A GENERIC SHIP FOR THE SHORT SEA TRADES OF THE EU

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ABSTRACT

The Union of Mediterranean Trading Shipowners of Greece with the technical assistance of ICEPRONAV of Romania have developed a generic ship type that can be constructed in such ways to serve the needs of a wide spectrum of transportation requirements, while ensuring significant economies for the builder in series. The need for this exercise has arisen in the context of ESYAN where clustering of various ship types around the six thousand tons mark had to be taken advantage of in a way to generate scale economies for both, the owners and the builders. While no serious technical innovation is involved, this type of application is novel and offers measurable savings in identifiable areas of the construction. If the matter of the replacement of the Greek Short Sea Fleet is seen as part of the overall strategy of Greece in the post cabotage era of the EU, a large number of such vessels are expected to be built. This paper describes the rationale behind this project and discusses the opportunities and challenges to promote it.

KEY WORDS: Shortsea shipping; vessel design, intermodal transport

INTRODUCTION

In the European Commission's White Paper 'European Transport Policy for 2010: Time to Decide' [1], Short Sea Shipping (SSS) is one of the central pillars of the Community's transport policy for the current decade. Shifting traffic (mainly cargo) from road to sea is adopted as a main policy goal, and specific actions are proposed to move forward toward that goal (for a comprehensive review of the EU policy on SSS see [2]).

Such a goal is not new. It has been with the European Union for some time now, as growth in European road transport has been recognized to create major environmental problems, such as congestion, pollution, noise, accidents, and others. These problems create significant 'external' costs, which are not reflected in the price of services rendered and thus not recovered. The most recent estimate of the external costs of road congestion is 0,5% of Community GDP, something that will increase to 1% in 2010 (that is €80 billion a year) if no action is taken.

The latest news on the European scene as regards shortsea shipping is a cause of some concern. We present below a limited sample of issues.

1. In 1992, the Commission launched the PACT programme, to support intermodality and SSS, a programme that is considered successful by many circles. Yet, even though shortsea shipping grew considerably between 1990 and 2001 (31%), road transport grew even faster (38%). In fact, in 1985 road surpassed shortsea shipping as the top transporter in intra-EU trades in ton-km, a position that it held at least until 2001 and will continue to hold it if no serious action is taken. In 2001 the score was 1.395 billion ton-km for road versus 1.254 billion ton-km for shortsea shipping. The trend of these figures was even more disturbing, as 2001 saw a 1,3% increase in road transport versus 2000, whereas shortsea shipping dropped by the same percentage.

2. The Commission's 'flagship' program 'Marco Polo' to support intermodality including shifting cargo from road to sea is a main instrument within the new White Paper. Marco Polo is the successor of PACT, which ended in 2001. However, Marco Polo- whose funding has been weak from the outset- has encountered problems in the European Parliament and in the Council of Ministers. In fact, the EP was quite critical of this programme, on the grounds of possible distortion of competition across modes, lack of scientific documentation of external costs, and risk of transferring congestion from road to other modes, among other reasons.
3. In turn, the Council of Transport Ministers took considerable time to agree on Marco Polo, mainly in terms of money that should be allocated. PACT's budget was €53 million for 10 years. Marco Polo will receive about €100 million for the period 2003-2006, that is, about €25 million a year. One hundred million euros over five years to counter balance a sum of external costs of 400 billion euros over the same period! We are leaving any conclusions on the effectiveness of such regulation to the reader.
4. Last but not least, there is a very clear need for the renewal of the EU SSS fleet which not only is showing an elevated age, but it is composed almost exclusively of single skin vessels which have been –rightly or wrongly- accused of contributing to accidental marine pollution.

This paper takes a look at this last issue, from the perspective of the Union of Shipowners of Mediterranean Trading Vessels of Greece (EEMFP). The Union, with the technical assistance of ICEPRONAV of Romania, has developed a generic ship type that can be constructed in such ways to serve the needs of a wide spectrum of transportation requirements, while ensuring significant economies for the builder in series.

The need for this exercise has arisen in the context of ESYAN (initials for the Cooperation Committee for the Replacement in Greek, and an independent offspring of EEMFP) where clustering of various ship types around the six thousand tons mark had to be taken advantage of in a way to generate scale economies for both, the owners and the builders.

While no serious technical-in its strictest sense- innovation is involved, this type of application is novel and offers measurable savings in identifiable areas of the construction. These savings are important not only to the parties that order and build the ships, but also to the policy and finance sides which can plan ahead on basis of increased effectiveness and confidence.

If the matter of the replacement of the Greek Short Sea Fleet is seen as part of the overall strategy of Greece in the post cabotage era of the EU, a large number of such vessels are expected to be built. By keeping design effectiveness high and cost of building low, the goal of replacing a large number of such vessels in the immediate future becomes easier to reach.

The rest of this paper is organized as follows: The next section discusses the challenges opened after the abolition of cabotage in the EU and the acute problem of replacement of the Greek Mediterranean fleet. The sections that follow present a brief description of the generic ship and its subtypes, both from a technological and from an economics perspective and discuss the concept of semi-standardization in ship design. Finally we present the conclusions of the paper.

