

**SHORTSEA'96 Bergen**

## **Research in Shortsea Shipping: the State of the Art**

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## **Abstract**

*There has been an explosive growth in shortsea shipping related research during the last six years. In this period there have been about 80 papers presented at the three European Research Roundtable on Shortsea Shipping conferences to date (1992, 1994, and 1996). In addition, the three FAST international conferences on fast waterborne transport (1991, 1993, and 1995) presented close to 300 papers, of which about 70 directly focus on shortsea shipping. Various projects, national and international, have been also initiated in this area. In the context of the 4<sup>th</sup> Framework Programme, the European Commission/ Directorate General for Transport (DGVII) has launched in early 1996 several shared cost projects, as well as a concerted action explicitly targeted to shortsea shipping. Other directorates such as DGXII and DGXIII have also launched related projects in early 1996. In view of such a boom of research activity, it becomes imperative to critically survey such work, and also make a taxonomy of it, so that all this work is sorted out, and the baseline for further research becomes clear. Failure to do this will inevitably result in duplication of effort, gaps in research, lack of vision on what is needed, and other negative ramifications. The purpose of this paper is to carry out a critical survey and taxonomy of such work. The survey has involved a European-wide solicitation of input on related work, and also a collection of input from other sources. The paper also presents a software tool developed to assist in information entry, update, and retrieval, and also attempts to identify common trends on research topics. Without claiming that the contents of the paper are encyclopaedic, or that each and every piece of material collected has been reviewed in depth, we can at least claim that the 442 entries catalogued represent an unprecedented compilation of material in this area. Perhaps the most important trend identified within this vast collection the material is a significant degree of “fragmentation” of R&D effort in the SSS field, in the sense that problems that are methodologically similar in many contexts have been typically addressed in isolation. The most obvious consequence of this fragmentation is that the impact of R&D efforts to serve the real needs of European SSS has been so far limited. Commission-sponsored activities such as the SSS Roundtable Conferences, the Concerted Action on SSS, the collaborative R&D projects under way, and other related activities are expected to alleviate this situation in the future.*

## 1. Introduction

Shortsea shipping is one of the least subsidized modes of transport in Europe, at least compared to its land-based competitors, such as road and rail transport. The true costs of the latter (including environmental costs) are not fully internalized, and as a result of this distortion there is severe congestion in the European road and rail freight networks, and severe environmental and social impacts. The Commission's White Paper on the future development of a Common Transport Policy-CTP (COM(92) 494 final) clearly states that the CTP should minimize such distortions by focusing on environment-friendly modes such as shortsea shipping.

Shortsea shipping is thus emerging as an important focal point of the transport policy of the European Union. As intra-European borders are rapidly being dismantled, and Eastern Europe is gradually becoming more open, shortsea shipping's significance gains a prominent role, and its potential in enhancing the EU's competitiveness, economic and social cohesion, and sustained mobility is very real. Developments in information technologies and telecommunications have significantly increased the potential for efficient intermodal transport, which opens new horizons for shortsea shipping.

Addressing the entire spectrum of problems in shortsea shipping is a monumental task. It calls for (among other things) significant R&D to determine policy priorities in this area. Fora such as the Maritime Industries Forum and various conferences deal with many of the relevant issues. Much of the necessary R&D is being sponsored by the Commission. Individual countries are also sponsoring related programs.

It is fair to say that the growth in shortsea shipping related research during the last six years has been explosive. Conferences such as the European Research Roundtable in Shortsea Shipping (1992, 1994, and 1996) and the FAST international conference on fast waterborne transport (1991, 1993, and 1995) have collectively presented about 150 papers directly focusing on shortsea shipping and close to 250 others peripherally related to the subject. In addition, various projects, national and international, have been initiated in this area. In the context of the 4<sup>th</sup> Framework Programme, the European Commission/Directorate General for Transport (DGVII) has launched in early 1996 several shared cost projects in areas related to shortsea shipping, as well as a concerted action explicitly targeted to shortsea shipping. Other directorates such as DGXII and DGXIII have also launched related projects.

In view of such a boom of research activity, and in view of ambitious plans for further research in this area (5th Framework Programme, to state one example) it was felt that the time was ripe to take stock and critically survey such work, and the baseline for further research becomes clear. Failure to do this would inevitably result in lack of knowledge on where one stands, duplication of effort, gaps in research, lack of vision on what is needed, and other negative ramifications.

In that context, the purpose of this paper has been to carry out a survey and taxonomy of such work.

The goal of compiling a comprehensive "inventory" of shortsea shipping related research presents a number of significant difficulties. These following two are the most important:

1) Lack of an unambiguous delineation of the field: Does a paper or a project on the hydrodynamic or structural analysis of fast catamarans belong to shortsea shipping? Is a project on risk analysis in coastal waters a shortsea shipping project? What about projects on integrated ship control, marine propulsion performance, or the analysis of maritime law? Even though shortsea shipping is a multi-disciplinary field, there are no unique answers to these questions, much of which are matters of subjective judgment. This paper is no exception. As in all surveys, the composition of material in this paper is in many ways (although by no means exclusively) a product of our judgment call on what should be included in it and what not.

2) Lack of information on every conceivable project, paper, or related work: Much of the material in this paper has been provided to the authors by individuals who undertook the task of collecting such information either for a specific country (eg, Finland or Italy), or for a specific discipline related to shortsea shipping (eg, telematics or ship design). In either case, there is absolutely no way to guarantee that information collected is absolutely complete and up to date. In this paper, this has been manifested by a lack of complete homogeneity of the collected material, some of which is very detailed, and some is very general.

In spite of the above two main difficulties (which will be further elaborated upon in the sections that follow) we feel that the results of this paper are interesting and significant, for at least the following reasons:

- a) They represent, to our knowledge, the most extensive array of information on shortsea related work that has been compiled to date. This information can form the baseline for further research in this area.
- b) A concrete methodology for indexing, classifying, and further updating this information has been developed, including a user-friendly software package that can be used for entry, retrieval, update, and searches of related material.
- c) The material collected shows, in our opinion, a significant degree of “fragmentation” of R&D effort in the SSS field, in the sense that problems that are methodologically similar in many contexts have been typically addressed in isolation. This situation can only be remedied by aggressive dissemination of research results (including those of this paper) and by common fora of discussion of issues among all involved players.

The rest of this paper is organized as follows: Section 2 presents the approach that was followed. Section 3 gives an overview of collected material, broken down by source. Section 4 describes the software. Section 5 draws conclusions. Finally section 6 is a bibliographical list of all collected material.

## **2. Approach**

Work that has been surveyed has focused primarily (but not exclusively) on Europe, and has fallen into at least the following categories:

1. National research programmes or studies, either privately or publicly funded.
2. EU research programmes or studies.
3. Demonstration projects.
4. Technology development projects in related areas (vessel traffic management, telematics, shipbuilding, ship design, cargo handling, etc).
5. Policy studies.
6. Regulatory studies.
7. Any related publication.
8. Other

### 2.1 Sources of information

Sources of information for this survey have been the following:

#### 1) Proceedings of European Research Roundtable Conferences on Shortsea Shipping

Since 1992, these biennial conferences have been the main scientific forum for dissemination of SSS-related research results. All papers presented at these conferences (1992, 1994, and 1996) have been catalogued.

#### 2) Proceedings of International Conferences on Fast Sea Transportation (FAST)

Since 1991, these biennial conferences have been the main forum on all aspects of fast waterborne transport. By contrast to the SSS conferences (which are European in focus and have a roundtable format), the FAST conference have a worldwide scope and have the traditional parallel session format. This is perhaps the reason that the three FAST conferences to date number close to 300 papers. However, not all of these papers have been catalogued here, since many (in fact most) approach the subject from specific engineering disciplines such as computational fluid dynamics, structural analysis, etc. Although all of these papers have merit, we felt it would serve no meaningful purpose to include them in our survey (in fact, doing so could very well shift the focus away from important issues in SSS). By exercising some judgment, we have identified a number of papers that can be considered to fall into the SSS mainstream, and we have included these papers into our database.

We note here that even though the above two conferences (European SSS and FAST) were the only two conferences that were specifically targeted as sources for this survey, material in other related conferences has also been included, so long as it was brought to our attention. The main vehicle for doing so has been through the concerted action on shortsea shipping, as described below.

### 3) Concerted action on shortsea shipping

The “Concerted Action on Shortsea Shipping” (task 6.1.2/4) is expected to play an important role in the Commission's Waterborne Transport Research Programme (4th FP). It will do so by setting out the following goals:

- compiling the state of the art in this (broadly defined) area,
- synthesizing all relevant research and other related work,
- monitoring related projects,
- defining relevant pilot projects and demonstrators,
- defining criteria for interoperability and SSS logistical efficiency,
- identifying the key focal points for shortsea shipping future development, and
- providing the widest possible exposure and dissemination of the results of the action.

Representation is open to all EU countries and other countries associated with the research programme (according to the association protocol). As many as 13 meetings are envisaged for the action in the period 1995- 1998. The Technical Secretariat of the action is managed by a 4-partner consortium, with the National Technical University of Athens as Coordinator, and with the Alliance of Maritime Regional Interests in Europe (AMRIE), the Institute of Shipping Economics and Logistics (ISL Bremen) and the WEGEMT Association as partners.

Participants of this concerted action (which has held four meetings since June 1995 and plans to hold a workshop in Bergen immediately after the SSS conference) have provided significant input regarding SSS-related research in their countries.

### 4) Additional sources

The Commission services (DGVII) have provided additional information on related projects. Also, ISL Bremen and WEGEMT have collected additional information related to telematics and ship design aspects. All of this information has been catalogued.

## 2.2 A two-level taxonomy

In classifying all this material, a two-level taxonomy was used, with the first level providing the “indexing format” by which each entry was catalogued, and the second level providing some additional information on each entry.

First level: The indexing format for each entry is [ABCYRXn], where:

ABC are the first three letters of the first author, in case of a published entry, or the first three letters of the organization responsible for the entry if the latter is a project or study (see also index X below);

YR are the last two digits of the year in which the work represented by the entry was finished (for ongoing projects or for entries for which no year is supplied YR is set to 96);

X is an index defining the type of work, and taking on the following values:

- A for a magazine article;
- B for a book or proceedings volume;
- H for a research or pilot project;
- P for a published paper (in a journal or in a conference);
- S for a study;
- and T for a technical report, working paper, or thesis;

and finally n is an index that is present only in case there are two or more entries for which all other indices [ABCYRX] are the same (in which case these entries are distinguished by n=1, n=2, etc).

Examples:

- [AKA91P] Akagi, S., (1991), Synthetic Aspects of Transport Economy and Transport Vehicle Performance with Reference to High Speed Marine Vehicles. Vol1, pp 277-292, Proc. FAST'91 Conference, Trondheim, Norway.
- [AHL95S] Ahlers Lines International and Delta Consultancy (1995), Pilot Project: Specialised Shortsea Transport System Feasibility Study: Ro-Ro Services Leixões (Portugal) - Zeebrugge (Belgium). Final Report to the Commission of European Communities, Directorate General for Transport.

It should be realized of course that there might be more than one entry catalogued for a specific piece of work: for instance, one for the project under which the work was done (research project or study), and one or more for publications related to this project. At the same time, not all entries referring to each and every piece of work have been received (or catalogued). Also, the way a specific entry could be classified is not necessarily unique (for instance a research project could be classified as a study, or as a report). We followed the designations submitted to us by the contributors of the material, or in their absence, our own judgment.

The indexing scheme described above is the basis of the bibliographical section (6) of this paper. It is also used in the database management software developed (see section 4).

Second level: This level provides additional information on the entries submitted by the concerted action participants, although it can be extended to all other entries eventually. It is also one of the main features of the database software. The scheme provides a matrix representation of each entry, with rows indicating methodological disciplines, and columns indicating SSS objects under study. One or more boxes that apply can be checked, and the designation of "other" is clarified as appropriate:

	Ships	Other technology	Ports	Networks	Other
Engineering					
Economics/ logistics					
Business/ management					
Regulatory/ policy					
Other					

Due to space limitations, it was impossible to reproduce in this paper the matrices of the material received. However, this information is included in the database software, and we attempt to give an overview of some parts of it in the section that follows.

### 3. Overview of collected material

As of may 10, 1996, the general tally from the collected material is as follows.

Source	Number of entries
SSS and FAST conferences	147
Concerted action participants (by country)	176
Commission projects	29
Additional input from WEGEMT (by country)	90
<b>TOTAL ENTRIES</b>	<b>442</b>

All collected material is listed in Section 6. Here we attempt to *highlight* some important features of this material, realizing that presenting a *detailed* analysis of such a large number of entries is an impossible task (suffice it to realize that presenting the matrix representation of the entries collected would entail increasing the size of this paper to more than 200 pages!). Equally difficult is any attempt to sort out the forest from the trees, identify trends, methodological gaps, or possible research overlaps within this vast collection. Therefore we stress that the material of this section is, by necessity, imperfect.

