

MEANING OF EUROPEAN RTD ACTIVITIES FOR THE POLISH MARITIME INDUSTRY

1. MARITIME INDUSTRY IN POLISH ECONOMY

The main sectors of Polish maritime industry are as follows:

1. ports
2. deep sea and short sea shipping
3. shipbuilding industry
4. seagoing fishing
5. offshore enterprises – oil and gas exploitation

Transformation of Polish economy covered also the maritime industry, though its range and results were different in different sectors of maritime economy. The analysis of the data that describes the effects in the maritime industry, that was included in the elaboration entitled “Tendencies in Polish Maritime Economy in the 90’s”, edited by Szczecin branch of the Main Statistical Office (Warsaw – Szczecin, 2001), allows for formulation of a number of the statements listed below:

1. In 1993-2000 the number of maritime economy entities significantly increased: from 3788 in 1993 to 8488 in 2000. At the same time the decreasing number of persons employed in the entities was noticed, i.e. from nearly 120 thous. in 1993 to almost 100 thous. in 2000. The analysis clearly indicates that the share of private sector was increased. This share was different in particular kinds of activity. (Fig. 1)
2. The growing tendency in value of investment outlays (at current prices) and sales revenues of products in 1995-1998 was noticed. Unfortunately this tendency was broken down in 1999 and it covered majority of fields. (Fig. 2 and Fig. 3).
3. Polish seaports were handling average about 50 mln tons of cargo annually. There is noticed the insignificant increase of transit turnover (Fig. 4). At the same time the international passengers transport was increased: the number of passengers in international traffic increased seven times in 1991-2000 years (Fig. 5).
4. The number of ships serviced by ports increased, but their average net tonnage decreased almost twice (Fig. 6)
5. Share of sea transport in service of Polish foreign trade goods in 1992-2000 reached about 40%, however the downward tendency in imports was observed, i.e. from over

30% at the beginning of the decade to almost 16% in 2000 year (Fig. 7). The transport in relation with European countries was predominant.

6. The clear decrease of ship number and their DWT was observed, but the number of ships of foreign flag increased (Fig. 8)
7. In the first half of 1991-2000 decade one can notice that the number of seagoing ships built in Polish shipyards increased significantly, however in the second half of decade the production was stable at the level of 33-34 ships per year. At the same time the total capacity of the built ships was increased. It reached in the range from 600 thous. to 900 thous. DWT in the second half of decade (Fig. 9).
8. In the fishing fleet there was noticed decrease of deep sea fishing fleet, i.e. from 65 to 24 ships as well as decrease of fishing cutters' number, i.e. from 456 to 417, however the fishing boats quantity was increased (Fig. 10).
9. The fish and another sea creatures catches were decreased by a half in the analyzed period, i.e. from over 400 to 200 thous. tons annually (Fig. 11).
10. At the beginning of 90's the Polish deep-sea oil mining was activated. The oil output from the deposits located under Baltic Sea bottom made by Petrobaltic increased from 20,2 thous. oil tons in 1992 to 309,7 thous. tons in 2000 year. This output made up merely 1,7% of national consumption (Fig. 12).

The above-mentioned data clearly indicates that in an optimistic conclusion, majority sectors of Polish maritime economy are characterized by regress or stagnation. The exception is the Polish shipbuilding and ship repairing industry. However, currently this industry has serious problems of financial nature in spite of the fully order book for 2-3 years in advance. The mentioned difficulties were caused by many different reasons. The main ones are: low prices of ships as a result of Far East shipyards' competition and high prime costs of Polish shipyards. Taking into account the exchange rate of PLN to USD, which is unfavorable for Polish exporters and augmented the Polish shipyards problems beside the fact that there is no State subvention, it is a hard task for shipyards to work out even the minimum required profit. The second ordered reasons of the mentioned financial problems could be mentioned as: difficulties related to production process of new types of ships and lower – in comparison with European Union shipyards – productivity at high quality of offered products traditionally.

The most important factor that could and should change the described situation is the innovativeness increase of Polish maritime economy that will result in the competitiveness enhancement. In the introduction to the book entitled “Science – Technology – Economy”, edited by Polish State Committee for Scientific Research in 1995, the editor Prof. Antoni Kukliński wrote: “If at the turn of XX and XXI centuries the Polish society and economy do not amass their abilities within creation and absorption of the innovations, then in the next millennium we will function as a peripheral country. The problem of innovative thinking and activity will become dramatic at the moment, when Poland joins the European Union as full member. The Poland’s space will become open in the European and global scale. The open space that is not considered as innovative one will turn to the dependent space in economical, political and scientific sense of meaning.”

The above-mentioned statement regarding the entire Polish economy should be also referring to the Polish maritime economy. As everybody knows that the base for innovation is research and development activity, therefore researches are significantly important for future of Polish maritime economy.