THE NEW CHALLENGES AFTER THE ABOLITION OF CABOTAGE PROTECTION IN THE EU

In the pre-cabotage liberalization Europe there has been a very strict protection regime in the entire Mediterranean region. Unlike in the North of the EU, where cabotage restrictions were lifted a long time ago, the waters of Greece, Italy, France, Spain and Portugal were closely watched for trespassing being reserved solely for vessels flying their own national flag. As a result of that, shippers' choice remained limited to a single flag, fleets remained stagnant in numbers and- worse- the urge to renew vessels in order to remain competitive was absent as a corollary to market seclusion.

Cabotage protection is in complete nonconformity with the EU provisions for freedom of movement of people and capital and everyone new that its demise was a matter of time. The removal of these trade barriers was expected to lead to interpenetration and a resurgence of the kind of competition that existed before the coasts were closed less than a century ago.

Though not without some problems, for Greek shipowners who trade in the Med, the removal of cabotage restrictions is a blessing as it opens to our Greek flagged ships a huge new trading area. In numbers it is hard to approximate it but it would not be too far off if we said that the potential "relevant " market for the Greek Med trader has now grown by a factor of twenty.

Greek tankers can now trade in Italian waters in the same way that Spanish bulkers can trade in Italy and Italian gas carriers can trade in France. The operators who will move faster will be the ones that will reap the benefits. We are pleased to report that we are experiencing a much more active presence of the Greek ships in other member countries than the opposite, and there are all sorts of signs that this is only the beginning. There should be no mistake though that all EU shortsea operators appear to have received the message and this matter is already showing on yards' orderbooks.

As matters stand at the moment, the Greek flag has the edge on the other national flags in the Med. This is already changing however with the entry of Cyprus and Malta in the EU. It is our conviction that this development will further enhance the presence of Greek shipowners in the battle for cargoes as a sizeable proportion of the Greek owned Med tonnage already operates under these two flags.

It is easy to imagine the boost in competitiveness expected by the Greek interests as a result of the Cyprus and Malta accession to the EU. On the other hand, it is unlikely that our competitors from France, Italy and Spain will not see the opportunities opening for their own vessels under these registers which-incidentally-make no provision for EU officers and crew. German owners have been old faithful to the Cyprus flag and we have little doubt that this opening will not be missed by the German K/G funds.

To the claim of a substantial part of this market redistribution by Greek interests there is a severe limiting factor. Our merchant fleet, as said earlier, is too old; there are some three hundred merchant vessels trading Med/domestic with an average age around thirty years [3]. As one can appreciate, these ships are less commercially attractive despite being economical to hire, are being penalized by high insurance rates and are under targeting by Port State Control authorities due to high age. There is therefore a huge scope of replacement by new ships. This has been the reason of creating the ESYAN.

If we remove ourselves from the competition for cargoes for a moment and reflect on how Greeks- or any other nationality for that matter- could become leaders in the Short Sea game, we would need to see:

- Fast, modern ships able to claim cargoes from the roads
- Double skin –also extending under the fuel tanks- to provide two stage pollution protection
- Efficient management companies to ensure proper running
- Competent officers and crews
- Direct access to cargoes to avoid multiple commissions on freight

For the moment we are confident about point number four and we hope that the achievement of point number one will automatically lead to improvements in our access to cargoes. Regrettably though, and in contrast to the Greek deep-sea sector, we are still far from having anything like efficient management companies. The companies here are small, family sized concerns which shy away from hiring high caliber professionals and are often unable to afford the purchase of sophisticated professional software which today is a must (see also the results of the yearly review of Greek Shipping published by Petrofin [4] which is ringing the bell on the continued reduction in the number of shipping companies operating small tonnage).

CREATING THE NECESSARY BACKGROUND FOR THE FLEET REPLACEMENT PROJECT

The logic

Trading small and medium sized ships in the Med is synonymous to narrow profit margins. This is a principal reason why ship replacement has been so difficult in the past. However, Med-sized vessels can now be built at a more reasonable cost due to the return of the Eastern European shipyards to the open market. These vessels can now be built in places like Bulgaria, Romania, Yugoslavia, Turkey, even Ukraine and Russia at a cost which is substantially lower than building in traditional Western European countries such as the Netherlands, Germany and Scandinavia. The cost reduction varies between 25 and 50% according to location. The main reason why this is so is the relative cheapness of wages and salaries in these countries in relation to levels of remuneration in the EU.

ESYAN (acronym standing for the Cooperation Committee for the Replacement of the Med Cargo Fleet in Greek) has been thinking of ways to reduce the building cost further by joining forces and placing bulk orders for ships to be built in series on behalf of its members.

The initial group of companies participating in ESYAN gathered among themselves twenty five ships of various types and sizes. Of these ships there is a clear cluster around the 6,000 dwt mark, albeit composed of vessels of quite different types. It soon became evident that no serious economies could be made if each member company ordered independently one or two vessels. On the other hand, there were declared intentions to build:

- Three cement carriers
- Two chemical carriers
- Three multi-purpose vessels
- Five products tankers

Or, in total, 13 hulls, all around 6,000 dwt.

There was need to find ways to build all these ships in series. We first put that question to a team of shipbuilders from a neighboring country. After studying it, they came back with the verdict that this business would create more problems than it would solve. We then put it to a reputable yard from the north, which also came back with negative advice. Third time lucky, we have asked ICEPRONAV of Romania [5] to look at this matter. They not only came up with an encouraging ‘yes’, but also with some very competently designed ships in the spirit of the concept.

