EMECrid

The R&D group of EMEC

Newsletter

Issue 2/2007

Editorial

Patrick PERSON

Now, it is time to leave for me, after more than 15 years of active contribution to European research and development in shipbuilding and maritime transport. When, coming from a function of general manager of a shipyard in the late eighties, I was asked by my chairman to manage activities on R&D, I felt not prepared to such a big change. In fact it was more than exciting to meet and to work with many nice and clever people coming from the different sectors of the maritime industry: shipyards, my colleagues, equipment manufacturers, my suppliers, research centers which I discovered, and last but not least, ship-owners, my discuss. And I was adopted at once – the prove of my links to this new domain from CHANTIERS de l'ATLANTIQUE, in 2001, I decided to pursue my activities in European R&D.

So, after nearly 10 years of chairmanship of COREDES, the R&D group of the European Shipyards, 3 years of chairmanship of EMECRID, the R&D group of the European Equipment Manufacturers which I created in 2004, I have decided, my age being the reason, to leave these activities, which are for the time being in a good situation: when I started in 1989, the funding obtained yearly from the European Union was less than 2M€ for the maritime industry, today the amount is more than 60M€: the work achieved by all of us has been quite successful.

And this success is also mainly due to the cooperation of the European Commission who has always listened to us and has understood the strategic impact of the maritime industry for Europe. With the political support of Commissioner BANGEMANN, we have had excellent cooperation with Ernesto CAMPOGRANDE, Frédéric SGARBI, Jack METTHEY and more recently with Luisa PRISTA, and Joost de BOCK.

Before leaving, I wish to give a message which I consider as important. I have noticed during these 15 years of R & D coordination a growing absence of motivation of the chairmen and directors general of the companies for R & D policy ; in my opinion, there are apart the efficiency, three keys to survive for the European industry: training of personnel investment, and RESEARCH and DEVELOPMENT studies correctly protected by IPR. My feeling is that today our managers are too much focused on the day to day situation and not enough actively present in the decisions dealing with the research and development policy of their companies.

Our maritime industry has got a wonderful tool, an excellent network of active R & D partners: the WATERBORNE TECHNOLOGY PLATFORM for which I am proud to have fought during some years. I am therefore happy to quit these activities in such conditions.

Norman GRUM
Secretary to the EMECrid Technical Working Groups

WATERBORNE
Route Map Overview

1 Introduction
EMECRID has been working hard within the Waterborne Technology Platform to represent the Marine Equipment Industry and achieve recognition of its contribution and research priorities. We have taken a leading role in the development of the Waterborne Vision and Strategic Research Agenda (WRSA) and developed a blueprint for the WSRA Implementation Process with our own EMECRID Implementation Plan. This contribution has enabled EMECRID to take a lead in the development of the Waterborne Implementation Route Map.

The Implementation Route Map will seek to coordinate the efforts of the Waterborne stakeholders behind a strategy for competitive excellence dedicated to meeting the market and society's most essential needs. The Route Map has been developed as a first step in this major undertaking to provide an overview of the WSRA Implementation process. The Implementation Route Map presents an opportunity for EMEC members to visualize the RD&I programmes across the whole Waterborne sector and identify opportunities to influence and participate in major initiatives.

2 Towards Vision 2020
The Waterborne Vision 2020 targets are presented under the WATERBORNE pillars of Sustainability, Competitiveness and Growth:

1. *Safe, Sustainable and Efficient Waterborne Transport*
2. *A competitive European Waterborne Industry*
3. *Managing and facilitating the growth in transport volumes and the changes in trade patterns*

This Vision categorises qualitative measures of the Waterborne sectors' success by the year 2020, with the ambitious targets to be met and the related innovation challenges. These targets are not rigid and are subject to the feasibility of technological and economic development; they therefore represent the drivers and challenges for innovation towards 2020, not absolutes or deadlines. The Waterborne Strategic Research Agenda Overview presented a list of research priorities that were agreed by all of the Waterborne stakeholders. The stakeholders then proposed the research topics to address the WSRA priorities and industry research needs.

- *Waterborne Pillar*
- *Strategic Research Agenda Priority*
- *Research Topics*

The research Topics were developed by a consolidation of a 'bottom up' development from the VISION targets and WSRA priorities, and a 'top down' assessment of product, service and infrastructure needs by industry. The research topics can therefore integrate multiple research

Bob van de Graaf of CESA and Norman Grum of EMECRID, co-editors of the Waterborne Implementation Route Map

priorities. The Route Map will show how the individual research topics can be logically integrated to contribute most effectively to the Vision targets. The route map is a tool to promote communication and collaboration across the Waterborne sector. It can enable the diverse stakeholders in Waterborne to identify synergies in research and funding opportunities, leading to ambitious large scale programmes. It is not a rigid plan to which everyone must conform, but an enabler in the development of an Implementation Plan integrated across the whole Waterborne sector.

