OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

09109

Distr.
LIMITED

ID/WG.285/18
29 May 1979

ENGLISH

United Nations Industrial Development Organization

Sub-Regional Workshop on Shipbuilding, Shiprepair and Design for Mediterranean Countries

Valletta, Malta, 23-27 April 1979

REPORT*

*This report has been reproduced without formal editing.

id. 79-4741

CONTENTS

INTRODUCTION

The Sub-Regional Workshop on Shipbuilding, Shiprepair and Design for Mediterranean Countries was held at Valletta, Malta, from 23-27 April 1979. The Workshop, organized by the United Nations Industrial Development Organization (UNIDO) in co-operation with the Government of Malta, was the result of a visit to Malta by the Executive Director of UNIDO in June 1977 and of the recommendations of a UNIDO mission to Malta in October 1977.

The objectives of the Workshop were: firstly, to bring together participants from developing countries of the Mediterranean area and participants from developed countries, research and development institutes and maritime consulting firms having experience in the field of shipbuilding, shiprepair and design to discuss problems and goals; and, secondly, to promote co-operation between developing countries of the sub-region in the field, especially as regards the techno-economic aspects and local conditions. The list of participants and observers is in annex I. The background and country papers distributed at and presented to the Workshop are listed in annex II.

The Workshop made recommendations for regional and international co-operation in the areas of collection and distribution of information, training, marketing and design. The need for regular meetings between the developing countries of the Mediterranean area was stressed.

I. RECOMMENDATIONS

The Workshop recognized the importance of greater co-operation between developing countries in the sub-region. After extended discussions, the Workshop agreed upon a recommendation for co-operation under four main headings. Country representatives were asked to apply at the government level for any necessary UNIDO technical assistance. Co-operation was recommended as follows:

1. Collection and distribution of information

(a) Participating countries should, as a priority, agree to organizational arrangements whereby delegates can meet formally at regular intervals - every six months for example;

(b) Participating countries should establish a "Mediterranean Maritime Centre" to serve as a data collection and distribution centre and to act as a forum for co-operation;

(c) To avoid unnecessary duplication of facilities, the "Mediterranean Maritime Centre" should initiate studies to determine:

Number, capacities and capabilities of facilities within the sub-region which build and repair ships, machinery and components

Developments which are now taking place

Planned future developments

Information which becomes available as a result of (b) and (c) should be included among the items discussed at the regular meetings referred to above and the conclusions should be referred to their respective Governments as appropriate.

2. Training

Within the sub-region, those countries which have the capacity and capability to train shipbuilding and/or shiprepairing personnel should receive personnel for training from countries which do not have the requisite training facilities.

3. Marketing

Following the formation of the "Mediterranean Maritime Centre" described in 1(b), a sub-regional marketing group should be formed to ensure that orders originating within the sub-region are placed within the sub-region where possible.

4. Design

(a) Participating countries should investigate the possibility of reducing costs of production by adopting a greater degree of standardization;

(b) Participating countries should unify their interpretations of IMCO criteria on maritime safety and marine pollution prevention and statutory requirements.

Offers of assistance were received from delegates from developed countries who were attending as observers.

II. ORGANIZATION OF THE WORKSHOP

The Workshop was held under the auspices of UNIDO and the Government of the host country, the Republic of Malta.

It was attended by 61 delegates from 7 developing countries of the Mediterranean sub-region, from 9 developed countries who were acting as observers, and from UNIDO and IMCO.

Mr. F. Spiteri (Malta) was elected Chairman; Mr. P.E. Hectorides (Cyprus) and Mr. Y.M. Hashem (Egypt) Vice-Chairmen; and Mr. J.L. Peach (United Kingdom) Rapporteur of the Workshop. Participants had before them the report "Recent Experience and Prospects for the Development of Shipbuilding and Repair in Developing Countries", prepared by the maritime consultants appointed by UNIDO, Terminal Operators Limited of London.

At the opening session, statements were presented by the Hon. Wistin Abela, Minister of Development, Energy, Port and Telecommunications, Republic of Malta and by Mr. J. Cyranski (UNIDO).

Mr. Abela welcomed delegates to Malta and gave a brief account of the achievements and aspirations of his country in shipbuilding and shiprepairing. He went on to emphasize the importance of seeking and pursuing possible avenues of co-operative effort, which would benefit the sub-region as a whole. Mr. Abela drew attention to the opportunity presented by the Workshop itself for enhancing reginal co-operation in the shipbuilding and shiprepair industries. Mr. Cyranski emphasized the importance of the shipbuilding and shiprepair industries to the developing countries in the sub-region and also drew attention to the opportunities for co-operation afforded by the Workshop.

