Transport Workprogramme 2012. Professor Ziarati is keen for MariFuture project teams to take full advantage of the opportunities within the FP7 and to prepare themselves for EU new initiatives as outlined by the Commissioner, Maria Damanaki.

Part 1

In recent weeks Professor Ziarati has been discussing the future of MariFuture with colleagues at the European commission (EC). The EC is of the view that MariFuture activities are interesting and relevant to the activities developed under Integrated Maritime Policy (IMP). It is also known that Professor Ziarati has always been very concerned about opportunities for small and medium size enterprises (SMEs) whether regarding their participation in various national and European Union (EU) education and research programmes or aspects relating to various policies and programmes imitated by the EC. The commissioner, Maria Damanaki, has drawn Professor Ziarati's attention to several initiatives that the Commission intends to develop which may be added to the future map of MariFuture. A summary of the future map of MariFuture is given in the November 2010 Development Paper. The letter to Professor Ziarati from the Commissioner clearly points out that SMEs have a strong potential for innovation in Europe. In this respect, the Commissioner suggested that MariFuture partners might be interested in the initiative "Marine Knowledge 2020" recently endorsed by the European Commission. This initiative supports further involvement of SMEs in innovation actions as it aims to improve knowledge infrastructure and overcome barriers to discovery, access and use of data, it will therefore unlock and assemble marine data from different sources and facilitate their use for purposes other than those for which they were originally intended.

The Commissioner also informed Professor Ziarati of a new initiative "Towards an Integrated Maritime Policy for better governance in the Mediterranean'', which the European Commission has set as one of its key challenges viz., the facilitation of knowledge-based actions for the development of sustainable maritime economies and effective coastal management. She has stressed that, the success requires policies built on foundations of best available scientific knowledge.

In view of the letter from the Commissioner, regarding "Marine Knowledge 2020" and "Towards an Integrated Maritime Policy for better Governance in the Mediterranean" initiatives, Professor Ziarati is of the view that the MariFuture Future Map, as presented in the November 2011 Development

Paper, needs to be reviewed so that partners in the MariFuture can take advantage of the European Commission actions and initiatives. These initiatives will be aiming to improve efficiency and quality by stimulating integrated research efforts particularly in Mediterranean and their intended actions which are designed at strengthening international and European scientific co-operations.

The Commissioner also informed Professor Ziarati that the Consortia of European bodies are already setting up a prototype European Marine Observation and Data Network (EMODnet) to facilitate access to data in a limited number of sea basins for those public and private bodies that need them. Users can download not only the data, but also information as to the reliability of the measurements.

Part 2

Waterborne Topics in FP7 Transport Workprogramme 2012

SST.2012.1.1-2. Assessment and mitigation of noise impacts of the maritime transport on the marine environment (Coordinated call within the framework of the Ocean of Tomorrow)

Directive 2008/56/EC of 17th June 2008 (Marine Strategy Framework Directive) establishes a framework within which Member States shall take the necessary measures to achieve or maintain good environmental status in the marine environment by 2020 at the latest. Marine strategies shall apply an ecosystem-based approach to the management of human activities.

In order to determine the environmental status a series of qualitative descriptors have been set in the Directive. In its Decision of 1st September 2010, the Commission has provided details regarding each of those descriptors.

Descriptor 11 addresses underwater noise, underlining the potential adverse impacts on the marine environment. Amongst the anthropogenic activities affecting organisms, shipping is pointed at with long lasting sounds.

The International Maritime Organization (IMO) has started a reflexion on the noise generated by commercial shipping at its session 60 of IMO-MEPC. Cavitation has been identified as having a prominent role for the generation of noise

Therefore research should focus on an accurate description of cavitation noise and on mitigation measures to reduce the noise with the constraint to maintain the fuel efficiency of ships at its highest level. Research should also provide accurate modelling tools to assess the noise footprint of ships.

Activities will include:

- Development of radiated sound prediction tools, for the estimate of propeller noise (including the effects of propeller-wake and propeller-hull interactions), with particular emphasis on the accurate description of cavitation noise.
- Development of measurement tools/techniques for selective detection of cavitation effects on noise signature.
- Development of tools for the prediction of the "noise footprint" of commercial ships (including cruise ships), linking underwater noise characteristics to AIS data (Automatic Identification System) and for the determination of noise spatial distribution linked to shipping. Noise spatial distribution should be linked to the ocean atlas developed by DG MARE.