Waterborne organised 3 workshops in early 2007 to help prepare a Route Map structure for an Implementation Plan by:

- *Identifying potential exploitation outcomes that contribute to a vision goal*

- *Identifying milestones objectives*

EMECRID and CESA organised the workshop on the pillar 2 priority of Competitiveness which was well supported by EMEC members.

The suggested Exploitation Outcomes derived from all 3 workshops are shown in table 1 below. The Exploitation Outcomes represent the products, services or capability that will be delivered by the European Waterborne industry to clearly demonstrate achievement of the Vision 2020 targets. Milestones will clearly identify the major achievements that the research programmes will deliver in 5 to 15 year timescales, and combine to create substantial new world leading products and capability. The milestones are the major research and demonstration objectives necessary to achieve the exploitation outcomes. Milestones will be significant deliverables resulting from a number of co-ordinated research topics.

1	Low Risk Ship
2	Low Energy, Low Emissions Ship
3	Autonomous Ship
4	The Sustainable Recreational Craft
5	The Dedicated Short Sea Ship
6	The European Cruise Ship
7	Seven Day Ship Design
8	Leading Shipbuilding
9	Energy Transport in Extreme Conditions
10	Intelligent Integrated Transport Network
11	Intermodal Waterways
12	Sustainable Accelerated Port Development

Table 1

3 Implementation Plan Route Map

The Route Map process begins with the agreed and published Strategic Research Agenda topics and progresses to compliance with one or more Vision Targets by means of Research Programmes, via Development Milestones and Exploitation Outcomes.

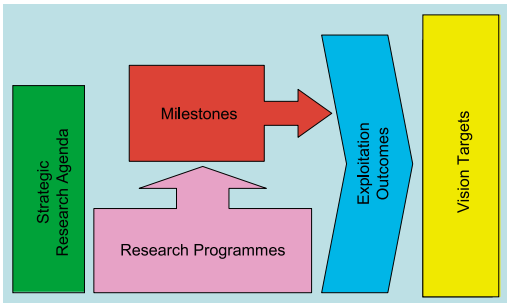


Figure 1 Route Map Process Schematic

The Route Map structure is shown in detail in Figure 2 below, its key value that it can show the many links between different research topics and the possibility that these be grouped together to create major research programmes. It can be used as a tool to bring together different parts of the industry with common goals, in a more integrated research strategy. Existing research programmes are shown on the Route Map for information. Some Research topics can feed into more than one Exploitation Outcome. This inevitably appears complex but must be seen in the context of the real world maritime research and product development up to 2020, involving all of the Waterborne stakeholders. The Route Map will evolve with time as new opportunities appear and knowledge is gained from ongoing programmes, together with developing market and society needs.