2. RESEARCH AND DEVELOPMENT NEEDS OF POLISH MARITIME ECONOMY

The following institutes and organizations carry out researches in support of Polish maritime economy:

- Maritime Institute, in the field of shipping and ports;
- Sea Fisheries Institute, in the field of marine biology and fisheries;
- Ship Design and Research Centre (CTO), in the field of ship and vessel design and building, as well as dissemination of different kinds of information;
- Marine Technology Centre, in the field of systems and equipment related to the marine defense forces.

Additionally, different institutes of Polish Academy of Science, universities and technical universities in Gdańsk and Szczecin, Maritime University of Szczecin, Gdynia Maritime Academy and Naval University of Gdynia also realize research measures.

The activities of above mentioned institutes and organizations comprise the basic research field, as well as the applied researches.

In the old centralized Polish economy system, up to the end of 80's, the Central Research and Development Program was the main base of activities. In this regard, two sub-programs were related to the maritime economy: CPBR 9.2 and CPBR 9.5. From the beginning of 90's the central administration of State is concentrated and limited to expression of research and development priorities. The last version of such a document is delivered at the end of 2000 by the State Committee for Scientific Research (KBN). However, it does not formulate particular priorities related to maritime economy and provides some general aspects of transport, using only the words of "waterborne transport". In my opinion here there is an obvious effect of lurching the ideas of European Commission delivered through Framework Programme of European Union. The mentioned priorities are shown in the figure 13.

3. EUROPEAN PATTERNS – CTO INITIATIVES

Since 1997 and based on the recommendation of The Association of Polish Maritime Industries "FORUM OKRĘTOWE", Ship Design and Research Centre (CTO) has been participated in COREDES and its activities. A year later, Gdynia Shipyard S.A. and Szczecin Shipyard S. A. were connected, too. Among other benefits, COREDES membership brought us access to information on research needs and activities of maritime industry of European Union. Taking into account the EU MASTERPLAN of Research and Development in Maritime Industry as a pattern, CTO in contribution with the both mentioned shipyards elaborated a document entitled "Research and Development Needs of Polish Shipbuilding Industry". This document includes two parts: Part A, which formulates the mentioned needs by a general expression and Part B, which consists the list of proposals delivered or confirmed by Polish enterprises related to shipbuilding industry, i.e. shipyards, as well as marine equipment manufacturers. Part B contains the list of proposed research projects for realization under European programs (mainly FP5) and also projects with national dimension such as Applied Projects, financially contributed by the State Committee for Scientific Research (KBN) or private orders (pure commercial orders). This part of the document is considered to be updated every year. Up to now, two editions of "Needs" have been delivered: the first in Nov. 1999 and the second in Oct. 2000. Indeed, both editions are limited to those research and development needs, which are mainly related to the ship design and shipbuilding. At the end of 2001 a working group was established, which beside CTO, Gdynia Shipyard and Szczecin

TRANSPORT – SYSTEMS AND MEANS

BASIC RESEARCHES

1. Modeling of transport systems by applying the theory of systems, intelligent structures, probability methods, chaos theory, heuristic methods, neural network methodology, operational researches and mass service theory.
2. Integration of surveying activities in transport – principles and models.
3. Environment impacts of transport and environment protection methods against such an influence.
4. Investigation on heat-flow phenomena in the mono and multiphase mediums by applying computer-based simulation methods.

RESEARCH AND DEVELOPMENT PROBLEMATIC

1. Establishing the knowledge bases and monitoring of worldwide and domestic transport systems, emphasizing on multi-modal transport.
2. Investigation on mobility processes and development of modern transport infrastructure.
3. Traffic control methods and organization and management in the integrated transport systems.
4. The means of safety, reliability and organizational efficiency enhancement in transport.
5. Electronics and telecommunication systems in transport.
6. Development of new agricultural, disposable, transport and uninhabited plains and gliders.
7. Modernization of air plains and helicopters, used in civil and military Polish aviation sectors.
8. Development and improvement of modern means of land, railroad and marine transports.
9. Adaptation of transport means with required international standards and particularly European Union ones.

TRANSPORT - PROPULSION

BASIC RESEARCHES

1. New fuels for engines, processes of treatment of combustible mixtures, unconventional combustion methods and computer-based simulation of these processes.
2. New measurement, diagnostic and control methods related to vibration and noise and dynamic methods of reduction of the hazards.

RESEARCH AND DEVELOPMENT PROBLEMATIC

1. Unconventional propulsion systems (stationary, traction, aero and spaceship propulsion).
2. Adaptation of existing propulsion systems – improvement of their exploitation, operational and ecological features.
3. Engine operation control – methods and technologies.