### 3.1 SSS and FAST conferences

We have little to add to the results of the two previous European Roundtable SSS conferences (references [WIJ93B] and [WIJ95B]), and, a fortiori, to the results of the current one. Collectively, about 80 papers have been presented, spanning the entire spectrum of SSS related topics. Reference [PEE94P] does a good job of reviewing the previous two conferences from the perspective of a European SSS policy. The active participation of the European Commission (DGVII) and the mix of maritime researchers and maritime policy makers in these events contributed to a sharp focus on relevance of research as regards actual implementation of technologies, practices and policies.

The material of the three FAST conferences is far more extensive. In spite of (or maybe because of) a rather specific focus on the object of study (the fast ship), the perspective of these conferences has not been very helpful in sorting out the strategic ramifications of these technologies, both in general terms, and as regards shortsea shipping in particular. The (about 70) references we selected for inclusion in this survey are representative of papers that are (in our judgment) mostly SSS-related. Many of them are from outside Europe. In fact, it is interesting to note that the Yokohama conference (FAST'93) contributed about 30 of these papers, which is more than its expected share. Whether this difference is “statistically significant” or whether it is due to a different attitude of non-Europeans on the subject of fast ships is subject to speculation.

### 3.2 Input from concerted action participating countries

The contributions of the fourteen (14) countries participating in the concerted action merit some more extensive discussion. These are all EU member states except Luxembourg and Austria, plus Norway<sup>1</sup>. A first feature of the collected material has been its volume. At the time of the writing of this paper, 176 entries had been received, not counting some entries that had to be suppressed (for reasons see below).

A second feature of the material was lack of complete homogeneity. In spite of a standardized solicitation for input, the following have been observed:

- Some countries submitted many more entries than others.
- Some countries provided detailed information on their entries, whereas others provided much fewer details.
- Some countries submitted entries in their own language (other than English). Such entries have been temporarily suppressed from our database (and will remain so until an English translation can be obtained).
- Some countries submitted as entries mostly studies or projects, others submitted mostly publications, and others submitted a mix.

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<sup>1</sup> The UK joined the concerted action in the spring of 1996 and no “official” contribution from it has been received. However, the UK section is not empty, representing input submitted by WEGEMT (see section 6.7.10).

- Finally, some countries submitted some entries that fall on the periphery of SSS, addressing detailed technical problems, such as ship resistance, seakeeping, etc. These entries are similar to some of the entries of the FAST conferences that we decided to suppress. However, and by contrast to conference material, we decided not to suppress *on the basis of subject* any of the entries submitted by individual countries. All of these entries are part of our database.

Other than feedback to the contributors for clarifications (eg “please translate” or “please provide this again in the appropriate format”), it has been outside the scope of our own work to fill out possible gaps of information that exist in the submissions, extensively reformat them, translate them, or generally undertake a deeper search of information about the material. A reasonable assumption has been that ensuring an appropriate representation of a country within the European state of the art in SSS research falls within the responsibility of the nominated representatives of that country.

With these clarifications, the following can be said *very briefly* about the country-by-country submissions:

#### Belgium

Most Belgian submissions are in the economics, logistics and policy areas, and mainly study ships, cargoes, and ports. Among them, we highlight a study of the connection between Zeebrugge and Leixões (Portugal) by [AHL95S], a research project on cargo tracing [WES95H], and some policy studies on ports [POL96S] and logistics [POL95S].

#### Denmark

A list of published reports on shipping was submitted by Denmark, mainly covering topics such as deregulation [DER95T] and transport policy [TRA93T, DTP93T, EUT93T]. A report on the future of the coaster [FUT91T] is also included.

#### Finland

Some papers on ship resistance [LAH91P, HAN95P] and seakeeping [KAR95P] are identified. There are also many entries on economics and logistics [VAI90H, VAI94T, VAI92T], and several entries on innovative ship designs [NII91P, NII94P]. Some papers that are included in FAST conference entries [LEV92P, LEV93P] are not included in this list.

#### France

France submitted a general discussion paper on a new approach to SSS [FRA95T], and two proposed studies/projects, one on the concept of Sea/River Road [SRR95S](an extension of the all-Road and Sea/Road transport), and another on the impact of time delays due to road congestion and restrictions [ITD95T]. The main view in these documents seems to be that inland waterway shipping should be promoted as a means to alleviate congestion and aid SSS. Some entries on the “Arc Atlantique” project have also been submitted.

#### Germany

Entries refer to the SUMO study (scenario investigation of maritime transport systems in the Baltic) [ATL94P], and to some economics/logistics studies related to SSS [ZAC91S, HAD95S, KRA95S]. A large number of entries submitted in German (computerized list from Ministry of Transport) were suppressed as it was impossible to obtain a translation in spite of several solicitations to that effect.

#### Greece

As expected, studies or projects on Greece’s coastal system [IMP95S, PRA95S, DRO93S, NTU94S, PSA94A] are predominant. Some of this work, including a modal split analysis for 2004, the year of cabotage deregulation, has been presented at the SSS conferences (and is not repeated in this list). Also studied heavily is the connection with Italy [COM94H, TRA93S, SCH95T].

#### Ireland

Ireland’s submissions are diverse, spanning areas that include unitized cargoes [TRA94S], ship design [TRA95H, KEN92T], vessel traffic services [RVT95S], casualty database [TRA95H2], passenger transport [COL91S], and ports [COL91H].

### Italy

Two large-scale “umbrella” projects stand out in Italy’s list. The first is a multi-year national project on transport, all modes included [BIA92H]. The second is BRITE-EURAM’s “Targeted Research Action” on new ship concepts in shortsea shipping, also known as TRA-NESS, which is coordinated by Italy [TAR95H]. It consists of several multinational projects spanning a spectrum of advanced engineering problems related to fast surface-effect ships/SES.

### Netherlands

The spectrum of projects considered is very broad, covering subjects such as intermodal transport [SSS93S1], feeders [DGS93S, ROT91H], shift of cargo from road to sea [HOO91H, DGS90H], ports [BUC94T1], policy issues [BAG94T], and telematics [DGS95T1, T2, T3].

### Norway

These include a multiyear national programme on SSS [MAR98H], programmes on fast marine vehicles and ships of the future [MAR97H, KVA96H], a programme on “green” ships [DNV94H], and an umbrella programme on maritime information technology (the so-called MiTS system) [MAR93H]. Some entries in the economics and logistics area were also submitted ([NOR95P, STR94P, WER95T], among others).

### Portugal

Transport between Leixões and Zeebrugge [POR93H], and between mainland Portugal and the Azores [MAU91S, CAR92S1,S2] are included in the Portuguese list. Some port navigation systems are also listed [GAM95S, IHN95H].

### Spain

Of particular emphasis are studies on maritime cabotage [PEE93S, CAR92S, MER94S, CON93S1], and ports [CON93S3, GOM95P]. Some “engineering” entries have been also submitted, on topics such as ship design [SIE95P, SIE93P, MOR93P] and (interestingly enough) propeller performance [PIR94P1, ZAT92A].

### Sweden

Innovative loading and intermodal systems [WIJ94S, LUM93S, SJO90S2], feasibility studies [SJO93S], and general SSS studies [ALE94H, SJO95H] are highlighted.

## 3.3 European Commission projects

The projects catalogued fall into 4 categories: DGVII 4th FP projects, DGVII studies (sponsored by Directorate D and generally dealing with policy issues), DGXIII (telematics) 4th FP projects, and DGXII (BRITE-EURAM) projects. The 29 entries included here span a diverse spectrum, from “hard-core” engineering research all the way to “policy/regulatory” studies.

It is interesting to note that projects examining problems that appear, at least at first glance, very similar, have been launched *in parallel* in different DG’s (some port projects in DGVII and DGXIII are examples). The official position of the Commission is that such projects are *complementary*, with each Directorate General looking at a problem from its own perspective (for instance, the DGXIII mostly focusing on the telematics infrastructure of a port, whereas the DGVII is mostly focusing on policy implications).

However, it is still not clear to what extent this will be followed strictly, or what overlaps may exist within such projects. Most of these projects are just under way in the context of the 4th FP, so it is still early to make an assessment of them. The concerted action on SSS will monitor these projects and try to identify overlaps, gaps, or other synergies among these projects.

## 3.4 Input from WEGEMT

WEGEMT, one of the 4 partners of the consortium managing the concerted action on SSS, submitted an impressive collection of material, broken down by country, on projects and publications focusing on the engineering side of SSS. All of this material has been catalogued, and in a sense should be viewed as complementary to the material of section 3. 2. However, a word of caution is necessary. It is our opinion that some of these entries are outside the *mainstream* of SSS, addressing detailed technical problems, such as ship resistance, seakeeping, hydrodynamics, ship structural analysis, etc. This is particularly true for

entries submitted by Italy and the UK. Still, as some of the other entries (eg, those of Germany) fall clearly within the realm of SSS, following our policy to avoid suppressing material directly supplied, we included all entries in this paper for the sake of completeness. Finally, it is interesting to note that all of Norway's WEGEMT entries are covered in the list submitted by Norway's representatives in the concerted action.

#### 4. Software model

As soon as this extensive material started coming in, we quickly realized that there was a need to find an easy way to handle all this available information. The creation of an integrated dBase program became indispensable, in order to enter, update, and retrieve easily the collected data and extract statistics and reports fast and securely.

It was not an easy task to choose the most suitable package among all the available in the software market. We decided that the package should fulfill the following criteria:

- compatibility with as many as possible other software packages, and capability of data interchange among several software environments;
- friendly and smart interface between the user and the machine;
- capability of upgrade from time to time, so all this information can be useful in the future.

Based on the above, we decided to use Microsoft's FoxPro v2.6™ because of previous experience with this package and FoxPro's ability to provide communication with all major operating environments: Windows, DOS, UNIX and Macintosh. The database is formatted and constructed in a way that allows the user to import data of another format and retrieve it via its own interfaces. It is a usual practice to input data with a "drag and drop" way.

A typical screen is shown in Fig. 1. It contains buttons which allow the user to enter, preview, and edit data, and print ready-to-use reports. There is an effort underway to create popup menus so there will be less buttons in the screen and also an effort to create new queries and report types.

**Figure 1: Typical user interface screen**

**Data Input & Retrieving Interface**

Code: DRO93S    Country: Greece    Firm: MOT

Title: Strategic Transport Plan - Greece 2010

Sponsor: NCR    Type: Study    Date: 01/01/93

Status: F    Language:

Authors: DROMOS

	Ships	Cargo	Ports	Networks	Telematics
Engineering	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Economics/Logistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business/Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Regulatory/Policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environment/Safety	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Description:**

This study dealt with the development of a transport strategic plan for Greece for the year 2010. Among the topics examined, sea transport and port development were included mostly from an infrastructure

Top    Prev    Next    Bottom    Find    Print    Add    Edit    Delete    Exit

#### 5. Concluding remarks

This paper described an effort to compile and classify material related to shortsea shipping research. A two level taxonomy and a software model were developed, with the purpose to facilitate information entry, update, retrieval, and search. We believe that this scheme can form the infrastructure for a permanent update of knowledge on the status of research activity in this area. It can also form the baseline for further research, by helping identify what has been done, what gaps exist, and what possible overlaps can be avoided. Last but not least, it can facilitate the critical activity of dissemination of research results, a process that is recognized to be far less perfect than desirable.

Toward that end, we believe that the taxonomy developed in this paper, as well as the observations made in it, can be useful to a number of players in the field, such as:

- the SSS and waterborne transport research community;
- the waterborne transport industry;
- maritime policy makers;
- national R&D agencies;
- the European Commission.

Venturing a first observation from the material collected, it is fair to say that research in this area has been growing at a very strong rate, at least within the last 6 years or so. It is interesting to note that most of the research being done is still at the national level. However, an important trend seems to be taking place: this is the inclusion of SSS-related research into European Commission R&D programmes (mainly that of the DGVII, but also those of the DGXII and DGXIII). This trend is only recent, and mainly concerns the 4th Framework Programme. It is undoubtedly a reflection of the priority the Commission attaches to SSS, as a tool for the development of the Common Transport Policy. It is clear that events such as the Roundtable Conferences have played a key role in identifying the need for more research in this area.

Some related European Commission initiatives, such as the “Task Forces” on topics such as “Transport Intermodality” and “Maritime Systems of the Future” are expected to further add to the momentum in this area.

Since most of these activities are just starting, it is too early to make an assessment of their potential impact on real world SSS technology, practice, and policy. However, one of their *potential* contributions is worthy of discussion.

Looking at the material collected, one can observe that, with few exceptions, a significant degree of *fragmentation* exists, and this is essentially across country lines. As one example (and there can be many others), topics such as cabotage that have been studied mostly in Spain and Greece have been studied essentially in isolation, even though it is clear that much in common exists. The same can be said about other topics, such as ports. Lack of aggressive dissemination of research results, or of common fora in which such results are presented are the main causes for such a state of affairs. Although such fora do exist, clearly more can and should be done, *particularly at the end-user level*, which where the greatest degree of fragmentation exists.

The most obvious consequence of this fragmentation is that the impact of R&D efforts to serve the real needs of European SSS has been so far limited. There is certainly significant room for improvement in that regard, but as long as this fragmentation continues, the potential impact will likely continue to be low and diluted.