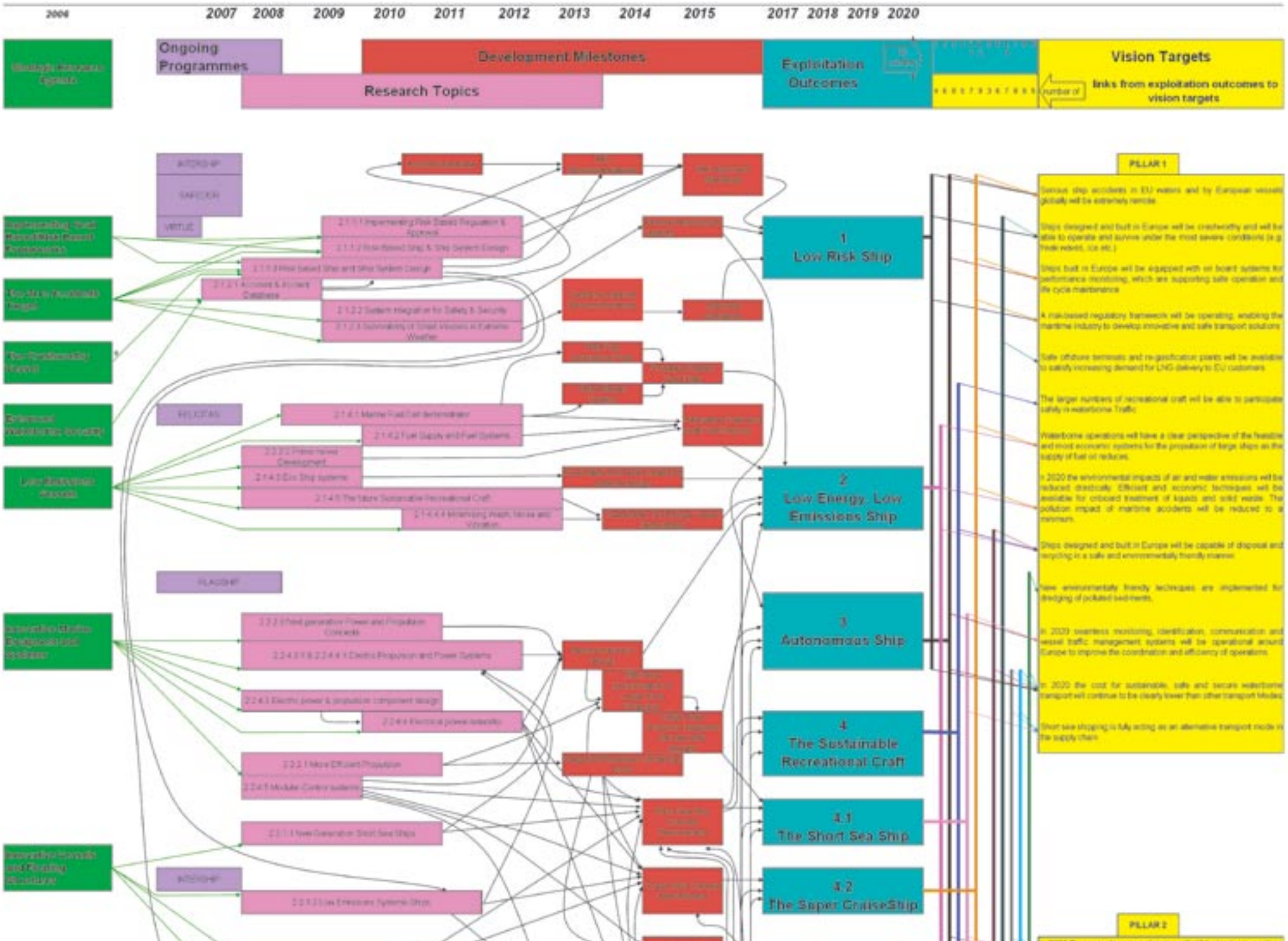
4. Looking Forward

Major Project Opportunities have already been created through the EMECRID engagement in the Waterborne Implementation Process

- FP7 first call
  - *More Electric Propulsion*
  - *Eco Ship*
- FP7 second call
  - *More Efficient Propulsion*
- Implementation Route Map
  - *Exploitation Outcome Programmes*

We must now consolidate the inputs to the first publication of the Implementation Route Map (WIRM) in December this year, by reviewing and updating the EMECRID specific research proposals.

The first issue of the WIRM must be followed up with actions to increase EMEC members engagement in the Waterborne Implementation Process. We need to canvass views on research priorities and potential collaboration partnerships. A platform for these views has been created through the major contributions of EMECRID to the Waterborne platform over the past 2 years. The challenge for the future is to create the new ideas that will live up to the aspirations in the Vision 2020 targets.


2004
2007
2008
2009
2010
2011
2012
2013
2014
2015
2017
2018
2019
2020
Ongoing Programmes
Development Milestones
Research Topics
Exploitation Outcomes
Vision Targets
links from exploitation outcomes to vision targets
1 Low Risk Ship
2 Low Energy, Low Emissions Ship
3 Autonomous Ship
4 The Sustainable Recreational Craft
4.1 The Short Sea Ship
4.2 The Saper CruiseShip
PILLAR 1
PILLAR 2