The ESYAN recipe was based on three requirements:

1. Standardize ship parts and detailed design as much as possible.
2. Adopt same hull shapes regardless of cargo carried.
3. Engine rooms / Accommodations / Bows / Sterns /Propellers should be, to the extent possible, identical.

Figures 1, 2 and 3 show typical bow and stern shapes and engine room accommodations.

Figure 1: Typical bow shape

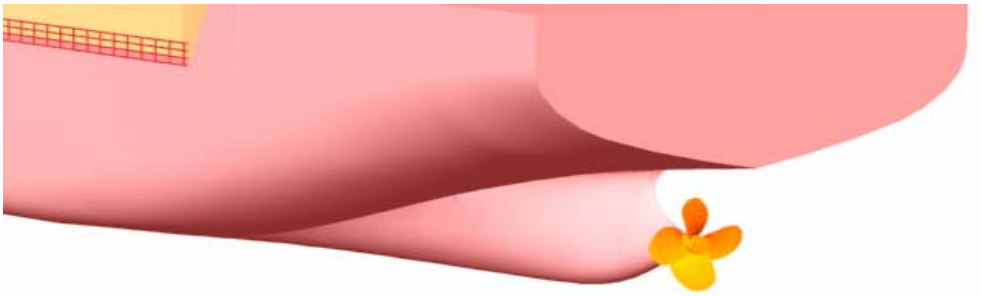

Figure 2: Typical stern shape

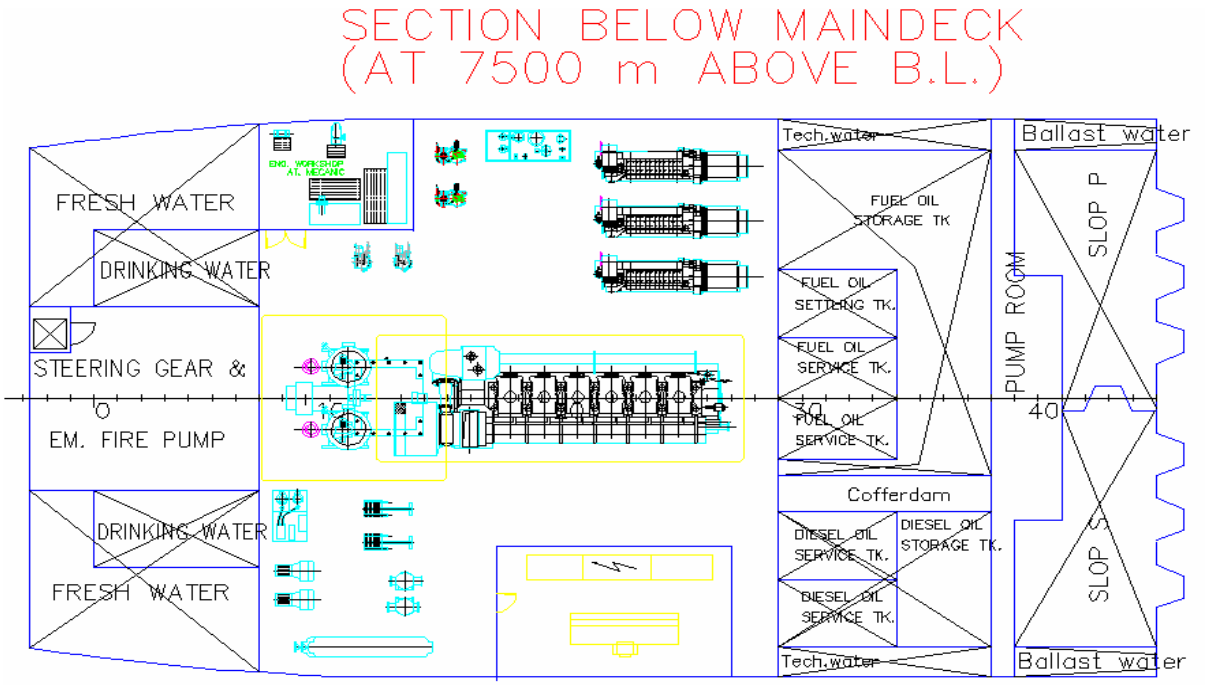

Figure 3: Typical engine room accommodation

Hulls suited to higher than usual speeds – in the region of 16 knots- were opted for, which could be attainable with a decent hull shape and a slightly larger engine than the one the majority of users would otherwise specify. These extra costs will be easily amortized by the superior performance of the faster sailing vessel under time charter calculations. Note that a faster vessel not only is able to cover distances faster, but it is a significantly better income earner throughout its commercial life while the additional cost is limited to its construction stage. The cost of higher fuel consumption of a larger engine is more than accounted for by savings in big cost elements which are payable per unit of time throughout the vessel's life (e.g. management overheads, insurance, debt amortisation etc).