Fig. 13

Shipyard comprised Northern Shipyard and Gdańsk Ship Repairyard “Remontowa”. Not till then, this working group formulated the needs of Polish shipbuilding and ship repair in a wider range, taking into account in addition such problems as the meaning of shipbuilding industry for the national economy, investigation of demand trends for new ships, financing systems of shipbuilding process, innovation in production and processes, as well as organization and management in the Polish shipbuilding industry. The main goal of this elaboration, first of all, is improvement of competitiveness of Polish shipbuilding and ship repair industry, satisfying the productivity and profitability growth and maintaining the traditional high quality of its products.

The above mentioned documents, as well as the outcomes of recently called working group have been delivered to the appropriate State central administration organs for taking into consideration the research and development needs of shipbuilding and ship repair industry into the national programs and for expressing the assumption and base of scientific-technology and pro-innovation State strategies.

From the beginning of working on research and development needs of Polish shipbuilding industry, it was clear that these challenges –similar to the EU ones- should include the whole maritime economy. However, lack of an organizational form, under which such a task could be realized was obvious. Recently, due to supporting from the central and regional State administration side, CTO joint to realization the idea of conferring the organizational form to FORUM MORSKIE, which has been existed for more than 10 years in CTO as thematic conferences, assembling different actors of Polish maritime economy. The last conference (38th) was held on Feb. 20, 2002. It gathered the representative of ship owners, ports, shipyards and ship equipment producers, research institutes and related administration with a central and regional dimension. During the conference these representatives supported the idea of conferring FORUM MORSKIE an organizational frame, similar to the European organization “Maritime Industry Forum” (MIF).

One of the most important objectives of this organization will be formulating and expressing research and development needs of Polish maritime industry, correlated with EU needs and directed toward active participation in the 6th EU Framework Programme through European Research Area.

4. POLISH MARITIME INDUSTRY IN THE 5TH FRAMEWORK PROGRAM OF EUROPEAN UNION

The above-mentioned memberships of CTO – since 1997 – and later Gdynia Shipyard S.A. and Szczecin Shipyard S.A in COREDES, opened for the Polish enterprises and institutions the way to the information concerning the R&D activities for the benefit of the maritime industries of the European Union. But only the decision of the Council of the European Union Association - Republic of Poland from the August 1999 enabled the Polish enterprises and institutions participation in the 5th Framework Programme. Thanks to this decision the wide possibilities of the integration with the European science for the Polish R&D institutes have been opened. Polish institutes have almost the same opportunities as the institutions of the EU member countries. The most important potential profits of the Poland participation in the 5th Framework Programme are as follows:

- exploitation of the Polish scientific-research potential and intensification of the co-operation with the European Union;
- possibility of obtaining the essential financial sources for the researches execution;
- access – on the basis of the knowledge ownership – to research projects' results of the strong multinational consortiums;
- usage of experiences regarding the research results' implementation and of marketing activities.

The European Union framework programs are characterised by the great number of various forms of their execution. The research projects are the most important ones. The participation in those projects is executed on the basis of a competition. Regarding the FP5, there were few deadlines of the proposals submissions. Considering the Key Action “Land Transport and Marine Technologies”, where the first proposals are submitted by the Polish maritime economy, its first deadline was 30 June, 1999, and second – 31 march, 2000.

The participation in the above mentioned two calls is shown in **Table 1**. The acronyms of the projects being executed together with Polish shipyards, ship owners, technical universities, design offices and research institutes are shown in **Table 2**.

It can be considered as a success that the Polish institutes have been participated in 8 projects out of 35 financially supported by the European Commission in the maritime technology area. The picture shows the different results when the percentage of the Polish institutes financial share is taken into consideration – it is less then the average value for the member countries.

One of the reasons of such a situation is distinctly lower cost of the personal month of the Polish contractors.

Table 1: Polish Maritime Economy in the 1st and 2nd Calls of KA3 „ Land Transport and Marine Technology ”, TP „ Growth ”

<i>Polish Partner</i>	<i>First Call: 30.06.1999</i>		<i>Second Call: 31.03.2000</i>	
	<i>Approved</i>	<i>Submitted</i>	<i>Approved</i>	<i>Submitted</i>
Szczecin Shipyard S. A.	1	3	1	5
Gdynia Shipyard S. A.	1	2	1	3
Technical University of Gdańsk	1+1*	1+1*	-	-
Technical University of Szczecin	-	-	1	1
Technical University of Wrocław	-	-	1	1
ODRATRANS S. A.	-	-	1	1
NAVICENTRUM Ltd.	-	-	1	1
CTO	2	7	3	6

*) as the subcontractor of CTO

Table 2: Situation of Polish Maritime Economy Participation in FP5 under KA3 of TP „Growth” after the Second Call