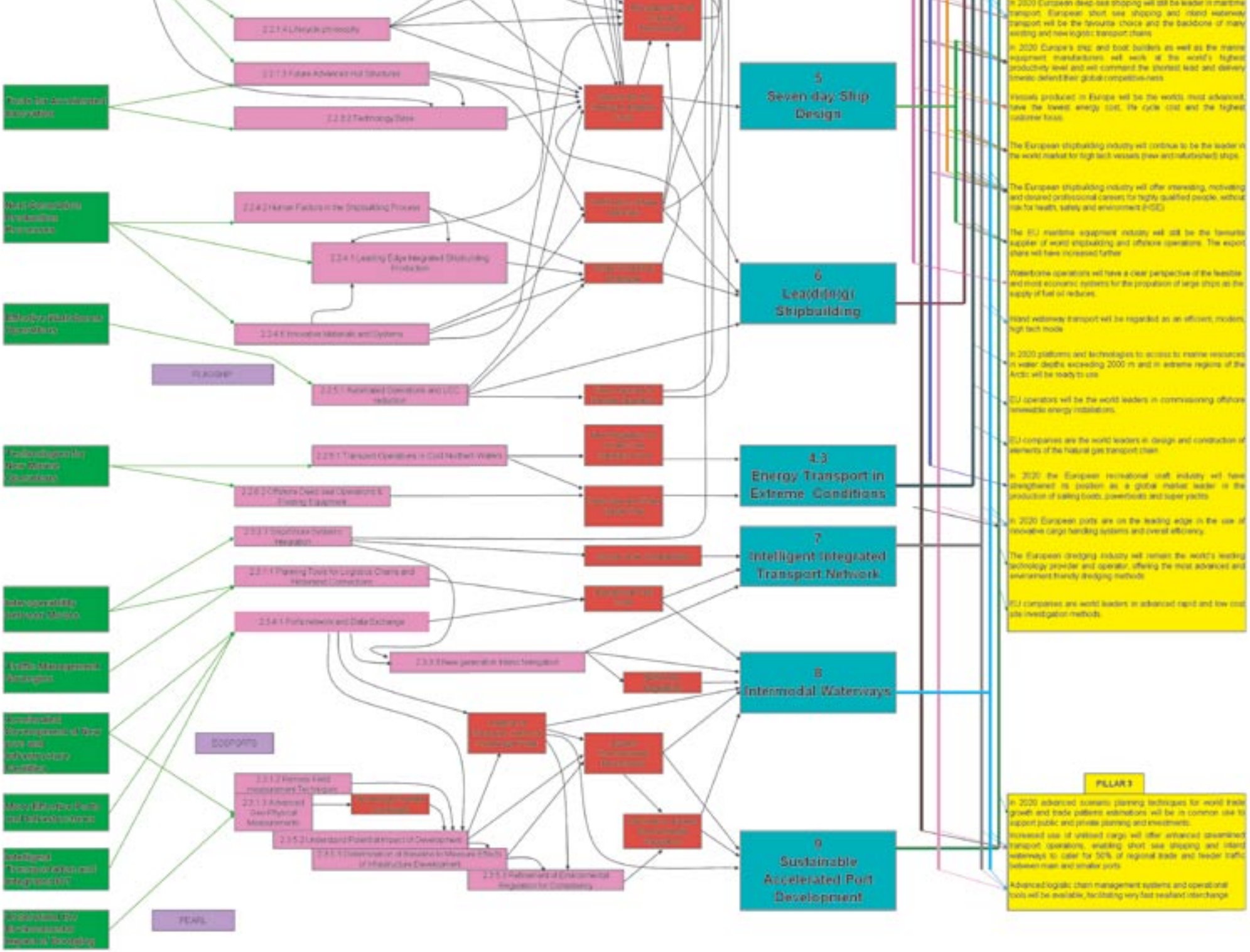


Figure 2 Route Map Overview

Jeroen F. J. PRUYN
Researcher, Delft University of Technology for the department of Ship Design, Production and Operations.
WP-leader for EUROMIND WP4

Euromind
Matching standards to requirements

Halfway through the EUROMIND project we take the time to look back. In the first half year standards have been searched, classified and some possible options have been selected. The second half year was spend on mapping the problems and requirements of the end-users, the employees in the primary process of the Maritime Industry. Now we look forward to combining these elements in several business cases and providing a direction and support for the solution of the problems.

EUROMIND set as its goal to make the industry aware of the huge losses of time and money in information exchange, to introduce in the industry a direction for a solution and to actually investigate the possibilities of this solution. No lack of ambition there. How does one pursue such goals on a European level? Due to the different states of awareness present in the countries participating in this project a reversed approach was chosen. As some sort of standardisation was deemed necessary, this was taken as the starting point. An inventory was made of the available open and semi-open standards in the Maritime and similar industries. The next step was to involve the industry on a national level and find out which major problems occurred during the exchange of information and what would be their main concerns considering the solutions presented by EUROMIND. These steps have been finished at the time of writing. We are now starting up several business cases in which the previous elements are combined and checked on their practicality. These clear and practical examples will serve as a basis for the dissemination documents that will be created in the last half year of this project.

Identification of standards

The first task for the EUROMIND team was to come up with a simple and structured way of classifying standards. For this purpose a template was developed, which allowed the each standard to be checked against a large number of possible qualities, like approach to a system, main users, which industry, level of detail, etc.

All members are searching for possible and relevant standards. The result of this exercise is a list of most promising standards for use in digital information exchange in the maritime industry. This classification exercise still continues today and new promising standards are still added to this list.

Brainstorming with Group Decision Rooms

"The EUROMIND team realised that to involve the industry we should address the problems living in the industry. This is easier said than done. There are many different players in the maritime industry, not only considering their fields of expertise, but also in their sheer size and level of integration. That's only talking about the companies as a whole, within each company there are various departments, all with a different view of the problem. Our last obstacle was the differences between nations. How could we collect data in a uniform way, while respecting

all these different opinions?", says Theresia Twickler, project coordinator.

EUROMIND decided to have national meetings and to make use of a technique for brainstorming called Group Decision Room. Ideas are typed into a computer and can in that same meeting be sorted, rated and evaluated. Other advantages were the availability of this tool over the internet and storage of the results. The choice for national meetings would allow every participant in these meetings to discuss ideas in their own language, minimising the loss of nuances.