It is precisely one of the roles of collaborative R&D efforts such as those sponsored by the European Commission to help alleviate this situation. These collaborative projects are expected to reduce the risk of further fragmentation, by bringing together partners from several countries and by cross-fertilizing ideas both from the research end and from the maritime industry end.

An implicit assumption is of course that fragmentation does not spread to the EU projects too. In our opinion, a risk that is clearly present is that each Directorate General of the Commission that deals with Transport Research proceeds independently of what the others are doing. As at this point in time there are several DG's dealing with Transport Research, either directly, or indirectly (DGVII, DGXII, DGXIII,

DGIII, among others), there is a clear need for internal Commission coordination of such R&D activities.

Although from an SSS researcher's viewpoint the funds allocated to SSS (as a percentage of the Commission's total transport R&D budget) can still be considered low, the fact that such funds practically did not exist a few years ago is certainly encouraging. Activities such as the Roundtable Conferences, the Concerted Action on SSS, and others, are expected to further maintain the focus on this important topic, so that SSS obtains a share equivalent to its overall importance in European transport.<sup>2</sup>

## 6. Bibliography

The bibliographical section is organized in the following way:

- 6.1 Conferences
- 6.2 Input from concerted action participating countries
- 6.3 DGVII 4th FP projects
- 6.4 DGVII/D studies
- 6.5 Telematics projects
- 6.6 BRITE-EURAM projects
- 6.7 Other input from WEGEMT (listed by country)

### 6.1 Conferences

Catalogued below are all papers from the European Research Roundtable Conferences on Shorsea Shipping (1992, 1994, and 1996<sup>3</sup>) and SSS-related papers from the FAST conferences (1991, 1993, and 1995).

Further to the indexing scheme [ABCYRXn] defined earlier, the following acronyms are used:

ESSS'92: First European Research Roundtable Conference on Shortsea Shipping, Delft, The Netherlands, 1992.

ESSS'94: Second European Research Roundtable Conference on Shortsea Shipping, Athens (Vouliagmeni), Greece, 1994.

ESSS'96: Third European Research Roundtable Conference on Shortsea Shipping (Shortsea'96), Bergen, Norway, 1996.

FAST'91: First International Conference on Fast Sea Transportation, Trondheim, Norway, 1991.

FAST'93: Second International Conference on Fast Sea Transportation, Yokohama, Japan, 1993.

FAST'95: Third International Conference on Fast Sea Transportation, Lubeck-Travemunde, Germany, 1995.

- [AKA91P] Akagi, S., (1991) Synthetic Aspects of Transport Economy and Transport Vehicle Performance with Reference to High Speed Marine Vehicles. Vol1, pp 277-292, Proc. FAST'91.
- [AKA93P1] Akagi, S., (1993) A Study of Transport Economy and Market Research for High Speed Marine Passenger Vehicles. Vol2, pp 1129-1142, Proc. FAST'93.
- [AKA93P2] Akashi, K., (1993) Flyable Hydrofoil Catamaran (FHC)- A New Seaplane Concept, Vol2, pp 1423-1432, Proc. FAST'93.
- [ARE93P] Arena, G., L.De Martini (1993) Operational and Cost Analysis of Ficantieri's Fast Ferries. Vol2, pp 1117-1128, Proc. FAST'93.

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<sup>3</sup> Included are all papers as listed in the *preliminary* programme of the conference. Revisions of the programme after May 10, 1996 are not included.

- [ARE93P] Arena, G., V. Farinetti (1993) Introducing Eurofast. Vol2, pp 1179-1192, Proc. FAST'93.
- [ARI93P] Arie, T., H. Miyata, H. Kawaguchi, K. Hatta, (1993) Development of a Foil-Assisted Catamaran "Superjet-30". Vol1, pp 295-304, Proc. FAST'93.
- [BAG92P] Bagchus, R.C., B. Kuipers (1992) Autostrade Del Mare. pp 52-65, Proc. ESSS'92.
- [BAI96P] Baird, A., (1996) The Marine Motorway: Opportunities for coastal freight ferry services in the United Kingdom. Proc. ESSS'96.
- [BER95P] Bertram, V., H.J. Schmidt, J. Marzi (1995) Hybrid Hydrofoil Monohulls. Vol1, pp 575-586, Proc. FAST'95.
- [BLO93P] Blount, D.L., (1993) Prospects for Hard Chine, Monohull Vessels. Vol2, pp 1641-1656, Proc. FAST'93.
- [BRE92P] Breitzmann, K.H., (1992) Ferry Transport in the Southern Baltic Sea and its Prospects. pp 279-288, Proc. ESSS'92.
- [BOG93P] Bogdanov, A.I., D.N. Synitsin (1993) New IMO High Speed Craft Code and the Problems of Ekranoplane's Certification. Vol2, pp 1457-1464, Proc. FAST'93.
- [BOO95P] Boote, D., M. Ragone, A. Sculati (1995) Seaworthiness of Aquastrada Class of Ships. Vol1, pp 165-178, Proc. FAST'95.
- [CAS92P] Caspers, F.N., R. ter Brugge (1992) Logistic Requirements and Shortsea Shipping. pp 40-51, Proc. ESSS'92.
- [CHE92P] Cheetham, C., P. Hornby, R. Papenhuijzen (1992) Recent Developments in Feeder Transport by Coasters. pp 364-378, Proc. ESSS'92.
- [CHL96P] Chlomoudis, C., A. Pallis (1996) Investment policies in ports' infrastructure in the perspective of the European Shortsea Shipping Networks: The case of Greece. Proc. ESSS'96.
- [CHU91P] Chubikov, V., V. Pashin, V. Treshchevsky, A. Maskalik (1991) EKRANOPLAN: A High-Speed Marine Vehicle of a New Type. Vol1, pp 641-648, Proc. FAST'91.
- [CIO96P] Ciortan, R., (1996) Perspective of short sea navigation in the Black Sea basin. Proc. ESSS'96.
- [CLI94P] Clinckers, L., E. Declercq, C. Peeters, A. Verbeke (1994) Water-Based Multimodal Terminals: an Eclectic Site Evaluation Model. pp 245-268, Proc. ESSS'94.
- [COO92P] Cooper, D.H., N.E. Denman, F.D.R. Yell (1992) Hydraulic Research Studies Increase Efficiency at North Sea Ports. pp 140-173, Proc. ESSS'92.
- [COR91P] Cordano, A., L. De Martini (1991) SES 500 - Fincantieri - Design Criteria. Vol1, pp 179-198, Proc. FAST'91.
- [CRI92P] Crilley, J., C.J. Dean (1992) Shortsea Shipping and the World Cargo Carrying Fleet - A Statistical Summary. pp 1-21, Proc. ESSS'92.
- [CZI91P] Czimmek, D.W., B.H. Schaub (1991) Concept of a Large Surface Effect Ship for Fast Ocean Transport. Vol1, pp 91-106, Proc. FAST'91.
- [DEM94P] deMeester, Th. H., (1994) Maritime Research Priorities for Europe. pp 512-522, Proc. ESSS'94.
- [DEV92P] deVos, H., (1992) Information System for Improving Market Activities in the Shortsea Trade. pp 95-106, Proc. ESSS'92.
- [DEW92P] deWulf, B., H. Meersman, E. van de Voorde (1992) The Demand for Sea Transport in Smaller Sea Ports: An Application to the Port of Brussels. pp 333-345, Proc. ESSS'92.
- [DIB92P] Dibner, B., (1992) Shortsea Shipping in Europe and the Americas: Status and Prospects. pp 289-300, Proc. ESSS'92.
- [DOB94P] Dobler, J.P., (1994) Growth Prospects of High-Speed Car-Ferries Utilization on European Shortsea Routes. pp 269-293, Proc. ESSS'94.
- [EVE94P] Everard, F.M., C.P. Boyle (1994) The Single Market and the Removal of Obstacles to the Greater Use of Shortsea Shipping. pp 350-356, Proc. ESSS'94.
- [EVE96P] Evers, J., Container Terminal of the Future. Proc. ESSS'96.
- [FOR94P] Forster, W., B. Zigic, W. Simon (1994) Prerequisites for Improvements of the Shipping in South-East European Regions. pp 79-96, Proc. ESSS'94.
- [FOS91P] Foss, B., (1991) Economy and Speed in Commercial Operations. Vol1, pp 259-276, Proc. FAST'91.
- [FRA94P] Frankel, E.G., (1994) Integrated Tug-Barge Systems for Shortsea Shipping in Europe. pp 402-413, Proc. ESSS'94.

- [FUW93P] Fuwa, T., N. Hirata, J. Hasegawa, T. Hori (1993) Fundamental Study on Safety Evaluation of Wing-In-Surface Effect Ship (WISES). Vol2, pp 1585-1596, Proc. FAST'93.
- [GAL95P] Gallin, C.M., J.H. Phipps, J. Stevenson, T. van Terwisga (1995) Technically and Economically Optimised Fast Ships Propulsion Systems from 18000 to 30000 kW. Vol2, pp 725-754, Proc. FAST'95.
- [GAR92P] Garratt, M., S. Carston, C.G. Rabbitts, N.A. Theophilopoulos (1992) History of Community Networks in the United Kingdom. pp 174-183, Proc. ESSS'92.
- [GAR96P] Garratt, M., (1996) Potential for network development in shortsea shipping. Proc. ESSS'96.
- [GEE91P] Gee, N., (1991) The Catafoil - A Foil Assisted Catamaran for Fast Ferry and Yacht Applications. pp 107-124, Proc. FAST'91.
- [GEE93P] Gee, N.I., E. Dudson (1993) Fast Sea Transportation - The Effect of Present and Future Technical Developments on Operating Economics. Vol2, pp 1155-1166, Proc. FAST'93.
- [GRO95P] Grosjean, P., J.L.J. Marchal, S. Rodriguez (1995) Optimum Design of a High Speed Ferry-Passengers Catamaran Vessel taking into account Operational Criteria and Cost. Vol1, pp 441-452, Proc. FAST'95.
- [GOU92P] Goulielmos, A.M., M. Lekakos (1992) The Economic Structure of Greek Passenger Coastal Shipping. pp 301-315, Proc. ESSS'92.
- [GOU94P] Goulielmos, A.M., M. Milliaraki (1994) The Economic and Social Impact on Greek Passenger Coastal Shipping of the Free Movement of Marine Labour in European Union. pp 414-432, Proc. ESSS'94.
- [GOU96P] Goulielmos, A., The role of Greek shipping and ports in the Greek-Italian shortsea network. Proc. ESSS'96.
- [GRO92P] Groenvelde, R., M. Adler (1992) A New Inland Transport System for Containers between Rotterdam and Antwerp. pp 125-139, Proc. ESSS'92.
- [GUE93P] Guezou, J.-P., (1993) Agnes 200: Up-to-date Technical Information and Potential Use for Commercial and Military Applications. Vol1, pp 21-34, Proc. FAST'93.
- [GUN92P1] Gunsteren, L.A.van., T. van Popta, R.E.G. Ravenhorst (1992) Is Continental and Inter-Continental Cargo Waiting for Shortsea Shipping? pp 245-256, Proc. ESSS'92.
- [GUN92P2] Gunsteren, L.A.van., (1992) Diffusion of Innovations in Coastal Shipping. pp 257-265, Proc. ESSS'92.
- [HAN96P] Hansen, B., (1996) "CPT-Container Pallet Transfer" - an automatic high capacity ship/shore loading system. Proc. ESSS'96.
- [HAG93P] Hagman, T.E.W., K.R. Lumsden (1993) Fast Sea Transportation System in the Aspect of Logistics. Vol2, pp 1143-1154, Proc. FAST'93.
- [HAL93P] Halleen, R.M., J.H. Phipps, J.R. Gladden (1993) Fast Vessel Engines-Environmentally Superior Power for Highly Reliable Transportation. Vol2, pp 1049-1064, Proc. FAST'93.
- [HAR91P] Hara, K., (1991) Safety of Collision Avoidance Maneuver Under High Speed Navigation. Vol2, pp 1077-1092, Proc. FAST'91.
- [HEI92P] Heijveld, H., R. Gray (1992) U.K. Shortsea Ferry Services, a Baseline Model Approach for Policy Decision Making. pp 211-232, Proc. ESSS'92.
- [HEI96P] Heimdal, S., R. Gray (1996) Improving Short Sea Bulk Operations. Proc. ESSS'96.
- [HEI94P] Heirung, E., (1994) Are Roro Ferries Subsidizing Lolos? pp 327-334, Proc. ESSS'94.
- [HEL91P] Helmersen, H., P. Werenskiod (1991) Safety of Fast Sea Transport. Vol2, pp 1297-1348, Proc. FAST'91.
- [HER93P] Hercus, P.C., (1993) Fast Sea Transportation in the 21st Century. Vol2, Proc. FAST'93.
- [HIM96P] Himanen, V., E. Mahlin, W. Segercrantz (1996) Cooperation and Development of Ports in Eastern Baltic Shipping. Proc. ESSS'96.
- [HOL95P] Holcomb, R.S. (1995) Swath International's Super 4000 Class - Its Design, Construction and Performance. Vol2, pp 643-654, Proc. FAST'95.
- [HOO92P] Hoogerbeets, J., P. Melissen (1992) Facilitation of Shortsea Shipping: Improvement in the Sea/Land Interface (the Dutch Case). pp 346-350, Proc. ESSS'92.
- [HU 91P] Hu, L., (1991) Design, Trial and Operation of "Hong Xiang" SES Ferry. Vol1, pp 529-540, Proc. FAST'91.
- [IGI94P] Igielska, J., (1994) An Alternative System for Shortsea Shipment of Road Vehicles. pp 176-194, Proc. ESSS'94.