The basic specification for *all* ships is as follows [6]:

- Size range: 6,200-7,500 dwt
- LOA range: 112-117 m
- Width : 18.2 m
- Summer draft: 6.15-6.80m
- 3rd generation bulbous bow/bow thruster
- Engine in gondola
- Speed range: 15-16 knots up to 6 force

- Full scantlings/No ice class
- Geared Main Engine driving a CPP

Though we have seen in the past long series of identical ships built in series, the best known being the T2s and the Liberty types during World War II, the SD14s and the Freedom three decades later, production design based on a common "platform" as seen in the automotive industry has not been a precedent. In this case, a double skinned hull of the above referenced dimensions emerges as a common platform for four different vessel types serving the following four distinct cargo categories:

- Chemical carrier
- Product carrier
- Bulk carrier
- Multi-purpose cargo vessel

Drawings of these types of ships can be seen in Figures 4 to 7. In spite of the difference in ship types, the similarity among these designs can be observed.

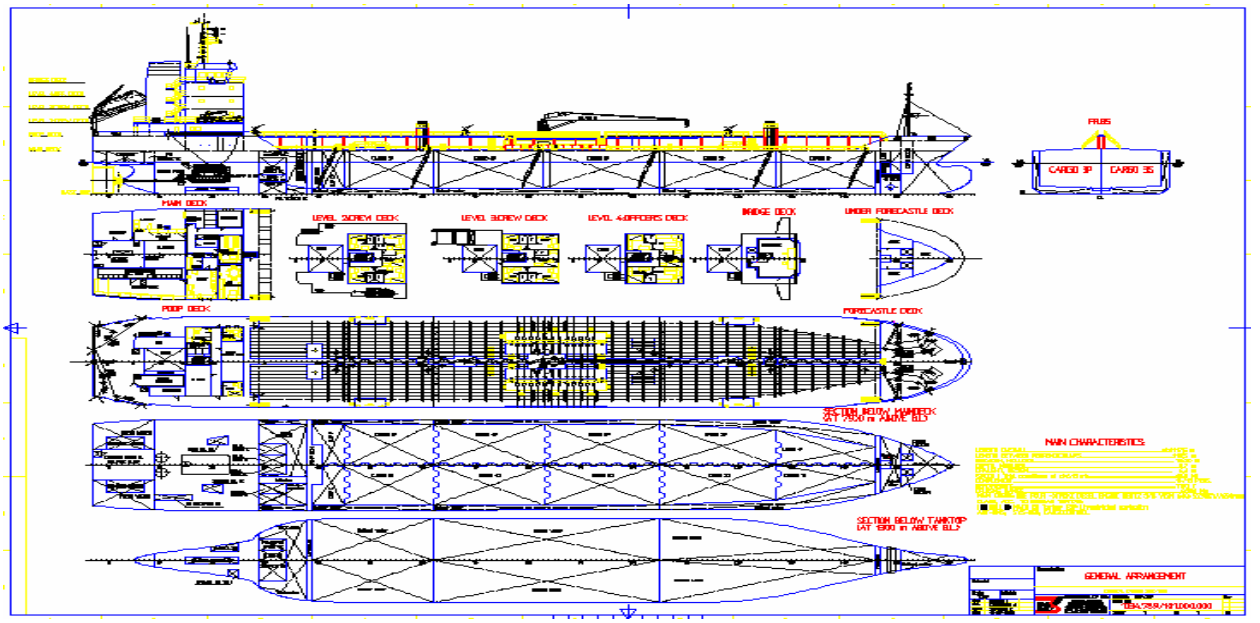

Figure 4: Typical Chemical Carrier

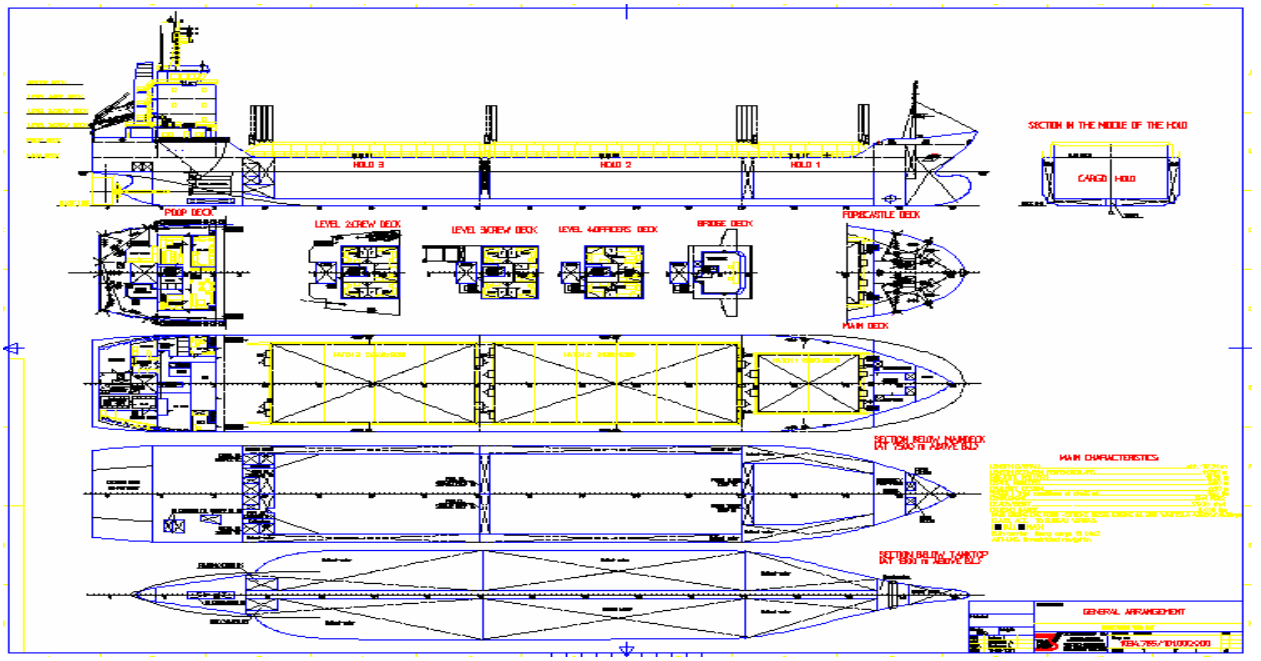

Figure 5: Typical Product Carrier

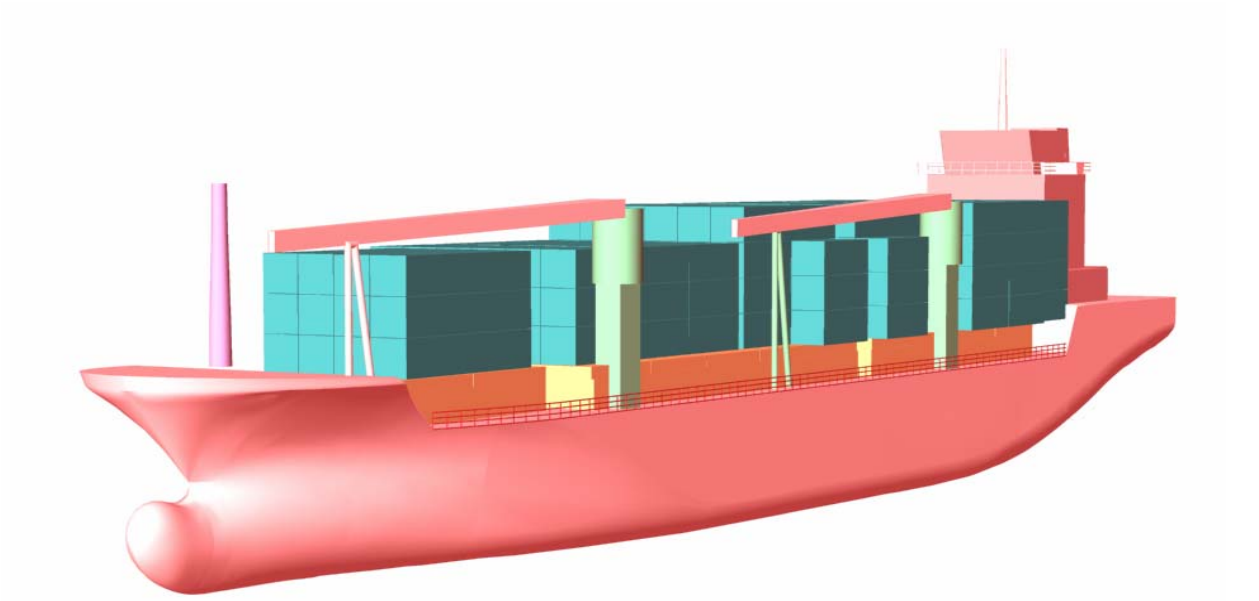
Figure 6: Typical Multi-Purpose Cargo Carrier

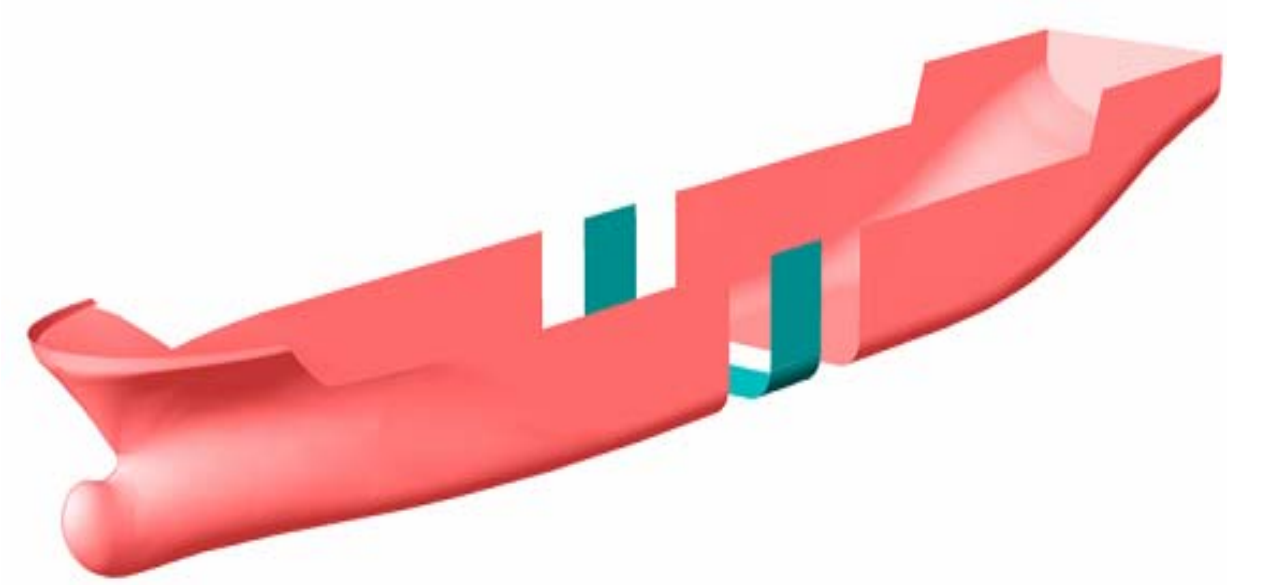

Figure 7: Possibility to accommodate different lengths

In view of research findings in the short sea sector one has to take into account the trends in ship size. Average size seems to have grown or is projected to grow as follows :