In the course of the Workshop visits were made to Malta Drydocks and the Marsa Shipyard Project of the Malta Shipbuilding Company.

III. REVIEW OF WORLD SHIPBUILDING AND SHIPREPAIR CAPACITY AND MARKETS

Prior to 1974, there was a continuously growing demand for ships in response to expansion in world trade. This encouraged both the developed and developing countries to increase their shipbuilding capacity. The situation changed dramatically in 1974.

While 1973 had been a boom year, it was becoming clear that growth could not continue at 1972 and 1973 levels. Inflationary pressures were already apparent in the industrialized world - shortages of raw materials, equipment and skilled labour for example. The quadrupling of oil prices by the producing countries intensified the problems of the industrial world and caused balance of payments deficits for the oil-consuming countries as against the producing countries. The net result was an almost unprecedented deceleration of growth and a reduction of demand and employment in industrialized countries. Shipping demand, which had risen by 17.3% in 1973 in ton-mile terms, rose by only 4.7% in 1974 and decreased by 7.1% in 1975 as compared with 1974, bringing it back to approximately the 1973 level.

While the oil price increases had an almost immediate effect on the demand for sea transportation, the supply situation could only be adjusted over a much longer period. Although levels of demand in 1973 and 1975 were similar, the total tonnage available in 1975 was about 22.5% higher than in mid-1973. The over-supply situation in mid-1975 was compounded by the fact that ships under construction and on order (4,798 ships totalling over 102 million dwt 1/) represented a further increase of 29.9% on the existing world fleet. Oil tankers under construction and on order in mid-1975 would have increased the existing oil tanker fleet by 44.8% if some owners had not been able to cancel orders or replace them with orders for other ship types, notably bulk carriers.

In October 1974, 154 ships of all descriptions totalling 2.04 million tons deadweight were laid up. By October 1975 this number had increased to 633 ships, with a total deadweight of 39.79 million tons. World tonnage laid up has fluctuated between a low of 27.41 million deadweight in March 1979 and a high of 57.01 million deadweight in July 1978. In addition to laying up their ships, measures which have been taken by shipowners to alleviate the oversupply situation include slow steaming, accelerated scrapping, cancellation of orders, carriage of part cargoes and transfer and conversion of existing tonnage to other purposes.

1/ Deadweight tonnage.

While owners are having to resort to these measures in order to maintain employment for existing ships, there is clearly little incentive for them to place orders for new vessels. The world shipbuilding order books are now at their lowest level since 1965 and shipbuilding capacity, which was substantially increased during the late 1960s and early 1970s is now greatly in excess of demand. It is estimated that world total shipbuilding capacity, in terms of compensated gross registered tonnage,2/ is approximately 20 million tons. Figures for estimated world newbuilding demand vary, depending on source. The consensus of opinion is that it will be between 11.5 million and 13 million compensated gross registered tons in 1980. On this basis, capacity is in excess of demand by between 35% and 42%.

Participation by developing countries in the carriage of maritime cargoes, and hence the requirement for ships, is likely to increase substantially in the near future. The United Nations Conference on Trade and Development (UNCTAD) Liner Code, which has a cargo-sharing provision - the so-called 40:40:20 Clause whereby countries will be entitled to carry 40% of the liner cargoes which they export and import - will probably be accepted in some form, though not necessarily in its entirety. UNCTAD V will consider a proposal to seek "recognition of the rights of developing countries to an equitable participation in the carriage of bulk cargoes generated by their own trade and agreement on the measures needed for the implementation of those rights". These policy recommendations were on the agenda at the Fifth Session of UNCTAD held at Manila on 7 May 1979. The theoretical potential for developing countries to expand their fleets under the protection of flag-preference and cargo-sharing agreements is enormous. It is to be expected that those countries which expand their merchant fleets may be predisposed to seek to build and maintain their ships in domestic yards thereby generating employment and conserving hard currency. At the moment, however, approximately 86% of the world's shipbuilding capacity is in 13 developed countries. Developing countries who expand their shipping industries may also expand their ship-repairing and shipbuilding industries.

The situation in the shipbuilding industry is therefore a complex one. Many shipbuilders in Western Europe and Japan are now in apparent agreement that capacity should be reduced by about 35% over the next two to three years. Reductions have already commenced in some countries, including Japan. Developing countries who established their shipbuilding industries during better times, e.g. Brazil and the Republic of Korea, are now in a position to compete with many shipyards in developed countries and have full order books. They are

---

2/ Compensated gross registered tonnage is gross tonnage multiplied by a coefficient which reflects the work content and value of a given ship type and size.

reluctant to reduce capacity, particularly since they are in the process of expanding their merchant fleets.