- [IGI96P] Igielska, J., (1996) An impact of logistics on ships' technical performances. Proc. ESSS'96.
- [IMA95P] Imazu, H. (1995) The Effect of Ship's Speed on Collision Avoidance. Vol1, pp 393-404, Proc. FAST'95.
- [INS91P] Instanes, E., J.T. Pedersen (1991) Safe and Comfortable Operation of Foilcatamarans. Vol2, pp 1093-1112, Proc. FAST'91.
- [JOO93P] Joo, Y.R., K.Y. Nho, H.S. Jang, Y.K. Choi, D.R. Lavis, B.G. Forstell (1993) Parametric Design Trade-Off Study and Preliminary Design of an SES Passenger Car Ferry. Vol2, pp 1531-1542, Proc. FAST'93.
- [JOO95P] Joo, Y.R., H.S. Jang, S.D. Park, J.H. Park, G.G. Filipchenko, I. Baskakov (1995) Development of a 1200 DWT High-Speed Container Ship. Vol1, pp 453-462, Proc. FAST'95.
- [JUL93P] Jullmstro, E., J. Leppanen, J. Sirvio (1993) Performance and Behaviour of the Large Slender Monohull. Vol2, pp 1477-1488, Proc. FAST'93.
- [KAM95P] Kamoi, N., Y. Saito, S. Nishimura, S. Miyamoto, K. Kawajiri (1995) Wave-Piercing Catamaran Type High-Speed Car Ferry "HAYABUSA". Vol1, pp 429-440, Proc. FAST'95.
- [KEL94P] Kelchtermans, T., (1994) Introduction to the Corridor Study. pp 450-452, Proc. ESSS'94.
- [KIH93P] Kihara, K., C. Hamada, M.Miyoshi, H. Sueoka, T. Kawakami, T. Harada, N.Toki (1993) Diesel Driven Fully Submerged Hydrofoil Catamaran: Mitsubishi Super-Shuttle 400 "RAINBOW". Vol1, pp 139-150, Proc. FAST'93.
- [KON92P] Kondratowicz, L., (1992) Generating Logistical Chains Scenarios for Maritime Policymakers. pp 379-402, Proc. ESSS'92.
- [KOY91P] Koyama, T., (1991) A State of the Arts of Fast Sea Transportation in Japan. Vol1, pp 309-316, Proc. FAST'91.
- [KRA91P] Kraus, A., A. Naujeck (1991) Comparison of a Cargo Catamaran with Conventional Seaborne and Airborne Transportation. Vol1, pp 293-308, Proc. FAST'91.
- [KRA93P] Kraus, A., A. Naujeck (1993) "SUS-A"-The State of the Art of the German Research Program for Fast Catamarans. Vol1, pp 213-222, Proc. FAST'93.
- [KUB93P] Kubo, S., (1993) A Concept of Wing-In-Surface-Effect Craft as a Future Passenger Transport in Japan. Vol2, pp 1573-1584, Proc. FAST'93.
- [LAN95P] Langenberg, H. (1995) Fast Displacement Ships - An Economical Option for High Speed Transportation. Vol1, pp 283-294, Proc. FAST'95.
- [LEV92P] Levander, K., (1992) The Potential for Fast Ships in European Freight Transport. pp 22-39, Proc. ESSS'92.
- [LEV93P] Levander, K., (1993) Fast Slender Monohull Vessels for Cargo Transport. Vol2, pp 1283-1294, Proc. FAST'93.
- [LIN92P] Linde, H., (1992) Status and Perspectives of Technological Development in European Shortsea Shipping. pp 107-124, Proc. ESSS'92.
- [LUN93P] Lundgren, J., (1993) High-Speed Monohulls in Extreme Sea Conditions. A Study of Operational Limits. Vol2, pp 1393-1408, Proc. FAST'93.
- [MAE94P] Maertens, L., (1994) Competiveness of Shortsea Shipping Ports: The Case of Zeebrugge. pp 439-449, Proc. ESSS'94.
- [MAK93P] Makela, K., K. Riska (1993) The Limits of Speed Displacement, Catamaran and SWATH Vessels\*. Vol2, Proc. FAST'93.
- [MAR94P] Marchal, J.L.J., (1994) Shortsea Shipping from Hinterland Ports by Sea-River Going Vessels: Study of the Influence of a Free Cabotage Policy. pp 154-175, Proc. ESSS'94.
- [MAR96P] Marchal, J., Z. Zhang (1996) A new model for optimal sea-river shipping management. Proc. ESSS'96.
- [MRT94P] Martens, R.J., (1994) Shortsea Shipping: Via Optima? pp 230-244, Proc. ESSS'94.
- [MCG91P] McGregor, R.C., H.H. Chun (1991) On the Potential of SWATH Ships for Very High Speed Operations. Vol1, pp 491-506, Proc. FAST'91.
- [MIN91P] Min, K.S., (1991) Long-Range High-Speed Catamaran Passenger Ship Design. Vol1, pp 591-606, Proc. FAST'91.
- [MIN95P] Min, K.-S, Y.-W. Lee (1995) Design of A High-Speed 300 Passenger SWATH Ship. Vol2, pp 655-666, Proc. FAST'95.
- [MOR93P] Morlan, C., (1993) Development of the ABS Guide for Building and Classing High Speed Craft. Vol1, pp 907-916, Proc. FAST'93.

- [NAG93P] Nagasawa, A., K. Hara, S. Nakamura, Y. Onda (1993) Assessment of High Speed Navigation in a Congested Area by the Traffic Simulation. Vol2, pp 1349-1358, Proc. FAST'93.
- [NAK91P] Nakato, M., O. Matsumoto, Y. Osawa, H. Nobukawa, M. Nisioka, M. Tamashima (1991) Feasibility Study on a High-Speed Hydrofoil Catamaran of Lesser Pitching. Vol2, pp 931-948, Proc. FAST'91.
- [NIT93P] Nitz, A., H. Muxfeldt (1993) "SUS-B"-First Results of the German Research Project for SWATH-Ships-Conceptual Design of a 90m SWATH. Vol1, pp 239-252, Proc. FAST'93.
- [NUM93P] Numano, M., K. Miyazaki, J. Fukuto, N. Haraki (1993) Safety Assessment of Advanced Marine Transportation System Including High Speed Vessels with Safety Margin as an Index. Vol2, pp 1359-1368, Proc. FAST'93.
- [OGA91P] Ogawa, K., (1991) Some Conciderations on Rules and Regulations for Fast Sea Transportation in Japan. Vol2, pp 1293-1296, Proc. FAST'91.
- [OGI93P] Ogiwara R., N. Yamanaka, K. Kobayashi, A. Moriyama (1993) A Submerged Hull and Foil Hybrid Super-High Speed Liner. Vol1, pp 189-200, Proc. FAST'93.
- [OTT91P] Ottosson, P., O. Rutgersson (1991) Computer Programs in the Feasibility Design of New SES-Projects. Vol2, pp 1251-1274, Proc. FAST'91.
- [OZA91P] Ozawa, H., S. Morishita, R. Oimatsu, Y. Kunitake (1991) A Concept Design Study of "Techno-Superliner". Vol1, pp 199-208, Proc. FAST'91.
- [OJA92P] Ojala, L., (1992) The Finnish Liner Shipping Market. pp 233-244, Proc. ESSS'92.
- [OJA94P] Ojala, L., S.Lall, M. Svendsen (1994) Baltic Bulk Shipping in the 1990's: How to Match an ageing Shortsea Fleet with Increasing Demand. pp 115-153, Proc. ESSS'94.
- [OJA96P] Ojala, L., S. Baciauskiene (1996) Maritime policies in the Baltic with special reference to short-sea shipping. Proc. ESSS'96.
- [PAC94P] Packer, J.J.L., (1994) UK Roads to Water Initiative: a Focusing Study. pp 501-511, Proc. ESSS'94.
- [PAL95P] Pal, K.P., L.J. Doctors (1995) Optimal Design of High-Speed River Catamarans. Vol2, pp 1301-1312, Proc. FAST'95.
- [PET95P] Petersen, U., J.P. Securius (1995) Introduction of Systematic and Probabilistic Safety Assessment Methods for the Classification of High Speed Craft. Vol1, pp 115-128, Proc. FAST'95.
- [PAP91P] Papanikolaou, A., M.Androulakis (1991) Hydrodynamic Optimization of High-Speed SWATH. Vol1, pp 507-522, Proc. FAST'91.
- [PAP95P] Papanikolaou, A., N. Bouliaris, C. Koskinas, K. Pigounakis (1995) SMUCC -SWATH Multipurpose Container Carrier. Vol2, pp 667-680, Proc. FAST'95.
- [PAP96P] Papanikolaou, A., D. Vassalos, I. Ostvik (1996) Innovative fast ship designs for an integrated SSS system - IFSISS. Proc. ESSS'96.
- [PAR91P] Parodi, M., L. Grossi (1991) "DESTRIERO": The Realization of a Technological Challenge. Vol1, pp 541-556, Proc. FAST'91.
- [PEE94P] Peeters, C., A. Verbeke, E. Declercq (1994) The Future of European Policies for Shortsea Shipping. pp 453-475, Proc. ESSS'94.
- [PES92P] Pesquera, M.A., L. de la Hoz (1992) EDI, Key for Shortsea Shipping Development: the Arcantel Platform. pp 193-210, Proc. ESSS'92.
- [PIN95P] Pinon, H. (1995) New Rules For High Speed Craft. Vol1, pp 129-136, Proc. FAST'95.
- [PLA93P] Plaza, F., K. Sekimizu (1993) Towards the Adoption of an IMO High Speed Craft Code. Vol1, pp 917-928, Proc. FAST'93.
- [PSA92P] Psaraftis, H.N., A.D. Papanikolaou (1992) Impact of New Technologies on Shortsea Shipping in Greece. pp 79-94, Proc. ESSS'92.
- [PSA94P1] Psaraftis, H.N., V.F. Magirou, G.C. Nassos, G.J. Nellas, G. Panagakos, A.D. Papanikolaou (1994) Modal Split Analysis in Greek Shortsea Passenger/Car Transport. pp 195-229, Proc. ESSS'94.
- [PSA96P] Psaraftis, H., O. Schinas (1996) Research in Shortsea Shipping: the State of the Art. Proc. ESSS'96.
- [RAD95P] Radojcic, D. (1995) Performance Predictions and Parametric Studies for Small High-Speed Displacement and Semidisplacement Vessels with Shallow Draft. Vol1, pp 45-56, Proc. FAST'95.
- [RAY94P] Raymond, T.de, A. Taieb (1994) The Setting-Upof Feeder/Coastal Services, a Solution for the Medium Sized Ports of the Atlantic Arc? pp 53-78, Proc. ESSS'94.