Different problems in different processes

"In this manner we managed to reach 72 persons from the industry of 5 different countries. Unfortunately the response to such a meeting was not big enough in every country represented in the EUROMIND project; therefore efforts will be made to involve companies from these countries in the program of the next half year", says Theresia Twickler.

The major problem areas can be divided into five processes related to shipbuilding: Engineering, Procurement, Planning & Project Management, Work Preparation and Production.

What immediately sticks out in the results is the great difference in the number of problems mentioned for these different processes. In engineering nothing is fixed yet. Everybody is still moving around his objects, and a lot of coordination has to take place. Also the physical distance between employees of different companies is a lot larger.

In production the yard and subcontractors work side by side, in the same hall, on the same (then tangible) ship. Problems are solved then and there. In the beginning however, the employees are located in their offices and these are usually not located at one location. This will result in an increase in information to be exchanged digitally.

Hypothetical options for solving problems

EUROMIND was not only interested in the problems, but also in which direction a solution should be sought. To allow the participants to focus on different aspects of a solution hypothetical options were presented.

These options involved elements such as that every company and person would use software from the same software company. Even to such an extent that everybody would use the same version and that everything was integrated into one major program. This was never deemed feasible, but it would give the EUROMIND team an idea whether the problem would be susceptible to a software (only) solution.

"The results made two things painfully clear. A lot of problems could be classified as organisational problems, and not in one case would a tool alone be able to solve the problem entirely. In EUROMIND we were already aware of this. We do not seek to simply aid in the development of only a standard, but would promote to have this integrated into an exchange database, supporting the interaction between companies. Such a system will therefore have a major impact on the working processes and information organisations of the companies involved", says Theresia Twickler.

Developing business cases

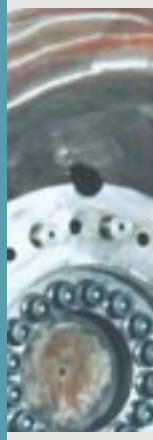
The last part of the Group Decision Room session was dedicated to explain the ideas developed by EUROMIND and to ask the audience what would be the major obstacles in implementing such a system. The 'Top 5' could be summarised as follows:

- Costs (development and maintenance)
- Barrier to enter (due to development work and changes needed in a organisation)
- Loss of competitiveness (because everybody can see your way of working)
- Change management would be made difficult when people access a system simultaneously
- Security issues (open access will result in lower security)

"In EUROMIND we will need to focus on these items in order to be able to motivate the industry in taking the measures necessary to stay ahead of the worldwide competition", says Theresia Twickler.

The Next Steps

Currently we are setting up the business cases, with shipyards and their suppliers. To get these companies interested and willing to participate, the problem tackled has to be close to home, for them. Due to this, concessions have to be made on treating all the major areas and problems, discovered throughout the past year. Still we have already been able to start up 2 national business cases and are trying to start up 2 international ones as well. As these cases are still in a start-up phase, it is way too early to discuss any results, but we are confident that the next half year will provide us with great insights and practical ideas on how to solve the practical sides of the problem (next to the theoretical ones). The business cases can be powerful tools to involve and educate the maritime industry in the future.



SAFEDOR
Project Progress and Achievements

The Integrated Project SAFEDOR has completed the second of four years and has presented key results during a public mid-term conference in May 2007 in Brussels. The key achievements are related to methods and tools supporting risk-based ship design, the risk-based regulatory framework to approve risk-based ships and systems and the first applications focusing on innovative ships and systems.

Wilfried HENSEL
SAM Electronics Authorized Representative
Maritime Systems Suppliers Representative
Member of the SAFEDOR Steering Committee

SAFEDOR is the first large scale project that develops a risk-based regulatory framework for the maritime industry and corresponding design tools to facilitate first principle approaches to safety, addressing the complexity of a fully comprehensive system.

Risk-based ship design and approval responds to the European maritime industries' need to deliver ever more innovative transport solutions to their customers. Risk-based ship design and approval also responds to the European society's need to have increasingly safer transport. SAFEDOR research activities distinctively address both aspects and, thus, deliver the foundation for Europe to sustain world-leadership in safety-critical and knowledge-intensive ships and ships systems.

The following key achievements of SAFEDOR were realized within the first two years of its duration:

Risk-based Design Framework
Two clearly distinct motivations for risk-based design can be identified. First, it is the realization of an idea for a new solution which challenges (possibly outdated) rules – meaning that the new solution cannot be approved. Risk-based design and approval are then used to identify the issues and prove that the new solution is at least as safe as required. Second, it is the optimization of a largely rule-compliant vessel aiming at increasing the level of safety at the same costs or to increase earning potential at the same level of safety. The developed risk-based design framework offers an enhanced decision-making to balance traditional objectives – performance and cost – with the new objective – minimize risk.The risk-based design decision-making eventually requires risk evaluation criteria. Two options are currently visible: safety equivalence or compliance against high-level criteria established at IMO.