- Development of mitigation measures to reduce the noise footprint of ships without reducing the fuel efficiency of the ships.

Research should take into account the relevant noise characteristics for the protection of the marine environment.

Funding scheme: Collaborative Projects - small or medium-scale focused research projects

Group of topics N° 2

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria. You must refer to the call fiche for details of these limits

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2012-###-1

SST.2012.2.2-1. Green vessels for efficient logistics chain

On 2 December 2010, the Transport Ministers of the European Union called upon a full integration of waterborne transport into the EU transport and logistics chains. The Council stressed that, within a sustainable European transport system, inland waterway transport is a key contributor to seamless hinterland connections. The Council also underlined that the modernization of the fleet and infrastructure are important elements for the development of inland waterway transport.

The Strategic Research Agenda for Inland Waterways Transport from September 2010 supported by the EU through the FP7 project PLATINA points at the over-aging at large parts of the inland fleet and sets as strategic goal the modernization of inland fleet through retrofitting or new building of inland vessels. As the 2011 work programme addressed the retrofitting of the inland fleet, the current work programme puts emphasis on new building.

Focus should be put on new eco-friendly ship concepts, including tug-barge systems allowing for efficient cargo handling and on infrastructure. A key issue is to efficiently link the motorways of the sea with coastal and inland routes.

Activities will include:

- The development and validation of novel ship types, including tug-barge systems with low fuel consumption, low emissions, new transhipment and stowage technologies, durable and easy-to maintain hull structures, excellent manoeuvring capabilities also in shallow and low level waters.
- Development of novel cargo ship and/or ferry concepts based on modularization and standardization of components for the cost-effective design of ship variants. Development of optimization tools for ship cargo variants to address different geographic areas (e.g. Rhine, Danube, etc.).
- Development of new integrated, safe and reliable energy systems for propulsion and auxiliary services. Alternative energy sources and fuels will be considered to obtain low fuel usage and low emissions.
- Investigation of the possibilities for modernization of waterways with respect to the hydrodynamics of the shipping and to the existing infrastructure, including the exploitation of intelligent transport services.

Funding scheme: Collaborative Projects - small or medium-scale focused research projects
Group of topics N° 2

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria. You must refer to the call fiche for details of these limits

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2012-###-1

SST.2012.2.2-2. Towards an implementation of the NAIADES Action Areas

Content and scope:

A coordination action shall be established, consolidating the IWT network and partnership as established with the support of the FP7 project PLATINA and to ensure a solid knowledge basis for the implementation of the NAIADES programme. The coordination action shall build on the results of PLATINA and shall reflect the multi-disciplinary requirements and complexity of the subject. The coordination action shall be organized around the five NAIADES action areas, but shall also take into account the results of the NAIADES progress report and other related activities.

The coordination action shall in close cooperation with the European Commission set up a roadmap for the implementation of actions not yet started or to be finalized and ensure the support to permanent–type of actions. It shall identify the appropriate measures and define the necessary means and tools.

It shall ensure an active participation of key industrial stakeholders, Member States administrations, industry associations and river commissions. It shall take the lead in coordinating and supporting activities relevant to the promotion and development of the inland waterway sector. It shall help to increase awareness regarding the possibilities the sector offers. It shall identify best practices and serve as an exchange, discussion and promotion platform.

It shall further strengthen the coordination between national, EU and industrial research, assist in assessing research and related implementation activities and assist in technology assessment, forecast and transfer.

This CSA should not exceed EUR 2 million.

Funding scheme: Coordination and Support Actions aiming at coordinating research activities

Group of topics N° 2

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2012-###-1

SST.2012.4.1-1. Human element factors in shipping safety

The crucial influence of the human element on safety, security and environmental protection has been recognized by the International maritime Organization (IMO), including in its "Vision, principles and goals" for the human element, as set out in resolution A.947(23) [IMO, 2004].

The combined and integrated effects of human error and intervention have shown to be a major consideration in the estimation of the probability of structural failure. Better understanding of these factors, coupled with appropriate data from similar structures and design and construction practices, should allow better predictions of failure probability to be made and therefore allow for improved design optimization.