- [SAW92P] Sawiczewska, Z., (1992) The Impact of Political and Economic Change on Polish Shortsea Shipping. pp 351-363, Proc. ESSS'92.
- [SCH96P] Schinas, O., H. Psaraftis (1996) The intermodal link between Greece and the rest of EU countries: Status and prospects. Proc. ESSS'96.
- [SJO92P] Sjöbris, A., (1992) Coastal and Shortsea Shipping in Sweden: a Preliminary Study. pp 328-332, Proc. ESSS'92.
- [SJO94P] Sjöbris, A., N. Wijnolst, C. Peeters (1994) Fast Selfloading and Unloading Unitload Shipsystems for Coastal and Shortsea Shipping: Potential in North-East Europe. pp 433-438, Proc. ESSS'94.
- [SJO96P] Sjöbris, A., (1996) Building European shortsea networks. Proc. ESSS'96.
- [STO94P] Stoop, J.A., (1994) Safety in a Modern Perspective. pp 335-349, Proc. ESSS'94.
- [STO96P] Stoop, J., (1996) Integrating safety into the shortsea shipping system. Proc. ESSS'96.
- [STU94P] Sturmeijer, S.G., G. Panagakos, H.N. Psaraftis (1994) Institutional and Socio-Economic Issues in Greek Ferry Services. pp 476-500, Proc. ESSS'94.
- [SUG91P] Sugai, K., M. Yamaguchi (1991) Research and Development Program of Techno-Superliner. Vol2, pp 671-678, Proc. FAST'91.
- [SUT94P] Sutcliffe, P., M. Garratt (1994) Container Traffic in Europe - Changing Patterns and Policy Options. pp 357-377, Proc. ESSS'94.
- [SVE93P] Svensen, T.E., S. Valsgard (1993) Design Philosophy and Design Procedures for Large High Speed Craft. Vol2, pp 1597-1612, Proc. FAST'93.
- [SVE96P] Svendsen, M., S. Lall (1996) Sealynx - Presentation of a new concept of short sea bulk transport system. Proc. ESSS'96.
- [TAK93P] Takarada, N., J. Obokata, M. Kado, M. Takai, K. Shigematsu (1993) R & D of a Displacement-Type High-Speed Ship (Part 1. A Conceptual Design Study) Vol1, pp 317-328, Proc. FAST'93.
- [TRI91P] Trillo, R.L., (1991) High Speed Over Water, Ideas from the Past, the Present and for the Future. Vol1, pp 17-34, Proc. FAST'91.
- [TRI94P] Trincas, G., C. Closca, R. Nabergoj, J.S. Popovici (1994) Futura - a Fast Ro-Ro Ship for Mediterranean Coastal Trade. pp 294-326, Proc. ESSS'94.
- [TRI95P] Trincas, G., A. Biriaco, I. Grubistic, A. Ponomarev (1995) Feasibility Study on a High-Speed Catamaran: Comparison with Aquastrada. Vol1, pp 319-332, Proc. FAST'95.
- [TRI96P] Trincas, G., R. Nabergoj, E. Curtis, V. Pistola (1996) Forecasting the fleet to serve the South-East European shortsea transport. Proc. ESSS'96.
- [TRU94P] Truau, J., (1994) Metro-Coastal Shipping. pp 97-114, Proc. ESSS'94.
- [VAN96P] Van der Linden, J., S. Veldman, M. van der Flier (1996) Hinterland Transport Management Information System. Proc. ESSS'96.
- [WEL92P] Wells, S.N.A. (1992) Innovation in Multi-Modal Logistics Solutions. pp 66-78, Proc. ESSS'92.
- [WER96P] Wergeland, T., A. Osmundsvaag (1996) Fast ferries in the European shortsea network - the potential and the implications. Proc. ESSS'96.
- [WES95P] Wessel, J. (1995) Review on German SES Developments and the Government funded R+D Programme SUS C. Vol2, pp 917-930, Proc. FAST'95.
- [WIE94P] Wierikx, A.A.C.M., J. van Riet (1994) Strategic Profiles for Transport Companies: The Case for Dutch Forest Product Carriers. pp 378-401, Proc. ESSS'94.
- [WIK93P] Wiklund, K.M., (1993) The Future for High Speed Light Craft. Vol1, pp 101-114, Proc. FAST'93.
- [WIL92P] Willigenburg, J.R.van., S. Hollander (1992) Coastal Shipping, Opportunities in a Changing Market. pp 184-192, Proc. ESSS'92.
- [WRI92P] Wright, C., (1992) Self-Unloading Vessels for Intra-European Bulk Trades. pp 266-278, Proc. ESSS'92.
- [YAM91P] Yamanaka, N., O. Yamamoto, R. Satoh, T. Nagatsuka, T. Arii, T. Fuwa (1991) A Submerged Hull and Foil Hybrid Super-High Speed Liner. Vol1, pp 163-178, Proc. FAST'91.
- [YUN93P] Yun, L., (1993) Prospect of High Performance Marine Vehicles in China in the 21st Century. Vol2, pp 1671-1686, Proc. FAST'93.
- [ZAC92P] Zachcial, M., (1992) Assessment of Land/Sea Feeder Traffic Flows in Europe. pp 316-320, Proc. ESSS'92.
- [ZAC96P] Zachcial, M., (1996) Land/Sea Transport Flows in Europe. Proc. ESSS'96.

- [ZIG96P] Zigic, B., (1996) One new concept for container reloading on inland vessels. Proc. ESSS'96.

## 6.2 Concerted action participating countries

The list of entries, broken down by source, follows (contributors are in parentheses).

### 6.2.1 Belgium (C. Peeters, H. Smitz)

- [AHL95S] Ahlers Lines International and Delta Consultancy (1995), Pilot Project: Specialised Shortsea Transport System Feasibility Study: Ro-Ro Services Leixões (Portugal) - Zeebrugge (Belgium). Final Report to the Commission of European Community, Directorate General for Transport.
- [DEM95T] deMeester H., (1995), Report of the Shortsea Shipping Panel.Fourth Report of the Maritime Industries Forum Shortsea Shipping Panel to the Commission.
- [PEE95T] Peeters, C., A. Verbeke, E. Declercq, (1995), European Shortsea Shipping: Towards the 21st Century, Brief Publication, Policy Research Corporation.
- [PEE95S1] Peeters, C., A. Verbeke, E. Declercq, N. Wijnolst (1995), Analysis of the Competitive Position of Shortsea Shipping: Development of Policy Measures. Study, Policy Research Corporation. Sponsor: CEC DGVII.
- [PEE95S2] Peeters, C., A. Verbeke, E. Declercq,(1995), Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions. Study, Policy Research Corporation. Sponsor: CEC DGVII.
- [POL96S] Policy Research Corporation, (1995), Creation of port pairs for SSS development in Europe. Study. Sponsor: CEC DGVII.
- [POL95S] Policy Research Corporation, (1995), Impact of Changing Logistics on Maritime Transport, Study Sponsor: CEC DGVII.
- [WES95H] Westerlund Corporation, Medior Software, ENSO West Antwerp, Holmen Paper AB, (1995), Cargo Tracing. Research programme.
- [WES95H] Westerlund Corporation (1995), Shortsea Development Project. Research programme.
- [WIJ95S] Wijnolst, N., A. Sjöbris, C. Peeters, A. Verbeke, E. Declercq, T. Schmitter, (1995), Multimodal Shortsea Transport; Coastal Superhighway: an indispensable link in the European transport network (Porthopper Study). Study, University of Antwerp and Brussels, Policy Research Corporation, University of Delft, Maritem AB.

### 6.2.2 Denmark (E. Styhr Petersen)

- [DER95T] Deregulation of the Transport Sector, (1995), The Transport Council's Report 95\*5, July.
- [DTP93T] Danish Transport Policy- A Summary (1993), The Transport Council's Report No. 93\*01, June.
- [EUT93T] EU Transport Policy- A Summary (1993), The Transport Council's Report No. 93\*02, June.
- [FUT91T] A Future for the Coaster (1991), Report from the Coaster Committee- Ministry of Business and Industry, June.
- [IND93T] Industrial Review (1994), The Government's Industrial (Shipping) Policy.
- [IND94T] Industrial Review (1994), The Government's Industrial Policy.
- [MEM95T] Memo on the Potential for Sea Transportation, (1995), Ministry of Transport/ The Transport Council, May.
- [NTP93T] National Traffic Plan- A Presentation of Ideas- The Transport Council's Report No. 93\*3, June.
- [TRA93T] Transport 2005 (1993), Ministry of Transport- New Orientation about the Policy on Transport, December.
- [TRC93T] TransportCommunication-Resource Area Analysis, (1993), October.

### 6.2.3 Finland (J. Vainio, J. Sukselainen)

- [AND94P] Andersson L., (1994), Finland -the logistics centre between East and West, RORO94, Gothenburg.
- [ENV94P] Environmental and safety aspects of marine traffic in the Baltic Sea, (1994), Meeting of Experts on Ports and Marine Transport, Nantali, Finland, November.
- [HAN95P] Hanhiova K. et al (1995), Preliminary Resistance Prediction Method for Fast Mono- and Multi- Hull Vessels, RIVA International Conference on High Speed Passenger Craft, London.
- [HEL95P] Helasharju H. et al, (1995), Resistance and Seakeeping Characteristics of Large and Fast Multihull Vessels, proc. FAST'95.
- [KAN94P] Kanerva, M., (1994), A revolution in RoRo shipping, RORO94, Gothenburg.
- [KAR95P] Karppinen T. et al (1995), The seakeeping performance of fast single and multi hull passenger ferries, Cruise & Ferry 95, London.
- [KAR93P1] Karppinen T. et al, (1993), Passenger comfort and seakeeping performance of fast ferries, RIVA International Conference on High Speed Passenger Craft, London.
- [KAR93P2] Karppinen T. et al, (1993), Design package to maximize passenger comfort, Cruise & Ferry 93, London.
- [LAH91P] Lahtirharju E. et al (1991), Resistance and Seakeeping Characteristics of Fast Transom Stern Hulls with Systematically Varied Forms, SNAME Transactions Vol. 99, New York.
- [MUS94P] Mustamaki E, (1994), FG Shipping's new Baltic Combi RoRos, RORO94, Gothenburg.
- [NII91P] Niini M., (1991), The fourth generation of cruise ferry "Silja Serenade". The realization of its unique concept, with problems, solutions, and service experience. Cruise & Ferry 91, London.
- [NII94P] Niini M., (1994), A new generation of "standard" diesel -electric RoRo ferry, RORO94, Gothenburg.
- [REC89S] Reception of wastes from Ships in the Baltic Sea area (1989), Study, Baltic Sea environment proceedings No. 28, Baltic Marine Environment Protection Commission.
- [VAI90H] Vainio J., (1990), Knowledge Based Methodology for Simulation of Intermodal Transport Terminals, Research, University of Turku, Center for Maritime Studies.
- [VAI93H] Vainio J., (1993), MULTIMOD: the system for Simulation Modelling of Seaports and terminals as logistics centers in Intermodal freight transportsimulation in logistic planning, Research, University of Turku, Center for Maritime Studies.
- [VAI94T] Vainio J., (1994), Peripherality and logistics in the New Europe, Report, Provincial government of Turku and Pori, University of Turku, Center for Maritime Studies.
- [VAI92T] Vainio J., (1992), Integrated transport and logistical developments in Europe, Report, University of Turku, Center for Maritime Studies.
- [VAI94 S] Vainio J., (1994), The northern Sea route. A traffic potential study. University of Turku, Center for Maritime Studies.
- [VAI93T] Vainio J., (1993), Baltic Sea - Mare Nostrum, Symposium Report, University of Turku, Center for Maritime Studies.
- [WIN93H] Winter N. et al, (1993), The Regional Impact of the Free Maritime Transport in the Baltic Sea, Research, the Maritime Foundation, University of Turku/Center for Maritime Studies.

#### 6.2.4 France (M. Abeille, G. Turret, E-L. Melenec)

- [ATL95S1] Atlantic Arc Commission, (1995), An Atlantic Arc vessel traffic service, Study.
- [ATL95S2] Atlantic Arc Commission, (1995), Transshipment study, Study.
- [FRA95T] A renewed view on shortsea shipping, (1995). Position paper submitted by the Ministry of Transport.
- [ITD95S] Impact of idle time and delays due to road congestions and restrictions, (1995), proposed study in the context of SSS promotion.
- [LEC95S] Lecoq S., Chevance A., (1995), Prospective Study into the development of dry bulk traffics to, from and within the Atlantic Arc of Europe, Study
- [SRR95S] SeaRiver Road as an alternative and an extension to all Road or SeaRoad Transport, (1995), proposed study in the context of SSS promotion.

#### 6.2.5 Germany (I. Harre, V. Speidel)

- [ATL94P] Atlas Elektronik, (1994), SUMO: Scenario Investigation of Maritime Transport Systems in the Baltic Area, RORO'94 conference, Gothenburg.
- [HAD95S] Hader, A, (1995), Possibilities for the introduction of new transport concepts within the SSS traffic between Scandinavia and the Weser ports. Study for Senator of Bremen for Ports, Shipping and Foreign Trade.
- [KRA95S] Kramer, H., (1995), Possible improvements of the marketing in SSS. Study for the Transport Ministry of Lower Saxony.
- [KRA96S] Kramer, H., (1996), A feasibility study for a market-supply-concept in SSS on identified relations within Northern Europe/Germany/Western Europe with the consideration of shift potentials. Study for the German Transport Ministry.
- [ZAC91S] Zachcial, M., (1991), Short Sea Shipping Study 1991: Contribution of short sea shipping for transport-solutions in the internal market. Study for German Transport Ministry.
- [ZAC96S] Zachcial, M., (1996), Simulation-project with a transport modelling on shifting effects in SSS. Study for for the German Transport Ministry.

#### 6.2.6 Greece (S. Papadimitriou, H. Psaraftis)

- [COM94H] Combimare, ADK Consulting Engineers, and Triton Consulting Engineers (1994), Greece - Italy - Germany Multimodal FreightTransportation Corridor. Pilot Project, sponsored by CEC.
- [DRO93S] Dromos Consultants et al, (1993), Strategic Transport Plan - Greece 2010. Study sponsored by Greek Ministry of National Economy.
- [FRE95S] Frederic Harris, (1995), Short -Sea Shipping / Greek Case Study. Sponsor: CEC DGVII.
- [GPS92S] Greek Passenger Shipping: Economic analysis of its operations, (1992). Study sponsored by the Center of Planning and Economic Research (Greece).
- [IMP95S] Impetus Consultants, (1995), Network Development for Sea Transport in the Aegean Sea. Study sponsored by the Greek Ministry of the Aegean.
- [KAR95T] Karadimitropoulos, G., (1995) Greek Coastal Shipping (in Greek), Diploma Thesis, NTUA.
- [NTU94S] National Technical University of Athens (1994), Greek Coastal Shipping: Status, Prospects, and Investment Opportunities. Study sponsored by the Hellenic Industrial Development Bank (ETBA).
- [PRA95S] Praxis Consultants, (1995), Examination of the current situation for sea transport in the Aegean Sea. Study sponsored by the Greek Ministry of the Aegean.
- [PSA94P2] Psaraftis, H.N., G.J. Nellas, V.F. Magirou, G.C. Nassos (1994) "Greek Coastal Shipping System: Impact of New Technologies and Market Deregulation on Modal Split". Proc. TRISTAN-2 Conference, Capri, Italy.
- [PSA91A] Psaraftis, H.N., "Ports and Intermodal Transportation ", (in Greek). Oikonomikos Tachydromos (issue of 5 Dec.1991, pp.31-33).
- [PSA93P] Psaraftis, H.N., "Prospects for Conventional Passenger-Car Ferries in the Aegean", Proc. International Conference on Overcoming Isolation, Plomari, Lesbos, March 1993.