Risk-based Approval Framework
A number of high-level Formal Safety Assessment (FSA) studies for ship types were performed within SAFEDOR to deliver high-level risk models, identify risk control options and to document the current level of risk per ship type. The studies followed the FSA guidelines.

Approving novel or risk-based designs requires an alternative path to approval and additional steps to be performed. A high-level approval process was presented, outlining a two-step process which offers a so called preliminary approval as first milestone. The preliminary approval follows a qualitative risk analysis of a potential design and summarizes the conditions which have to be fulfilled for the design to become approved eventually. The second part of the approval process for novel and risk-based designs is characterized by a risk analysis and subsequent assessment of risk control options.

Furthermore the approval process for risk-based ship systems was developed. The new approval process is also a two-step process and it can be applied to all safety relevant ship systems The process is structured into six phases: pre-approval, design, construction, installation and operation. In case of complex and innovative systems, a quantitative risk analysis is expected to be performed even during the pre-approval phase to minimize the project realization risk.

High-level risk evaluation criteria for use within risk-based design and approval were presented. These criteria include individual and societal risk acceptance criteria, a cost-effectiveness evaluation criterion related to life saving and appropriate background information to update the criteria.

Safety-performance Prediction Tools
Within SAFEDOR, several engineering tools to predict the

safety performance of a vessel in extreme and accidental conditions were newly developed or refined.

These development activities contained – among others:

- Frequency prediction of collision and grounding with enhanced operator modeling
- Prediction of the probability of propulsion and maneuvering systems' failure
- Fast prediction of structural damages after collision and grounding with an artificial neural network
- Structural reliability analysis of a damaged ship structure.
- A new method for fast prediction of the probability mass function for time to capsize for RoPax ferries
- A new approach to predict container cargo fires
- A new technique to create fault trees and FMEA tables from system descriptions inside a standard system simulation package.
- Prediction of probability of loss of intact stability

Applications

Eight design teams were tasked to develop innovative ships that are expected to be as least as safe as today but for formal reasons cannot be approved under the current rules or regulations. A design study, an economic study and a safety and environmental impact study were performed within the first two years of SAFEDOR for two cruise vessels, a fast full displacement RoPax ferry, a hybrid RoRo/RoPax vessel, a lightweight composite sandwich superstructure for a RoPax ferry, a short-sea LNG tanker, an open-top container vessel and an oil tanker. A formal selection of the best designs by a panel comprising the Steering Committee of SAFEDOR and independent experts and applying defined criteria resulted in two winning designs.

The winning design was the lightweight composite sandwich superstructure for a RoPax ferry which exemplifies the use of risk-based approaches to demonstrate safety compliance. The second winning design was the fast full displacement RoPax ferry which exemplifies the optimization potential for risk-based design and demonstrated the potential of a newly developed tool to predict flooding.

Application of risk-based approaches within SAFEDOR also addresses development of an innovative bridge layout and a number of novel life saving appliances. An innovative system to distribute electrical power was integrated into a RoPax ferry design and analyzed with respect to its safety compliance

Within the first two years, SAFEDOR has delivered eight prototype ship designs and, in doing so, partially validated the proposed methodology. Further validation is expected once the two winning ship system designs are completed.

Stimulus To The Industry

SAFEDOR - being the single largest EU-funded R&D-project on ship safety – brings together a partnership of 53 organizations and adds stimulus to the maritime industry by organizing public events discussing risk-based ship design and approval as an alternative approach to ensure safe and competitive ships. The organised public events and the training courses served to transfer systematically knowledge to the wider maritime community

SAFEDOR partners also contributed to the development of goal-based standards (GBS) at IMO through active participation in the working groups at MSC and in the correspondence groups.

Risk-based approaches have now been recognized as important elements to sustain competitiveness by the European shipping, shipbuilding and equipment industry. The Vision 2020 and the corresponding Strategic Research Agenda of the Technology Platform WATERBORNE include risk-based and goal-based approaches as key priorities.

Conclusions

Within the first two years of its four years duration, SAFEDOR has significantly progressed. A risk-based design and a risk-based approval framework have been established and partly published. A number of new tools to predict safety performance have been developed and validated. A series of innovative ship designs was developed and two winning designs selected for further refinement and preliminary approval. And a number of public events have been performed to attain more acceptances of the new approaches.

However, work remains for the next two years of SAFEDOR to conclude development of innovative ship designs and novel ship systems, finalize two more FSA studies, complete the risk-based regulatory framework and to finalize the development and to demonstrate the integrated design environment for efficient risk-based design

Reference:

First Achievements of SAFEDOR
3rd International Maritime Conference
on
DESIGN FOR SAFETY
September 26-28, 2007
Berkeley California.