The ship needs to be analysed as a system composed of her hull, her equipment as well as her crew and management organisation. Any of her components is likely to directly or indirectly cause or aggravate a failure and threaten the whole ship's integrity. Therefore future approaches will inevitably integrate the Human Element in the design of the ship hardware, software and all procedures and safety management tools. Research activities should be fully compatible with priorities identified under the IMO's e-navigation and EU's e-maritime initiatives.

Activities will include:

- Multi-disciplinary, human centred design optimization, including:
  - Framework for integrating human factors in ship design projects
  - Tools and methodologies for integrating human factors in ship design projects and optimization
- Goal setting approaches for future application of complex human centred systems, including:
  - Development of error-free Human-Machine-Interfaces, e.g. in the context of the development of e-navigation.
  - Development of principles for ensuring system's resilience through people.
- Operation, maintenance and intelligent evacuation concepts, including:
  - Research in the effects on harsh environmental conditions on seafarer's performance.
  - Novel concepts for integrating human performance and physical capabilities in risk-based inspection approaches.
  - Tools based on behavioural sciences for evacuation optimization.

The consortium shall take appropriate measures to ensure that methodologies and technologies developed in other transport or industrial sectors are taken into account. Cooperation with other sectors should be envisaged.

Funding scheme: Collaborative Projects - small or medium-scale focused research projects

Group of topics N° 2

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria. You must refer to the call fiche for details of these limits

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2012-###-1

SST.2012.4.1-2. Safety of ships in extreme conditions

In its Communication of 2008 - The European Union and the Arctic Region - the Commission underlined that in spite of harsh conditions, melting of ice and new technologies will gradually increase access to new navigation routes. Amongst the actions related to transport, it was recommended to support any further work to enhance IMO safety standards applicable to Arctic waters.

This priority was reemphasized by the Commission in 2009 in the Strategic Goals and Recommendations for the EU's maritime transport policy until 2018, i.e. that special attention should be devoted to challenges posed by extreme navigation conditions, such as ice, as well as the constantly increasing size of vessels.

As underlined by the Arctic Council in its 2009 Assessment Report on Arctic Marine Shipping, harsh conditions and lack of infrastructure in much of the Arctic create a higher vulnerability to

emergencies than in more temperate climates. Consequently, prevention, preparedness and response must be adapted to Arctic conditions.

In 2008, IMO has adopted "Arctic Guidelines" for passenger ships. These non-mandatory guidelines that contain contingency plans for emergencies are actually under revision. Other international instruments also govern navigation and safety aspects of arctic navigation, e.g. SOLAS, STCW, etc.

Activities will include:

- An identification of gaps regarding safety measures (construction, equipment, operation) in the voluntary Guidelines for Ships operating in Arctic Ice that is currently under revision.
- Comparative analysis of the various ice-strengthening class capabilities and strengths, in view of standards coordination.
- Development of best practices for rescue operations in the remote and cold Arctic regions, in particular for cruise ships.
- Development of uniform training standards for ice navigation, in view of the development of training standards.
- Analysis of the salvage capacities and future needs.

The consortia should include participants from the Arctic States concerned, including Canada, USA and Russia. It should also include Class Societies.

Funding scheme: Coordination and Support Actions aiming at coordinating research activities

Group of topics N° 2

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2012-###-1

SST.2012.5.2-3. Innovative structural and outfitting materials for ships including inland ships

Competitiveness of the shipbuilding industry and reduction of shipping environmental footprint are at the centre of preoccupations of the waterborne industry.

New materials, in particular lightweight materials, can provide suitable solutions to reduce ship environmental footprint, including during the manufacturing, maintenance and dismantling phases.

However, the use of new lightweight materials on a large scale could be hampered either by difficulties during manufacturing and assembling processes, by the costs to manufacture or processes the new materials or by classification issues.

Research in new materials could focus on any lightweight material suitable for shipbuilding, e.g. alloys, composites, etc. Attention should be paid not only on the possibilities of a specific material to reduce the footprint of shipping but also on the environmental footprint of the material itself, including the recycling phase.

In addition, new innovative steel material for the maritime industries and new coating materials could also greatly improve properties for corrosion resistance, friction, weldability and dimensional accuracy during construction.

Competitiveness of the waterborne industry, including construction and operation, will be the guiding principle of the research. All material researched should be susceptible of class approval.