- [PSA93P] Psaraftis, H.N., "Prospects for Conventional Passenger-Car Ferries", THALASSA-1 Conference, Piraeus- Iraklio, April 1993.
- [PSA93A] Psaraftis, H.N., A.D. Papanikolaou, "Waiting for 2004". Naftiliaki, special issue on Mediterranean Passenger Shipping, October 1993.
- [PSA94P] Psaraftis, H.N., "Lifting of Cabotage by 2004", THALASSA-2 Conference, Piraeus, April 1994.
- [PSA94A] Psaraftis, H.N., "Greek Coastal Shipping: 2004 at the End of the Tunnel," (in Greek). Oikonomikos Tachydromos (issues of 10 Nov. 1994, pp. 26-32, and of 17 Nov. 1994, pp. 31-36).
- [SNV93S] SNV, Studieengesellschaft Verker mbH, et al (1993), Sealink - Improvements of transport connections across national borders. Study sponsored by CEC, RECITE Program.
- [SCH94T] Schinas, O., (1994) The Transportation of Goods between Greece and the rest of Europe: Status, Prospects and Recommendations (in Greek), Diploma Thesis, NTUA.
- [TRA88S] Trademco Consultants, (1988), The role of transport in the movement of products to/from Crete. Study sponsored by the Greek Export Promotion Organization.
- [TRA93S] Trademco Consultants, (1993), Pilot Action for a Pilot Operation of RoRo ships between NAVIPE (Gr) and Italy. Study sponsored by the Hellenic Industrial Development Bank (ETBA).

#### 6.2.7 Ireland (V. Kenny)

- [ARC95S] Arc Atlantique 3.8, (1995), study.
- [BOO93S] Booz-Allen & Hamilton, (1993), Evaluation of actions in the fields of telecom and transport in Greece, Ireland, and Portugal. Sponsored by the CEC, DG XVI-B.
- [COL91H] Coleman, M., (1991), Cross Channel Passenger Traffic 1960-1990. Project sponsored by the Statistical & Social Inquiry Society of Ireland.
- [COL92H] Coleman, M., (1992), Modal Competition on the Irish Sea. Multipartner Project sponsored by the Chartered Institute of Transport in Ireland.
- [COL91P] Coleman, M., (1991), Ports and Shipping, paper.
- [COL92P] Coleman, M., (1992), The Southern Corridor - The Gateway to Europe? paper sponsored by Stena Sealink.
- [COL93P] Coleman, M., (1993), A Japanese Lesson for Irish Shippers and Carriers, paper sponsored by Alps Electric Irl. Ltd.
- [COL94P] Coleman M., (1994), Sailing into the Millennium, short paper.
- [OSH89T] O' Shea, J., (1989), Open-type hatchcoverless Containership. Technical report, sponsored by Bell Lines Ltd and Integrated Energy Systems. Thermie Grant aid from DG XVII.
- [KEN92T] Kenny J., (1992), Design philosophy and operational experience of the containerships "Bell Pioneer" and "Euro Power". Report to Eurocontainer Shipping plc.
- [TRA94S] Trant, G., (1994), Shipping Unitised Cargoes in Ireland. Nautical Enterprise Centre, Cork. Study sponsored by the Commission of European Communities, DGVII.
- [TRA95T] Trant, G.,(1995), A Regional Traffic Service-It's relevance in Ireland, Preliminary document, Nautical Enterprise Centre, Cork, for the Department of the Marine.
- [TRA95H1] Trant, G.,(1995), Implementation of Hazmat Directive in Ireland, Project, Nautical Enterprise Centre, Cork. Sponsored by the Irish Government.
- [TRA95H2] Trant, G., (1995), Casualty at Sea Data Base, Project, Nautical Enterprise Centre, Cork. Sponsored by Irish Marine Emergency Services, Department of the Marine.
- [TRA95H3] Trant, G., (1995), Design of Classic Boats, Project, Nautical Enterprise Centre, Cork. Self sponsored.

#### 6.2.8 Italy (C. Camisetti)

- [BIA92H] Bianco L., (1992), Progetto Finalizzato Trasporti 2 (PFT2), Research Project, sponsored by the Italian National Research Council.
- [LVC95S] Libro Verde Confitarma, (1995), National Study, sponsored by Confitarma (Italian Shipowners Association).
- [TAR94H] Targeted Research Action TRA-NESS: New Ship Concept on the framework of Short Sea Shipping, Coordinator CETENA Spa, sponsored by EU DGXII.
- [SON95S] Safety of Navigation: The hydrocarbon traffic and the environment protection,, (1995), Study sponsored by the Italian Parliament.

#### 6.2.9 Netherlands (R. Bagchus, S. Winkel)

- [ALB92H] Albus, W., K. van der Hoeven(1992), Shortsea, Research
- [BAG93H] Bagchus, R. C., N.S. Winkel (1993), Sea change for road freight (Coaster and feeder traffic plan). National Research, DGSM
- [BAG94T1] Bagchus, R. C. (1994), Statement on Shortsea shipping by the Dutch Ministry of Transport, Public Works and Watermanagement (the Netherlands, Belgium, Germany).
- [BAG94T2] Bagchus, R.C., N.S. Winkel, P. Bleumink, F.Kranenburg, R. Seignette (1994), Report symposium on shortsea shipping. DGSM, Buck, EVO, GHR.
- [BAG95S] Bagchus, R. C., N.S. Winkel, F. Kranenburg, R. Seignette (1995), Shortsea Shipping: a strategy for 1995 and the following years. Policy study by DGSM, EVO, Port of Rotterdam.
- [BUC94T1] Shortsea transport, a product of the port of Rotterdam and four Northwest-european competitors , (1994),Report by AVV; Buck.
- [BUC94T2] Shortsea transport, a product of the port of Rotterdam and four Northwest-european competitors (1994). Final survey by AVV, Buck.
- [DEJ93P] deJong, M. (1993),: From home-trade to ocean-going trade (in Dutch), Maritime Journal 1993, pp. 73-82.
- [DGS90H] DGSM, NEA, and MERC, (1990), Potential shift of cargo from road to sea (in Dutch), National Research.
- [DGS93S] DGSM, (1993), Shortsea shipping and feedertransport. Policy study.
- [DGS95T1] DGSM, NEI, (1995), Telematics in shortsea shipping: first memorandum: an analysis of the information and communications structure.
- [DGS95T2] DGSM, NEI, (1995), Telematics in shortsea shipping: second memorandum: the possible application of telematics in shortsea shipping.
- [DGS95T3] DGSM, NEI, (1995), Telematics in shortsea shipping: third memorandum: Proposals for projects "Telematics in the Shortsea chain"(concept).
- [DRE93A] H.P. Drewry, (1993), Feeder and shortsea container shipping: regional market structures, modal competition and economics.
- [ECL94H] Electronic communication in short sea shipping: an exploration by Coopers & Lybrand, (1994), Research.
- [ECM93T] Shortsea shipping by ECMT (1993). Research report.
- [FAI91A] Fairplay international shipping weekly (1991) (1) The current situation concerning the shortsea vessel newbuildings in the UK, Germany and the Netherlands. (2) Bilbao-based Eurobulk shows the success of creating a pool. (2) The risks of coastal shipping. A series of three short articles on shortsea shipping.
- [GRO93H] "Groene Golf": final survey, trial shipping line, project Trade-routes (1993), Research by DGSM, MST, MERC, HARRIS.
- [HOO91H] Hoogerbrets, J. , R.L. Tollenaar, M.M. Kraan, B. Smeenk, (1991), Shift of cargo from road to sea (in Dutch). National Research, MERC and NEA.
- [HMC91H] Hydrographic and Marine Consultants, (1991), Short-sea trade confrontation of supply and demand, Research.
- [JOR95H] Jorna, R.A.M., C.A. Verweij, H. Speksnijder (1995), Telematics in shortsea shipping: final survey by NEI, and MERC.
- [MER94H] Mercer, (1994), Legal liability in maritime transport with particular reference to short sea shipping and the Hamburg rules: final report to CEC DGVII.

- [ROT91H] Short Sea shipping lines and feeder services: between Rotterdam and European Ports , (1991), Port of Rotterdam, Research.
- [SSS93S1] Shortsea shipping in intermodal transport: start of a campaign by DST Educatieve Communicatie, DGSM (1993), Study.
- [SSS93S2] Shortsea shipping in intermodal transport: final survey by DST Educatieve Communicatie, DGSM (1993). Study.
- [SUK88H] Short sea bulk shipping: an analysis of UK performance , (1988). Department of Transport, London. Research project.
- [VAN93A] van der Burg, J. (1993), Rotterdam-Scandinavia shortsea shipping in the future, International Bulk Journal.
- [VAN93H] vanHasselt , A.A. van der Staaij (1993), The EU and Shortsea shipping: opportunities and threats for Mainport Rotterdam by “Kerngroep Strategische Verkenning”. Research, Haveninformatie Bank.
- [VAN95H] van Rheenen, P., R. Seignette, (1995), Shortsea shipping between Rotterdam and Bilbao, Research.
- [WIJ93B] Wijnolst, N., C. Peeters, P. Liebman (1993), European shortsea shipping: proceedings from the first European research roundtable conference on shortsea shipping. Lloyds of London Press.
- [WIJ94T] Wijnolst, N., (1994), Inland shipping: Port hoppers: new developments in short sea shipping by Inland shipping. Short report.
- [WIJ95B] Wijnolst, N., C. Peeters, P. Liebman (1995), European shortsea shipping: proceedings from the second European research roundtable conference on shortsea shipping. Lloyds of London Press and Delft University Press.

#### 6.2.10 Norway (A. Minsaas, J. Mohr)

- [BAA92T] Baardsen T., (1992), Fast Boat Industry, Report, SNF.
- [DNV94H] Det Norske Veritas, (1994), Green Ships, National Research Programme, sponsored by the Research Council of Norway, Norwegian Shipowners Association, Norwegian shipowners, maritime industry
- [FRA92T] Frøfjord J., Johnsen C., (1992), A Study of North Sea Trade, Report, SNF.
- [HAA94T] Haaland J., Norman D. V., (1994), Regional effects of European Integration, Report, SNF.
- [HAA94P] Haaland J., (1994), The Trade Effects of European Integration, The World Economy, vol. 17, no.5, September.
- [KVA96H] Kvaerner, (1996), Ship for the future -the Ship R3D programme, self sponsored.
- [MAR98H] MARINTEK, (1998), Short Sea Shipping, National Research Programme, sponsored by The Research Council of Norway, Norwegian Shipowners Association, Norwegian shipowners, maritime industry, commodity owners.
- [MAR97H] MARINTEK, (1997), Information Technology in Ship Operation, National Research Programme, sponsored by the Research Council of Norway, Norwegian Shipowners Association, Norwegian shipowners, maritime industry.
- [MAR92H] MARINTEK, (1992), High Speed Marine Vehicle, National Research Programme, sponsored by the Research Council of Norway, Norwegian Shipowners Association, Norwegian shipowners, maritime industry, insurance companies.
- [MOR95H] MARINOR, (1995), National Research Programme, sponsored by the Research Council of Norway, the Association of Norwegian Shipbuilders, maritime industry.
- [MAR93H] MARINTEK, (1993), Maritime Information Technology, National Research Programme, sponsored by the Research Council of Norway, Norwegian Shipowners Association, Norwegian shipowners, maritime industry.
- [NOR94A] Norman D. V., (1994), Speed and Transport Economics, Article, SIOS news 3/Sep/94.
- [NOR95P] Norman D. V., Venebles A.J., (1995), International trade, factor, mobility, and trade costs, Economic Journal.
- [ROB93H] Simrad Robertson, (1993), Electronic Chart Display and Information System - ECDIS, National Research Programme, sponsored by the Research Council of Norway, maritime industry.
- [STR94P] Stranden S.P., (1994), Competition between transport modes in deregulated European markets, Paper, prepared for Transport Econometrics, Calais, January.

[WEG95T] Wergeland T., Osmundsvaag A., (1995), The Fast Boat Market, Report, SNF.