- 1977-78: 1,600 dwt
- 1987-88: 3,200 dwt
- 1997-98: 6,000 dwt
- 2007-08: 11,000 dwt (estimate)
- 2017-18: 20,000 dwt (estimate)

One can see that the average size of a European short sea vessel, which stood at just over 3,000 dwt in 1988, was more than twice the size of itself a decade earlier. The trend seems to continue as Crilley and Dean [7] and Wijnolst and Peeters [8] suggest average sizes 5,000 and 6,000 dwt respectively. This pan-European phenomenon has led the chairman of EEMFP to formally request the redefinition of the tonnage limits of the shipping unions in Greece to reflect the new actual sizes.

Though the concept of building such vessels as discussed in the next section does not materially change with vessel size, the matter has immediate implications on several other important matters such as quay drafts, length of jetties, size of consignment and commercial life of a newbuilding. This matter has also implications on the apportionment of representation of tonnage among the ship owners unions in Greece where there is a continuous drain of tonnage from the smaller to the larger unions. Whatever the outcome of discussions in this matter, there is no doubt that any rearrangement will have to take due account of the new realities which emanate from the creation of a single market after the abolition of cabotage in Europe.

Let us now to turn to the question of financing such a project.

The Financing

The production of Short Sea ships is a costly affair, especially if one bothers to compare per deadweight ton cost. To illustrate this point let us use a comparison between a popular sized short sea ship and another popular ocean going vessel. At the time of writing,

- For a gearless 6,000 dwt bulk carrier built in Yugoslavia today one can expect to pay circa USD 7.2 million, i.e. *USD 1,200 per dwt.*
- For a gearless panamax bulk carrier of 71,000 dwt built in Korea one would expect to spend

around USD 19.0 million i.e. *USD 267 per dwt.*
- The small ship costs four and a half times more per dwt.

The project of building one hundred short sea vessels to replace the aged ones would cost USD 720 million. The sum in itself – paradoxically perhaps- is not as much of a problem as it is the extensive ownership split. Bringing the interested parties together to arrive to the generic ship concept has been easy compared to the difficulties in persuading groups of Greek owners to join larger joint stock schemes.

The legislative framework for building ships in the EU includes the 7th Directive on Shipbuilding and the 1997 Guidelines on State Aids to Shipping. In view of these, banks and shipowners are obliged to work together in a rather strict regulatory framework. This kind of environment-which has successfully eliminated a sizeable part of European shipyards in the last three decades for the benefit of Far Eastern yards-does not render itself to undertaking of large projects. The options open to shipowners regarding financing newbuilding projects are as follows:

- Traditional bank loan finance.
- Finance/Insurance combinations.
- K/G type financing.
- Other types of government enhanced vessel financing.

Traditional bank financing would be the least desirable solution for two reasons. Firstly, it calls for a lot of money contributed by the owner (15-30% of the cost of the project in the form of equity) which needs to be paid early on, if not up front. In the example used the owner should be prepared to pay no less than one, perhaps two million dollars per vessel and – frankly- we do not know of many Med traders prepared to pay out of pocket this sum. Secondly, banks are not as keen to finance small investment projects as, for them, these cost disproportionately high in terms of staff time. Though still some years away, the implementation of the new Basel II Convention rules on financing is expected to add to the difficulties of straight bank financing.

Finance / Insurance combinations use the latter to increase the proportion of bank lending over and above a level the bank is prepared to finance alone, by guaranteeing the extended lender's risk. For example n such schemes, a 65% lending rate given by the bank can go up to 80% or slightly more. Though in principle welcome by owners, these solutions do not come cost-free. In fact, this type of mezzanine finance is quite expensive and would also require substantial up front expenses on the part of the owner.

The same is true regarding the *German K/G funds*. Other than being awkward in mandating ship management located in Germany and demanding 4% of the vessel's income as management fees, K/Gs are infamous in requiring payment of all sorts of fees by the owners. Though this option is open to those who would like to try it, it is hard to see any benefit for the Greek owner before ten years pass and the vessel becomes due for sale. It is then, and only then, that the owner can profit from buying back vessel from the K/G fund at a pre-agreed price and trade it, or, seek a profitable resale.

This leaves us with the various *government–enhanced forms of financing*. It is known that such systems are in operation in countries like France, Norway, UK, Spain, Denmark and other countries in the EU. The types of support are different but in general these schemes are trying to support local manufacturers and shipbuilders on one hand, while trying to make the building terms attractive to buyers and financiers on the other.