Research should focus either on the entire structure or substructure of the ship or on parts of the structure. All vessel types, including inland vessels, can be considered.

Activities will include:

- Development of new cost-effective lightweight materials.
- Development of new steel material.
- Development of new coating materials, including nanotechnology for marine applications, to reduce costs in new building, maintenance and repair.
- Development of combination techniques for of dissimilar materials in ship structures or super-structures, taking into account recycling and disposal.
- Development of innovative processes that maximize materials capabilities while minimizing costs.
- Assessment of the long-term degradation of new materials and joints under various loading conditions.

Consortia must include at least one Classification Society.

Funding scheme: Collaborative Projects - small or medium-scale focused research projects

Group of topics N° 2

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria. You must refer to the call fiche for details of these limits

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2012-###-1

SST.2012.5.2-5. E-guided vessels: the 'autonomous' ship

The objective of the research it to increase the adaptability, availability and autonomy of the waterborne transportation through enhanced autonomy for ship systems and ship, i.e. the capability to solve problems with limited human interface.

Ship-shore data transfer has already found useful applications in shore-based remote services such as weather routing, which increases the adaptability of ships to the environment but also increases ship availability by limiting time losses due to bad weather. Ship availability can also be increased by remote monitoring and diagnostics which allow applying predictive maintenance concepts. Other remote services are providing guidance to ships to arrive just in time at the terminal following an optimal path given the predicted weather and swell conditions and other constraints. Ongoing developments in ship automation and in communication technology are gradually leading to more autonomously operating ship systems.

Recent developments in information and communication technologies (ITC) make safe wireless transfer of large amounts of data from ship to shore possible. This capability could be used to develop a whole new range of innovative and life cycle-oriented concepts that will increase the adaptability, availability and 'autonomy' of waterborne transportation allowing a fresh approach to improving of ship operations and waterborne transport quality.

New solution to increase ship autonomy should consider the legal implementation of such solution, in particular the liability aspects.

Activities will include:

- The improvement of safe wireless ship-shore data communication links, including integration through e-maritime applications.
- The development of concepts, methods and means for autonomous ship operations (e.g. when approaching ports, manoeuvring and berthing and remote pilotage).
- The design of new ship functions systems for increased autonomy, in particular regarding those system and functions necessary for monitoring, data collection and data transfer. Safety and legal issues shall be considered.
- The development and validation of cost-effective concepts for predictive maintenance approaches.
- The assessment of the proposed products and services, in legal terms (liability), safety and economic terms.

Funding scheme: Collaborative Projects - small or medium-scale focused research projects

Group of topics N° 2

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria. You must refer to the call fiche for details of these limits

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2012-###-1

SST.2012.5.2-6. E-Maritime

The EU e-Maritime initiative is aimed at making maritime transport safer, more secure, more environmentally friendly and more competitive by improving knowledge, facilitating networking and dealing with externalities. To support compliance to and enforcement of regulations and policy implementation is a heavy task for the shipping industry. Administrative procedures are complex and time-consuming and are still today often done through paper transactions. Differing interpretations of regulations and standards create additional inefficiencies. A specific focus of the proposed support action is the facilitation of compliance with EU directives and international regulations concerned with maritime transport performance, safety and security.

Activities will include:

- Development of standardized (or harmonized) e-Services for more effective and coordinated enforcement controls and inspections.
- Optimization of the use of e-services in support of the class requirements, particularly on surveys and for supporting ship risk management in upgraded e-Maritime shipping applications.
- Modelling and potential delivery of regulations in electronic format to support automated compliance management both for port state control and IMO regulations.

Expected results:

- Development of solutions that can be carried out and processed electronically in an harmonised way for operations in Europe.

- Define and test tools for designing and implementing regulations in a rational manner and easily supported by information systems.
- Methodological approaches to inform the possible users and support their implementation by the relevant authorities and organisations.

Funding scheme: Coordination and Support Actions aiming at coordinating research activities

Group of topics N° 2

Note: Limits on the EU financial contribution apply. These are implemented strictly as formal eligibility criteria. You must refer to the call fiche for details of these limits

Open in call: FP7-SUSTAINABLE SURFACE TRANSPORT (SST)-2012-###-1

Martin Ziarati

MarEdu Partnership