To find more information on SAFEDOR as well as a collection of public documents, please visit www.safedor.org.

Flagship IP

Bernard DOGNAUX
Former Secretary General of EMEC

The aim of FLAGSHIP is to reduce the risks to life, the environment and vessels from waterborne transport while enhancing the competitiveness of European maritime transport. FLAGSHIP thus fits squarely into the concerns of the "Safe Maritime Operation" topic of Objective 4 "Increasing Road, Rail and Waterborne Safety and avoiding traffic congestion".

The emphasis of the project is on monitoring, inspection, navigation, and management systems of ships and the development of incentives and controls to maximise the utilisation of effective tools, processes and procedures. FLAGSHIP will also develop decision support tools for day-to-day operation as well as emergency response. These goals are totally in line with the strategic goals set out in the European Commission document 'Transport Policy to 2010: time to decide'.

FLAGSHIP is focusing on onboard and onshore inspection, maintenance and operation support systems, to shorten the time required to identify and prioritize equipment or elements that need maintenance or repair. Technical condition monitoring, life cycle use of electronic documentation and electronic exchange of equipment and ship information with equipment manufacturers, repair yards and post-repair inspection authorities, are also part of the project.

The systems developed will have a modular architecture and will fit in integrated bridges with a generic core that is applicable to a range of vessel types. Testing and validation will be included for three different vessel categories. The developed tools include decision support tools for on-board operations in routine and emergency situations; automatic notification and transfer of updated rules and regulations; on-line link between ship-to-ship and ship-to-shore for better management of accidents and e-learning; remote diagnostics and maintenance systems for on-line crew support enhanced by continuously updating safety and environmental indicators for the ship in question; cargo operation and handling, including real-time scheduling; and monitoring systems for real-time assessment of structures and components including environmental surveillance.

The rapid development of satellite communication and the Internet have provided the means by which data can be gathered instantaneously and in large amounts.

However, data is not knowledge , it is only the pre-requisite for knowledge.

Knowledge results from analysing the data and processing it intelligently so that it can be acted upon either in an automatic fashion or by humans which are either acting in isolation or in an integrated (though possibly geographically fragmented) group.

And FLAGSHIP is developing not just the infrastructure for collecting data but also the processing capability for extracting knowledge out of data and use it in on-board operations in routine and emergency situations, remote diagnostics and maintenance systems and in the provision of safety and environmental indicators for a whole shipping operation. The framework for integrated decision support systems will be based on an open architecture to facilitate easy

integration with existing on-board systems (e.g. propulsion, hull, navigation, flooding, fire, ventilation etc). Cargo operation and handling, including real-time scheduling will be addressed, as well as monitoring systems for real-time assessment of structures and components and environmental conditions. The tools and procedures will be based on open systems for on-line link between ship-to-ship and ship-to-shore, extending not just to communication with owners/management office but to all relevant actors involved in co-operative decision support both for day-to-day operations and better management of accidents. This also includes automatic notification and transfer of updated rules and regulations between ship, management office and agent. The project will address the impact of new technologies on HSE (Health, Safety, Environment) requirements, and organisations onboard and ashore, and will take into account the next generation of navigation, communication and reporting technologies as well as upcoming IMO and EU rules.

Project findings and developments will be implemented and demonstrated on board three different vessel categories.

The project will create a number of systems and tools supporting the overall vision. A few highlights are given below:

Monitoring systems for real-time assessment of hulls will extend the life of the existing fleet of Tankers and Bulk Carriers by up to 5 years with a 10% to 20% reduction in service repair costs for ships throughout the life-cycle.

Monitoring tools for fuel efficiency indicators shall assist ship owners to improve energy efficiency up to 10%. The upper limit of energy efficiency will be established with ± 5% uncertainty. The efficiency of the ship operation will be quantified with a maximum of 10% uncertainty.

The efficiency of on-board general decision support systems will be evaluated using a standard measurement method. This covers aspects such as speed of response, cooperativeness, usefulness, comprehensibility, ergonomics of user interface, etc. The decision support frame will reduce the time for an inexperienced user's decision by a factor of 2 compared to present bridge installations.

The adaptive user interface will reduce operator workload in repetitive scenarios by a factor of 2.

A factor 2 improvement will also show up in support systems for nautical operations, and in particular in increased awareness of the navigation scenario, increased safety of nautical decisions and in the increased speed of nautical decisions.

Alarm filtering will reduce bridge alarms in a given scenario (breakdown in auxiliary systems) by 50% and in the general operational scenario (for a passenger vessel) by 20%.

Support systems for rule compliance will improve the speed of text look up with at least a factor 2 while also improving the quality of the search. The target is minimum 99% of all relevant correct references and a reduction of 50% of "false positives".