Buyers are attracted by higher financing levels, while the financing institutions are comforted by risk reduction mechanisms such as export credit guarantees. Italy alone has recently introduced an ingenious tanker withdrawal scheme for single skin vessels which trade domestically on environmental grounds, but this scheme cannot be considered as an investment support mechanism despite the obvious benefit to the owners of these ships.

Greece has not embarked on such schemes yet. ESYAN has been trying to explain the necessity for such forms of support and it is encouraging to see ministry and political leaders to respond in a positive manner. Greek owners have also been lobbying for a combination of assisted withdrawal of old tonnage of single skin ships

and government credit guarantees covering 25% of the building cost following the Italian line of thinking. (See also Italian Law 51 which has won the Commission's approval for the assisted withdrawal of old single skin tankers trading coastwise [9]).

The chain of events that have followed the sinking of the *Prestige* in 2002, causing the most extensive marine pollution incident in the history of the EU, will no doubt fuel the need for a large series of double skin tankers for the purpose of maintaining the EU 's supply of fuel oil at affordable prices.

The Business Options

One cannot fail to notice nevertheless that none of the above methods of financing construction of new ships is suited to the creation, for the first time in history, of the new European Short Sea Fleet. This new fleet will not only trade around the long European periphery but will also have to relieve the roads of the EU from the pressure of cargo traffic.

Important policy undertakings require extensive funding. We have seen mega sized funding in the context of the Trans European Networks but practically nothing for fleet renewal. It must be evident to those who come forward waving the flag of Quality Shipping that this cannot be achieved with single skin vessels in their third decade of life no matter how well maintained. European short sea is still replete of such ships.

The promotion of the EU initiative known as "Motorways of the Sea" will in the future bear fruit and there are already signs of member states starting to use their imagination in devising ways of combining three different items. Motorways of the Sea, Marco Polo projects and last, but no least, TEN funding.

ESYAN has been tasking itself to deal with the inconsistencies and shortcomings in European transport policy which in the past, as well as presently, has been trying to achieve high objectives without providing the necessary means. Regardless of how much a short sea operator desires to acquire and run modern ships, he cannot afford to risk bankruptcy as a result of embarking on a speculative fleet replacement project.

There is therefore a clear dilemma for the entrepreneurs of the sea; if they choose to stay with their existing tonnage they must be prepared to face the reality of technological obsolescence and commercial decline. If, on the other hand, they opt for a fleet renewal they will have to convince themselves –and the lending banks- of the viability of their decision bearing the risk of facing the consequences if proven wrong. Prudence here takes the form of hesitation, but the circumstances of a tightening Port State Control attitude towards older ships and charterers' assisted by regulation preference for modern designs in combination with phasing-out regimes call for swift decision making.

The EU Council of Ministers after deciding on measures after the *Prestige* accident, ought to have tasked the Commission to come forward with ideas on *how* a new fleet of fuel oil carriers could be created within a span of, say, 6-10 years. If funds were not available, for example, it would help telling charterers of such tonnage that they should offer ten year time charters to such new tonnage to ensure repayment of debt providing them with tax and/or other incentives. We have yet to see this kind of approach.

Going It Together or Staying Alone?

In view of the above the entire burden for resolving the matter falls on ship owners. In Greece this sector presently consists –as earlier said- of small and medium sized operators. It might help examining briefly why these operators have stayed small. In brief,

- Profit margins have stayed narrow for a long time. Ships have been expensive to build and earnings have been covering costs with relative difficulty. Older vessels have been cheaper to acquire but are vulnerable to staying without employment between successive charters in the open market. Newer vessels have been better in ensuring continuous employment while staying young, but have had to accommodate debt repayment within charter rates which were not very different from rates obtained by older vessels. The concept of Quality Shipping as first instituted by Commissioner Kinnock in the 1990s has virtually been left to its fate by the Commission despite a

myriad of references in speeches of its employees.

- Bank credit has been expensive and tight. Banks have traditionally seen this sector with suspicion. As a result, only a small number of banks have been involved in financing second hand purchases and even fewer in newbuilding construction (hence the advent of K/G funds in Europe the last twenty five years or so). The convention known as Basel II is going to make things worse as banks will have specifically to include in the cost of providing funds a risk premium [10].
- Period charters have been few and far apart. The strength of charterers in negotiations has manifested itself in short term gains at the expense of owners. In the longer run however this has developed into a major headache for both sides as ship replacement has become very difficult and the presence of modern tonnage scarce. Here again, the market has failed to do what in theory it is promising to do.
- Greek owners loath getting together. Evidence has shown them to prefer leaving the market rather than joining forces to cut costs and gain access to cheaper and adequate financing [4].

During contacts with finance experts and ship financing institutions it has become evident that joining forces among small and medium sized shipping companies is going to become necessary in the context of fleet replacement despite voices in flavor of the joys of independence. ESYAN is presently working on alternative schemes which will be discussed and evaluated by its members in order to reach a minimum critical size that will be able to afford newbuildings and –ultimately- survival.

SEMI-STANDARDIZATION IN SHIP DESIGN

Semi-standardization in ship design is being discussed here as:

- a vehicle to stronger ships and long hull and machinery warranty periods.
- a guide to higher environmental standards for commercial vessels
- a basis for planned ship/port (terminal) interface

Semi-Standardization as a Vehicle to Stronger Ships and Long Hull and Machinery Warranty Periods.