#### 6.2.11 Portugal (H. Cid, M. Ventura)

- [CAR92S1] Carichas E., (1992), Evaluation of Costs for Sea Container Cargo System Between Azores Islands and Mainland, Study conducted by RINAVE and sponsored by the Azores Regional Secretary of Transports and Communications.
- [CAR92S2] Carichas E., (1992), Study on Sea Transport for General Cargo in Azores Islands, Study conducted by RINAVE and sponsored by the Azores Regional Secretary of Transports and Communications.
- [GAM95S] Gama, P. B., E. Martins , A. Nunes, A.R. Gomes, (1995), OBSERVATÓRIO - Creation of a work group for the traffic analysis (flow of ships and cargoes) between the Madeira island and the continent. Direcção-Geral de Portos, Navegação e Transportes Marítimos.
- [IHN95H] Integrated Harbour Navigation Control System (NATO Po-Navigation) (1995). Prototype of an integrated control system for the navigation control in the port of Sines.
- [MAU91S] Mauricio E., (1991), Study of Sea Transport for Petroleum Liquid Products in Azores Island, Study conducted by RINAVE and sponsored by the Azores Regional Secretary of Transports and Communications.
- [POR93H] PORTLINE Transportes Marítimos Internacionais (1993), PORTTRAILER - Ship Transportation of Trailers Between the Ports of Leixões/Portugal and Zeebrugge/Belgium. Research, self-sponsored.
- [QSD95H] Quick Ship Dispatch Centers, Project developed in the port of Sines.
- [SIN95H] SINAVE Port System, (1995). Computerised system developed by the Administration of the Port of Sines.

#### 6.2.12 Spain (G. de Melo, M. Carlier)

- [CAR92S] Carlier M., (1992), Analysis of the EEC national cabotage trades, as a part of the global European SSS market. Study sponsored by Spanish Shipowners Association (ANAVE).
- [CON93S1] Consultrans, (1993), Maritime liner services in Spanish cabotage (in Spanish). Study sponsored by Ministry of Public Works, Transport and Environment (MOPTMA).
- [CON93S2] Consultrans, (1993), Present situation and perspectives for the maritime cargo transport with the Canary and Balearic islands (in Spanish). Study sponsored by Ministry of Public Works, Transport and Environment (MOPTMA).
- [CON93S3] Consultrans, (1993), Analysis between the competition between Spanish and EU ports (in Spanish). Study sponsored by Ministry of Public Works, Transport and Environment (MOPTMA).
- [GEN94S] General Directorate for Economic Policy - Ministry of Economy, (1994), Report from the COMINPORT to the Spanish Government on the ports functioning (in Spanish). Study.
- [GEN95S] General Directorate for Economic Policy - Ministry of Economy, (1995), Update of the work of the COMINPORT to September 1995(in Spanish). Study.
- [GOM95P] Gomez-Ferrer, R.V., R. del Moral, (1995), Impact of the shortsea shipping promotion policy on ports, Study sponsored by Port Authority of Valencia. Published in the "Ingenieria Naval" magazine.
- [ING92S] Ingenieria de Asistencia, (1992), Spanish Island Shortsea Shipping. Present and future plans (in Spanish). Sponsored by PYMAR.
- [MAR93S] Marcial Echenique y Cia, (1993), Passenger Transport between the Gran Canaria and Tenerife islands (in Spanish). Study sponsored by Ministry of Public Works, Transport and Environment (MOPTMA).
- [MEN94T] Meneses P. A., (1994), Shortsea shipping development requirements. Report of the Director General de la Marina Mercante.
- [MER91S] MERC, and Dynamar, (1991), Intra-European Shortsea Trades and Shipping, Study.
- [MER94S] MERC, CETEMAR and other 4 consultant firms, (1994), The impact of liberalization of maritime cabotage in the EU, Study

- [MOR93P] Moret, J.A. A.P. de Lucas and J.L. Tejedor, (1993), A reliable answer in fast ferry design. Proc. FAST '93.
- [PEE93S] Peeters, C., G. Polo, (1993), The impact of the Spanish mainland cabotage liberalization on the competitive position of the Spanish shipping industry. Study sponsored by CEC and Spanish Government.
- [PYM91S] PYMAR Pesqueros y Medianos Astilleros Sociedad de Reconversion (1991), The maritime industries in Spain (in Spanish). Self sponsored.
- [SEN92P] Sendagorta, I., R. Uriarte, G. Pirez-Gomez and J. Gonzalez-Adalid, (1992), Performance improvements in the ship "Sierra de Guadarrama" with CLT propellers. (in Spanish). Published in "Rotacion".
- [SIE95P] Sierra, H., J.L. Tejedor, (1995), Fast Ferry "Alhambra": The MESTRAL Grant version. Cruise & Ferry '95, London.
- [SIE93P] Sierra, H. A. P. de Lucas, (1993), Ferry Rapido'92: A monohull solution. Cruise & Ferry '93, London.
- [PIR94P2] Pirez-Gomez, G. and J. Gonzalez-Adalid, (1994), Contrarotating and tandem CLT propellers. Published by SNAME, USA.
- [PIR94P1] Pirez-Gomez, G. and J. Gonzalez-Adalid, (1994), Tip loaded propeller (CLT). Justification of their advantages over conventional propellers using the Momentum Theory. Published in "International Shipbuilding Progress".
- [ZAT92A] Zatarain, G. (1992), Experience with retrofitting CLT propellers. Published in "the Motor Ship".

#### 6.2.12 Sweden (A. Sjöbris)

- [ALE94H] Alexandersson, A., et al, (1994), Potential Development in Sea Transport Systems Europe, MARITERM AB. Sponsored by the Swedish Transport and Communications Research Board (KFB).
- [HUL90S] Hultén, L., K. Lumsden(1990), Domestic shortsea shipping- Goods flow and future outlook. Sponsored by the Swedish Transport Research Board (TFB).
- [LUM93S] Lumsden, K. (1993), System development of standardised unit load carrier for sea, road and rail transport. Study sponsored by the Transport Foundation (Transportstiftelsen VTS), Western Sweden Chamber of Commerce.
- [ROB90S] Robertson, H. , (1990), Mechanised mooring. Pre study, MARITERM AB. Sponsored by the Swedish Transport Research Board (TFB).
- [SJO90S1] Sjöbris, A., (1990), Coastal and SSS. Pre study, MARITERM AB. Sponsored by the Swedish Transport Research Board (TFB).
- [SJO90S2] Sjöbris, A. (1990), Integration of cargo units between railway and shipping. Pre study, MARITERM AB. Sponsored by the Swedish Transport Research Board (TFB) and the Swedish State Railway (SJ).
- [SJO93S] Sjöbris, A., (1993), Coastal and shortsea shipping. Technical feasibility study, MARITERM AB. Sponsored by the Swedish Transport Research Board (TFB).
- [SJO95H] Sjöbris , A, et al, (1995), Coastal and Short Sea Shipping Market Study. MARITERM AB. Sponsored by the Swedish Transport and Communications Research Board (KFB), Provincial governments and major industries in north-east Sweden
- [WIJ94S] Wijnolst, N. H. B. van der Hoeven, C. J. Kleiwegt, A. Sjöbris, (1994), Innovation in SSS: self loading and unloading unitload shipsystems, Study sponsored by CEC DG VII, the Swedish Transport and Communications Research Board (KFB), the Dutch Foundation for the Coordination of Maritime Research.

#### 6.3 DGVII 4th FP projects

- [ASD96H] Project "ASDSS": Analysis of supply and demand of shipping services.
- [BOP96H] Project "BOPCOM": Baltic open port communication system.
- [EBO96H] Project "EUROBORDER": Identifies bottlenecks, develops functional specifications and proposes demonstrators to improve the ports' function as intermodal hubs.
- [EEI96H] Project "E-EIS Transport Sector": Development of the E-EIS methodology for the European transport sector and its application to the European shipping sector.

- [EMM96H] Project "European Marine Motorways": The potential for transferring freight from road to high speed sea transport.
- [IPS96H] Project "IPSI": Improved port-ship interface.
- [SPH96H] Project "SPHERE": Small/medium sized ports with harmonised, effective re-engineered processes.
- [SSS96H] Project "SSS-CA", concerted action on shortsea shipping.

#### 6.4 DGVII/D studies

- [EUR96S] Europaeisches Entwicklungszentrum fuer die Binnenschifffahrt, feasibility study on the establishments of river-sea transport between Portugese sea ports and Duisburg.
- [INT96S] Intermodal European Logistic Center, Short sea shipping pilot - project German North Sea - Nordic countries / Western and Southern Europe.
- [MER95S] Mercer, (1995), Evaluation of the potential for a coastal cabotage service in the Mediterranean rim.
- [MST96S] MST Transmodal, Feasibility Study on the development of short sea shipping and inland waterway links between Holstebro-Struer and Duisburg.

#### 6.5 Telematics projects (input provided by V.Speidel on behalf of ISL Bremen)

- [COR96H] COREM(1996). Cooperative Resource Management for the Transport of Unit Loads, DGXIII project, 4th FP.
- [COS96H] COST330 (1996). Teleinformatics Links Between Ports and their Partners, Project of the Commission of European Community, DG VII and national sponsors.
- [EIE96H] EIES, (1996). European Information Exchange Service for the Communication between Harbour Areas, DGXIII project, 4th FP.
- [INT96H] INTERPORT, (1996). Integrating Waterborne Transport in the Logistic Chain, DGXIII project, 4th FP.
- [ISE95H] Innovative Seaport Technologies (1995), German Ministry for Research and Technology, Project.
- [LOC96H] LOCALE (1996). Low Cost Applications for Linking EDI, Project of the Commission of European Community, MARIS Programme, DG VII.
- [MUL96H] MULTITRACK (1996), Tracking, tracing and monitoring of goods in an intermodal and open environment, DGXIII project, 4th FP.
- [POS96H] POSEIDON (1996). DGXIII project, 4th FP.
- [TIL96H] TILEMATT (1996), DGXIII project, 4th FP.
- [VAD96H] VADE MECUM(1996), DGXIII project, 4th FP.
- [WEL96H] WELCOM (1996), DGXIII project, 4th FP.
- [WIS96H] WISDOM (1996). Waterborne Information System Distributed to Other Modes, DGXIII project, 4th FP.

#### 6.6 BRITE-EURAM (DGXII) projects (input provided by A. Papanikolaou and J. Grant on behalf of WEGEMT and by C. Camisetti on behalf of the TRA-NESS targeted research action)

- [HYD95H] HYDROSES (1995). An integrated theoretical/experimental hydrodynamic procedure for design of large SES Ships.
- [MAI95H] MAINCOMPSES (1995). Improvement of main system components and ride control system for fast passenger and cargo large surface effect ship.
- [MAT95H] MATSTRUTSES (1995). Advanced materials and design procedure for large size SES structures.
- [SHI95H] SHIP (1995) Ship hull integrity program.
- [SES95H] SESLAB (1995) Development of an experimental tool for design of large SES Fast Ships.

#### 6.7 Other input from WEGEMT (ship design/shipbuilding/ engineering projects or publications; input provided by A. Papanikolaou and J. Grant and arranged by contributing country)

##### 6.7.1 Belgium

- [TRU96H] Truijens P., Preliminary design of a low profile coaster, Research (privately founded), U.Gent.

#### 6.7.2 Denmark

- [DES95H] Design of fast ferries (1992 - 1995), Research, Technical University of Denmark (DTU), Danyard and Danish Academy of Technical Sciences (ATV).  
 [DES96H] Design of a Harbour ferry, Research, Technical University of Denmark (DTU).  
 [WAV96H] Wave-induced hydroelastic response of fast mono-hull ships, Research, Technical University of Denmark (DTU) and Danish Technical Research Council (STVF).

#### 6.7.3 France

- [ENA94H] Enault J.E., (1994), MONOQUE, Research.  
 [HOO94H] Hoof van R.W., (1994), Project Trimaran High Speed Ferry, Research.  
 [LAN95H] Lancelot E., (1994), Feasibility study for the route Marseilles to Barcelona by a fast marine transportation system (in French), Research.  
 [MAR94H] Marchand P., (1994), MENTOR, Research.  
 [PER94H] Perdun P., (1994), AGNES 200, Research.  
 [QUI94H] Quillici J.F., (1994), An estimate of the need for fast passenger transportation, Research.

#### 6.7.4 Germany

- [BER96T] Bertram, V. (1996), Various Aspects of Fast Sea Transportation (9 publications), Technical Report, Univ. Hamburg.  
 [BMB94H] BMBF, STN, ISSUS, (1994), BV scenarios: Maritime Transport systems for the Baltic Sea (in German), Research, BMBF.  
 [ENG95H] Engelkamp, (1996), Inland water transport between North Spain and Duisburg (in German), Research, German Ministry for Research and Technology.  
 [ISE95S] Isensee, J., (1995), Energy Consumption and Air Pollution - A comparison between Ships and other Transport Vehicles, Study, Proc. STG Yearbook, Vol. 90 (in German).  
 [KOH94T] Kohnagel, J., Bertram, V., (1994), Conceptual Design of a Ro-Ro catamaran for Shortsea Shipping, Technical Report, Univ. Hamburg.  
 [LAN94H] Lange, Ivanov, (1994), Development of a large sea-river ship for intermodal cassette transport (in German).  
 [LIN88S] Linde, H. (1988), International Series of conferences on Eastern/Western co-operation and competition in Shipping, Study.  
 [LIN90S] Linde, H. (1990), Analysis of the German and European shortsea shipping system, Study, German Ministry for Research and Technology.  
 [LIN95S] Linde, H. (1995), Inland and combined inland/coastal shipping in the Oder river and the Baltic Sea, Study, Local State Governments of Brandenburg and Berlin.  
 [MAR93S] MARITERM AB, (1993), Coastal and Short-Sea Shipping - Technical Feasibility Study.  
 [MUE96H] Mueller, E. (1996), Development of a large sea-river ships with limited draft (in German) 4 projects, Research, German Ministry for Research and Technology.  
 [POE95S] Poehls, H., (1995), Trends in the development of containerships (4 publications), Study.  
 [PUS94S] Pusch, (1994), Protection of the local conditions for the maritime industry in Germany (in German), Study.  
 [WIE95B] Wietasch, K. (ed), (1995), School Notes of 21<sup>st</sup> WEGEMT Graduate School on Ships for Coastal and Inland Waters (Design, Building, Operation).  
 [WIE96H] Wietasch, K. (ed), (1996), Colloquium in Shipbuilding and Ocean Technology, Research.