Proper container scheduling will reduce congestion and the corresponding air pollution. Scheduling and repositioning of empties (which will in itself be a part of scheduling) will distribute the load more evenly along the day, cutting average waiting time and therefore reducing queues and speeding up the containership's operations. Reductions in terminal congestion and concomitant pollution will automatically translate into reductions of urban congestion and urban pollution.

A prognosis and assessment tool for emergency management will demonstrate improved accuracy of damage topology assessment by 5 to 10% and 2 to 10 times improvements in prognosis generation speeds and result reliability in the different domains of fire and smoke propagation, hull damage and flooding.

EMEC is playing a crucial role in this ambitious project. Via EMECRID and the EMEC's members being partners of the project, EMEC will, once again, demonstrate its capacity to be an inescapable actor to tackle the future competition challenges and actively contribute to a clean, safe and efficient maritime transport.

EMEC is involved in several Work Packages, is member of the Management Board and the Advisory Group.

Patrick PERSON
ERASTAR Technical Coordinator

ERASTAR main results

As a reminder, ERASTAR is a coordination action, funded 100% under FP5, mainly focused on the promotion of the submission of projects dealing with shipbuilding and shiprepair, to be funded under the different FP. This network of 42 partners (10 shipyards – 11 manufacturers – 2 classification societies – 13 research centers – 6 maritime universities) has worked from 01/01/2003 to 30/04/2007) with a budget of 2 millions €, and its results are quite correct.

Six events have been organised for the promotion of projects, corresponding to three calls: 2 for FP6, 1 for FP7. The average number of people attending was 85. The table here below shows the number of projects discussed or proposed during each event, compared to the total number of projects submitted to EC.

FP	CALL	PROJECTS DISCUSSED	TOTAL NUMBER SUBMITTED
6	2	46	55
6	3	37	59
7	1	50	80

The number of retained projects from the events and the corresponding funding, compared to the totals is more impressive.

		NUMBER OF PROJECTS			
				FROM EVENTS	
FP	CALL	TOTAL RETAINED BY EC	TOTAL FUNDING	NUMBER	FUNDING
6	1[1]	19	67 M€	14	61 M€
6	2	22	59 M€	19	56 M€
6	3	17	60 M€	10	40 M€
TOTAL FP6		58	186 M€	43	157 M€

For FP6, these networks have reached the following results:

- 43 projects discussed or proposed by the network, retained, out of 58 retained in total (74%)
- Funding obtained by the projects discussed or proposed by the network of 157 M€, out of 186 M€ in total (84%)

[1] Events organised by CEPS and PRODIS, the ancestors of ERASTAR

This shows the importance if such a network and the necessity to pursue for FP7 this kind of coordination action.

The other target of ERASTAR was to establish and update the future R & D needs and priorities of the different technical domains of the shipbuilding industry:

- Hydrodynamics and Structures
- Ship systems and functions
- Design Techniques and Processes
- Shipyards management, Logistics and Planning
- Production Techniques and processes
- New ship concepts

Two approaches were used to reach this target:

1. to analyse the results of the most promising projects funded under FP5 and FP6, and to indicate the critical technology concerned in each above technical domain, by each result. A matrix was then established for each technical domain, showing which critical technologies were not covered by the results of the projects.

As an example, for the SHIP SYSTEMS (PROPULSION PART), the following critical technologies correctly by the recent projects:

- alternative fuels
- fuel cell marinisation
- efficient heat exchangers
- superconducting motors

2. to organise technical events (based on a specific technical domain) or regional workshops (based on the R & D needs of the regional main companies, yards or equipment manufacturers)

Five technical events (TE) and 3 regional workshops (RW) have been organised as shown hereafter.

NATURE	LOCATION	CONTENT
TE	Flensburg	Production Techniques
TE	Duisburg	Short sea shipping and inland shipping
RW	Papenburg	E-commerce (Meyerwerft)
TE	Derby	Ship Systems
RW	Espoo	AKER YARDS FINLAND priorities
TE	Genoa	Hydrodynamics and Structures
RW	Glasgow	UK Priorities
TE	Bremen	IT (CAD, CIM...)

The average number of people attending was about 50.

Each event or workshop was concluded by a list of R & D priorities to be studied in the near future.

As an example, for the shipsytems (propulsion part and electrical systems) in DERBY, the outcome was:

- automation, navigation, control by wireless technology
- high efficiency power converters
- superconducting machines in MW range
- fuel cells in MW range

As already stated, the interest of such a coordination actions for the shipbuilding and shiprepair industry, and even for the entire maritime transports, is evident ; and the corresponding efforts should be pursued, if possible under the management and with the financial support of our WATERBORNE TECHNOLOGY PLATFORM.

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