By the term semi-standardization we denote the practice of standardizing ship design and fittings across ship types to the highest practicable level in order to achieve certain objectives.

Ship safety is probably the first consideration that springs in mind. We have all experienced in the recent past ship designs that have been termed as “minimum scantlings”, or “zero tolerance” which are indicative of overdoing it in design optimization. This practice, taken together with two other parameters, namely the need to build cheap so the yard can sell, and, one-off designs which do not allow for improvements incorporated in serially produced capital goods, has led to problematic vessels and (less so) engines. The debate in IMO on bulk carrier safety is a good example of the seriousness of consequences of design failures.

The responsibility assumed by those involved in designing, supervising, approving and building ships has remained surprisingly low when compared to the liability of producers of other means of transportation such as auto makers and airplane manufacturers. This matter is in sharp contrast to the consequences of failure, as *Erika* and *Prestige* have recently taught us. Building one-off designs is a great contributor to the uncertainty of the designer/manufacturer/classifier about the behavior of the product under severe circumstances and/or over time. That in turn transpires into hesitation to offer warranties worth talking about to the end user.

The excessive rises in compensation for victims after accidents involving hull failure and/or pollution are pressing for change in this matter. It is unacceptable for car bodies to offer warranties against damage and rust for up to twelve years, while ships’ hulls costing 1,000 times as much to offer just one year. Shipbuilders and classification societies have so far escaped conviction

for contributing to or causing marine accidents. This, however, does not mean that borderline strength ships built on untried designs can be produced and sold forever escaping blame.

Ships, regardless of their size, should carry a warranty against hull failure not consequent to casualty of at least fifteen years, and builders should find the way of insuring themselves against this risk. Ways of implementing this matter have been discussed in the recent past by major bodies involved in shipping policy and we shall not be surprised to see this as a future requirement of the EU in case IMO decides to continue ignoring it.

One of the ways of increasing the confidence of those involved in construction of hulls is semi-standardization as it provides the opportunity for continuous product improvement. It is particularly gratifying to see IACS and IMO moving towards acceptance of the proposal for uniform standards of construction for new ships, although the ideas are not quite as advanced as the ESYAN approach yet.

Semi-Standardization as a Minimum Acceptable Environmental Standard

Semi-standardized production gives an opportunity to all parties concerned to incorporate in the design a uniform standard of environmental protection applicable to all vessels in a series.

As a start this uniform environmental standard can include –as in the case of ESYAN designs- some highly desirable features for owners, charterers, insurers, flags and regulatory authorities.

- Double skin hull
- Protected fuel tanks
- MARPOL Annex VI low emission engines
- MARPOL Annex III sewage equipment
- Closed loading/Vapor return lines(for tankers/chemicals carriers)
- Improved levels of redundancy in steering and propulsion.

There is flexibility to extend this framework to include a higher specification such as propulsion redundancy.

Semi-Standardization as a Basis For Planned Ship-Port (Terminal) Interface

Last but not least, semi-standardization can provide substantial benefits as regards the planning of ship-port terminal interfaces.

It is widely accepted that there exists a very broad variety of ship-port (terminal) interfaces within the shortsea Mediterranean trades, especially if one extends these to the Black Sea and non-EU Med countries. This variety concerns not only the geometric characteristics of the port, but also extends to shoreside cargo handling equipment and links to other transport modes.

The development of a semi-standardized type of shortsea vessel is expected to (at least partially) alleviate problems associated with harmonizing port interfaces in the future. Of course, one would certainly not expect one type of interface, common for all types of ships falling under the common design umbrella, but only a manageable number of few standardized types, each able to accommodate a specific ship category.

As in shortsea and intermodal transport the ship is but one element of the door-to-door intermodal chain (and this is true not only for unitized, but also for bulk trades), we think that *ship-port interface design* should go hand-in-hand with *ship design*, and in fact the former is a mandatory extension of the latter. Otherwise, the benefits of the new design would not be fully exploited.

CONCLUSIONS

We may have come a long way these past few years in our understanding of the problems associated with moving traffic from land to sea, and in fact we have even achieved some progress in specific cases. We feel we still have a long way to go, but we hope that this paper will move us in the proper direction.

Semi-standardization around certain vessel sizes can offer substantial operational advantages and construction savings the magnitude of which though still remains to be accurately quantified. It can also help those involved in policy to design infrastructure works

to measure thereby offering better utilization and improved cost effectiveness. It is the wish of the authors that more research is conducted in these areas which offer themselves to department- coordinated postgraduate work.

Environmental protection has also a lot to gain from semi-standardized practices as it becomes easier –and cheaper- to incorporate minimum acceptable standards. For the owners of the vessels there are clear gains in way of good chances to ask and obtain long-term guarantees from hull builders, engine makers and equipment manufacturers. At present they have just one-year warranty periods, which is inadequate when compared to cars and trucks.

The free movement of community flagged vessel in the previously cabotage protected waters of the Member States has created an entirely new environment the potential and opportunities of which few people have fully grasped yet. There is little doubt that adjusting to the new realities will take years. Owners, organizations, governments and EU institutions should gear themselves to efficient solutions to be able to stand up to the challenges of times.

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