- [ZIP95T1] Zips, J. (1995), Development of Fast Catamarans (3 projects within the national R&D program SUS, in German), Technical Report, German Ministry for Research and Technology.
- [ZIP95T2] Zips, J. (1995), Development of Surface Effect Ships - SES (4 projects within the national R&D program SUS, in German), Technical Report, German Ministry for Research and Technology.
- [ZIP95T3] Zips, J. (1995), Development of SWATH ships (project within the national R&D program SUS, in German), Technical Report, German Ministry for Research and Technology.

#### 6.7.5 Greece

- [PAP91H] Papanikolaou, A. (1991), Hydrodynamic Analysis and Preliminary Design of a SWATH Passenger Car Ferry, Research, Ship Design Laboratory - NTUA
- [PAP94H] Papanikolaou, A. C. Koskinas, K. Pigounakis, N. Bouliaris, (1994), SMUCC - Development of a fast intermodal transportation system for shortsea shipping in Europe based on a SWATH Multipurpose Container Carrier design, Research, Ship Design Laboratory - NTUA
- [PAP95H1] Papanikolaou, A. (1995), Hydrodynamic Analysis and Feasibility Study of a fast catamaran ferry for Greece, Research, Ship Design Laboratory - NTUA
- [PAP96H] Papanikolaou, A., N. Daphnias, (1996), Development of the 80m LOA catamaran passenger car ferry SUPERCAT HAROULA, Project, ALPHA MARINE Ltd.
- [PAP95H2] Papanikolaou, A. (1995), Practical Implications of the new SOLAS regulations to the Greek Passenger Ferry Fleet, Research.

#### 6.7.6 Italy

- [BEN96P] Benevenuto, G., Fiagri M., Rossi E., (1996), Environmental impacts of land and maritime transports in urban areas, Paper, 2nd International Conference on Urban Transport and the Environment in the 21st century, Barcelona October 1996
- [BRU92H] Bruzzone D, Ferrando M., (1992), Numerical evaluation of the steady free surface flow for catamaran hull forms, Research, Symposium on High Speed Marine Vehicles, Napoli, April 1992.
- [BRU94H] Bruzzone, D., Sebastiani L (1994), Application of a panel method to the hydrodynamic analysis of advanced vehicles, Research, Italian Ministry for the University and Scientific and Technological Research.
- [BRU94H2] Bruzzone, D. and Sebastiani L., (1994), A unified panel method for steady and unsteady free surface calculations, Research, International Conference on Ship and Marine Research, NAV94 Rome.
- [BRU95P] Bruzzone D, Pittaluga A, Podenzana-Bonvino C., (1995), Feasibility of a second order strip theory of the longitudinal strength of ships, Paper, VI Symposium on Practical Design of Ships and Mobile Units (PRADS 95), Seoul, Sept 1995.
- [CAR95P] Carrera G, Rizzuto E., (1995), Notes on the characterisation of the acoustical performances of viscoelastic materials to be used in the floors of cabins on board ship. (in Italian), Paper, XXIV AIAS National Congress, Parma Sept 1995.
- [CAS96P] Cassella P, Pensa C, Russo-Krauss G., (1996), Feasibility of a second order strip theory of the longitudinal strength of ships, Paper, ATMA 96, Paris.
- [CAS95P1] Cassella P, Miranda S, Pensa C, Russo-Krauss G., (1995), Hydrodynamic performances of catamarans. (in Italian), Paper, 2nd Congress of the National Transport Plan, Genoa May 1995.
- [CAS95P2] Cassella P, Miranda S, Pensa C, Russo-Krauss G., (1995), Comparison between the catamarans and the monohull resistance characteristics. (in Italian), Paper, ISSH International Symposium on Ships, St Petersburg 1995.
- [MAE92A] Maestro M, Marino A., Russo Krauss G., A particular aspect of the operational safety of ships: the assessment of stability under varying conditions of service. (in Italian), Article, Tecnica Italiana LVII n.3 1992.
- [MAE93A] Maestro M, Marino A., Russo Krauss G., (1993), Traffic in short sea shipping and ro-ro vessels: considerations on safety. (in Italian), Article, Studi Marittimi n.43 1993.

- [MUS95P] E Musso, Dr C Migliaro, (1995), Maritime transport of people in urban areas, Paper, Computational Mechanics Publications - Southampton Boston.

#### 6.7.7 Netherlands

- [HEN95B1] Hengst, S. (1995), The future of waterborne transport, Delft University Press.  
 [HEN95B2] Hengst, S. (1995), Focus on inland waterway shipping, Delft University Press.  
 [HEN95B3] Hengst, S. (1995), Total Quality Management - Theory or Practise? (in Dutch), Delft University Press.  
 [WIN93B1] Wijnolst, N., R. van der Lugt, (1993), Innovation in forest products shipping, Delft University Press.  
 [WIN93B2] Wijnolst, N., H. B. van der Hoeven, C. J. Kleywegt, A. Sjöbris, (1993), Innovation in Shortsea Shipping, Delft University Press.

#### 6.7.8 Norway

All entries provided are already covered in section 6.2.10.

#### 6.7.9 Spain

- [ROU95H] Optimizing routing system for the advanced design cruiser ship (1995), Research, Spanish Administration (CICYT), managed by the CDTI.  
 [VTS95H] Implementation of the VTS in the Spanish coast (1995), Project sponsored by the Spanish Transport Department, Maritime Administration.

#### 6.7.10 United Kingdom

- [BUR96H] Burns, R. S., G. N. Roberts, M. M. Pourzanjani. Modelling and control of small vessels, Research, EPSRC (MTD), Marinex, Polytechnic South West.  
 [KIN96S] King, G. A., D. C. Keith, M. J. Dove. Prediction modelling the visibility of small maritime targets, Study, Southampton Institute.  
 [MOL96H1] Molland, A. F., J. F. Wellicome. The identification of the resistance components of catamarans, Research, EPSRC (MTD), Southampton University.  
 [FAU96H] Faulkner, D., A. Incecik, Non-linear hydro-structural behaviour of fast multi-hull marine vehicles in waves, Research, EPSRC (MTD), Univ. of Zagreb, Yarrow.  
 [WEL96H] Wellicome, J. F., P. Temarel, A. F. Molland, The determination of the motions and hull loading characteristics of catamarans in waves, Research, EPSRC (MTD), Southampton University.  
 [PRI96H] Price, W. G., R. A. Sheno, P. Temarel, Design of aluminium structures subjected to high frequency, high cycle loadings, Research, EPSRC (MTD), Vosper Thornycroft, FBM Ltd, Southampton University.  
 [SHE96H] Sheno, R.A., H. G. Allen, Fatigue design of weight-critical FRP sandwich structures, Research, EPSRC (MTD), Southampton University.  
 [DOV96H] Dove, M.J., C.T. Stockell, R.S. Burns, A navigation and collision avoidance system for marine vehicles, Research, EPSRC (MTD), Kelvin Hughes, WS Atkins, University of Plymouth.  
 [GRI96H1] Grimble, M. J., Integrated advanced propulsion and ship control for marine systems, Research, EPSRC (MTD), MoD, Strathclyde University.  
 [MOL96H2] Molland, A. F., The development of improved techniques for the prediction of ship rudder performance characteristics, Research, EPSRC (MTD), MoD, Southampton University.  
 [BET96H] Bettess, P., P. Sen, J. B. Caldwell, Development of intelligent knowledge-based design systems for marine technology, Research, EPSRC, Newcastle University.  
 [HOR96H1] Horsley, M.E., Modelling of fires in steel ships and offshore structures, Research, EPSRC (MTD), Portsmouth.  
 [MIL96H] Millward, A., J. L. Sproston, Numerical modelling of the flow around ship hulls with special reference to high-speed hulls and shallow water, Research, EPSRC (MTD), Liverpool University.

- [SME96H] Smeaton, G. P., W. O. Dineley, A marine electronic chart system based on interactive video, Research, EPSRC (MTD), Kelvin Hughes, Action Information Ltd, Liverpool John Moores University.
- [ROB96H] Roberts, J. B., J. F. Dunne, On-line assessment of ship stability parameters, Research, EPSRC (MTD), BMT, University of Sussex.
- [FLO96H] J. O. Flower, M. M. A. Pourzanjani, M. R. Belmont, A sea surface estimator, Research, EPSRC, Exeter University.
- [THO96H] Thompson, J. M. T., Safe transient basins: a new tool for designing against capsize, Research, EPSRC (MTD), University College London.
- [CAL96H] Caldwell, J. B., M. Pawlowski, Development of knowledge-based design systems for marine technology - ship safety, Research, EPSRC (MTD), Newcastle University.
- [FAI96H] Fairlie-Clarke, A. C., I. E. Winkle, Construction of hydrodynamic lifting surfaces, Research, EPSRC (MTD), Brown Brothers, Glasgow University.
- [SEN96H] Sen, P., M. J. Downie, Voyage management using parallel processing, Research, EPSRC, Newcastle University.
- [HOR96H2] Horsley, E., Modelling of fires in steel ships and offshore structures, Research, EPSRC (MTD), Portsmouth University.
- [HOC96H] Hockey, G. R., C. M. Crawshaw, Human performance in highly-automated bridge systems, Research, EPSRC, University of Hull.
- [POR96H] Pourzanjani, M. M. A., J. S. Habberley, M. J. Dove, Human performance in highly-automated bridge systems, Research, EPSRC (MTD), Southampton Institute.
- [FAN96H] Fan, M., Fluid impact loading on wedge-shaped bodies, Research, Strathclyde University.
- [GRI96H2] Grimble, J., M. R. Katebi, M. A. Johnson, Introducing adaptation into integrated ship control, Research, EPSRC, Strathclyde University.
- [ATK96H] Atkins, A. G., The tearing of ships' plating upon grounding, Research, EPSRC (MTD), MoD, University of Reading.
- [SME96H] Smeaton, G. P., S. K. Watson, P. G. Brooks, Real time decision support for marine pilotage, Research, EPSRC, Liverpool John Moores University.
- [SHE96H] Shenoi, R. A., Assessment of damage tolerance levels in FRP ships' structure, Research, EPSRC (MTD), MoD, Southampton University.
- [BEL96H] Belmont, M. R., E. L. Morris, A sensor for remote sea surface measurement, Research, EPSRC (MTD), MoD, Vickers Shipbuilders, Exeter University.
- [MOL96H] Molland, A. F., S. R. Turnock, Enhanced ship manoeuvring performance estimates through the effective design of rudder-propeller systems, Research, EPSRC (MTD), Southampton University.
- [VAR96H] Varyani, K. S., A. Incecik, A theoretical and experimental investigation of the hydrodynamics of a manoeuvring ship in deep and shallow water, Research, EPSRC (MTD), Glasgow University.
- [HEA96H] Hearn, G. E., A theoretical and experimental investigation of the hydrodynamics of a manoeuvring ship in deep and shallow water, Research, EPSRC (MTD), Newcastle University.
- [VAS96H] Vassalos, D., Ship capsizing in severe following/quartering seas by broaching-to (Visiting Fellowship), Research, EPSRC (MTD), Strathclyde University.
- [EAT96H] Eatock Taylor, R., A. G. L. Borthwick, Non-linear fluid-structure analysis of a fast ship during slamming, Research, EPSRC (MTD), Oxford University.
- [MCG96H] McGregor, R. C., J. Howell, A. Fairlie-Clarke, SWATH SHIPS. 1. Design and evaluation of control systems; 2. Optimum geometry for resistance, sea-keeping, slamming; 3. Design and evaluation, Research, EPSRC (MTD), MoD, YARD, YSL, VSEL, Brown Brothers, ARE, Glasgow University.
- [FAU96H] Faulkner, D., D. M. Warwick, A. Incecik, Integrated structural design of SWATH ships, Research, EPSRC (MTD), Glasgow University.
- [ROB96H] Roberts, G. N., J. Davis, Advance control strategies for motion control of vessels, Research, EPSRC (MTD), MoD, RNEC Manadon.
- [VAS96H] Vassalos, D., Ship capsize in severe following/quartering seas by broaching-to: a dynamical systems approach, Research, University of Strathclyde.