<i>Acronym</i>	<i>Coordinator</i>	<i>Polish Partner</i>
OPTIPOD	ALSTOM CHANTIERS DE L'ATLANTIQUE	Gdynia Shipyard S.A., CTO
HARDER	Det Norske Veritas, Moevik	CTO, TU Gdańsk*
SANDWICH	Jos. L. Meyer GmbH, Papenburg	TU Gdańsk, OE&ST Fac
MOBISHIP	Kvaerner Masa Yards, Inc.	Szczecin Shipyard S.A.
DYCONET	BALance Technology Consulting GmbH, Bremen	Gdynia Shipyard S.A.
INBAT	EUROPÄISCHES ENTWICKLUNGSZENTRUM FÜR BINNEN-KÜSTENSCHIFFFAHRT VBD	CTO, TU Szczecin, TU Wrocław, ODRATRANS S.A., NAVICENTRUM Ltd.
EROCAY	HSVA, Hamburg	CTO
VRSHIPS-ROPAX2000	University of Strathclyde, Dept. Of Ship and Marine Technology	Szczecin Shipyard S.A., CTO

*) as the subcontractor of CTO

The participation of the Polish partners from the area of the maritime industry in the proposals submitted to the last calls of the 5th FP at the end of the year 2001 and at the beginning of the year 2002 has been significantly increased comprising not only the Key Action “Land Transport and Marine Technologies” but also others Key Actions and Thematic Programmes. Additionally, number of Polish institutions involved in proposal preparation process increased, including among others, Gdynia Maritime Academy and Szczecin Maritime University. These proposals not only concern the RTD projects, but also Technological Platforms, Thematic Networks, Demonstration Projects and Accompanying Measures. Within the range of the last form some of the Polish institutes, R&D units and technical universities from the maritime area submitted also proposals devoted to establishing the centres of excellence. Among others CTO submitted the proposal concerning establishing a Competence Centre for Maritime Technology Applied Research, shortly called **CEMTAR**. This Centre should collaborate with similar R&D institutions both in the European Union, as well as in the Newly Associated States and in the East-European countries.

Regarding the above mentioned new proposals, CTO participates in 16 of them, i.e. 8 RTD projects, 3 Thematic Networks, 3 Accompanying Measures, 1 Technological Platform and 1 Demonstration Project. Some details of these proposals are shown in the **Tables 3**. The results of the call with the deadline on 17th September 2001 are already known. CTO participated in 10 proposals submitted under this call. Fifth of them were successfully approved. They are: 3 RTD projects having the following acronyms: FASTPOD, EFFORT and LEADING EDGE, one Thematic Network with the acronym ERASTAR and one Technological Platform with the acronym INTEGRATION.

There is no doubts that taking into account the scientific-research potential and also the R&D needs, the participation of the Polish maritime economy in the research programs of the European Union should be wider, especially in the 5th and 6th Framework Programmes.

The circumstances under which many companies and institutions from the maritime industry distance themselves from the participation in the above-mentioned projects are the following:

- lack of experience in the European Commission co-operation with;
- lack of the clear coupling between research activity and possibility of its market implementation;
- human resources shortage;

- lack of the precise information dissemination channel.

The human resources problems can be partly solved by better co-operation between research and development institutions of the maritime industry, which is still considered unsatisfactory. The low experience regarding the co-operation with European Union and the bad information could be a challenge for the contact points such as National Contact Point for the 5th Framework Programme operating within the structures of the Institute of Fundamental Technological Research, Polish Academy of Science as well as for the so called Branch and Regional Contact Points. For example the 5th Framework Programme Branch Contact Point for Maritime Industry has been established in CTO. It is supposed to enhance the shipbuilding related companies participation in the European projects, especially in the case of Small and Medium Enterprises.

However, the main task that must be solved by the Polish maritime industry in the R&D area is its maximal inclusion into the 6th Framework Programme of EU. It is indispensable for the increasing of competitiveness of this industry, first of all through the growth of its knowledge-based innovation. Therefore the Polish maritime industry, i.e. the shipyards, ship owners, R&D units, as well as regional and State administration support the idea of marking out the separate pillar in the 6th priority area of the next Framework Programme, devoted to the R&D needs of the surface transport with separate, dedicated budget. We are also of the opinion that for the further development of the European waterborne transport, first of all short sea and inland shipping, there is a need to keep and develop shipbuilding industry in European Union, which should be a leader of innovation in the world range. Therefore, the European Union shipbuilding should be mentioned in the documentation of the FP6 beside the waterborne transport. We believe that the Polish maritime industry, supported by the European and harmonised national R&D activity, will find its place in the European Union when the Republic of Poland becomes the full member of the Community.