Developing countries that have little or no shipbuilding capacity are faced with two main alternatives: either to import ships from established yards thereby omitting the creation of new employment opportunities for their labour forces and also spending hard currency; or to expand capacity and build ships at home in the knowledge that, initially at least, those ships are likely to be substantially more expensive than similar imports. In the latter case, help will probably be required from developed countries to provide skills, technology and money to some extent and this also will cost hard currency.

There are some 1480 operational drydocks, floating docks and slipways throughout the world. A further 17 are under development but were not operational at end-December 1978. Of the latter, 10 are designed to accommodate ships of 150,000 deadweight or above. Competition between repair facilities tends to be geographically local and not international as in the case of shipbuilding. Shipowners will normally use facilities which are close to, or en route to, their normal ports of call. A viable shiprepair industry can be based on a geographical advantage - proximity to a busy trade route or port for example - and need have no connection with the national requirement for ships. Nevertheless, there is a risk of overcapacity in the repair sector in various regions due to development of new facilities and to switching of facilities from newbuilding to repair work as a means of obtaining work.

IV. PROSPECTS FOR SHIPBUILDING AND REPAIR IN MEDITERRANEAN DEVELOPING COUNTRIES

Despite unfavourable market conditions, several countries in the sub-region have identified a need for shipbuilding and repairing capacity to service their own fleets, existing and planned. Other countries of the sub-region have already established industries and are faced with the problem of obtaining sufficient employment to make them viable. There is a real need for co-operation between developing countries of the region to avoid unnecessary duplication of facilities and to use the resources that are available to the benefit of all.

Areas for co-operation need to be identified. Projects should not be too ambitious initially to ensure that they have a reasonable chance of success. In Denmark, experience has shown that rationalization of capacity and a uniform approach to production methods provide a good basis for co-operation which may subsequently lead to co-operation between yards on marketing and on research and development. For example, working groups were formed to standardize methods of constructing vessel accommodation. This resulted in an improvement in quality. The ability to refer to a standard with which owners were familiar became an asset when ships were being marketed. Production of items of equipment (hatch covers or davits for example) to a common standard could form a basis for co-operation in the Mediterranean sub-region which might eventually provide opportunities for co-operation in marketing and in sharing of orders.

Developing countries in the Mediterranean sub-region generally lack design experience and expertise. Changing market conditions and political pressures often mean that there is very little time for the development of new designs. Countries which do not have design expertise, therefore, need to rely on the developed countries to supply designs. Similarly, changes brought about by product development and competition mean that shipbuilders will have to be more adaptable in the future. One way of coping with change is through research and again the countries of the sub-region, with the exception of Greece, lack research facilities and expertise and need to rely on the developed countries to provide these.

Although developing countries of the sub-region have plentiful labour supplies, some have a shortage of skilled labour and require assistance with training. This is an area which offers considerable opportunities for co-operation. Several countries of the sub-region have considerable experience in shipbuilding and shiprepair and are well equipped to train personnel either in training schools or in the yards.

Countries of the sub-region that are now executing or planning developments in the shipbuilding and shiprepair sectors face a number of problems, particularly in respect of research and development, design and skilled labour availability. These problems lend themselves to solution through regional co-operation or through co-operative joint ventures between developed and developing countries. The concept of co-operation, however, implies that one country has a surplus and one a deficit in certain respects. A major prerequisite for co-ordinated action therefore is to identify where surpluses and deficits exist so that exchanges can be made which will benefit all concerned. The outcome will inevitably be a compromise and it is the responsibility of the participating countries to achieve that. The Workshop undoubtedly contributed to a better understanding of opportunities for, and limitations on, the expansion of shipbuilding and shiprepair in some countries. While opportunities do exist for expansion of these industries in the sub-region, the risk of unnecessary duplication of facilities in adjacent states is apparent and steps need to be taken to ensure that this is minimized.

V. SUMMARIES OF COUNTRY PAPERS

Algeria

As a result of its geographical position, Algeria has played an important role in maritime affairs since the beginning of the 19th century. Due to colonization, Algeria's maritime industry has not developed as in other countries.

At independence, shipbuilding was limited to wooden ships and a minimal infrastructure permitted repair work of a craftsmanship nature only.

Within its future programme, Algeria has concentrated on developing merchant and fishing fleets and on creating the necessary infrastructure for newbuilding and repairs. Feasibility studies started in 1968 and aimed at assessing the market potential for Algeria envisaged that creation of a shipyard would be viable. In 1970, a contract was signed for feasibility studies for a shipyard at Mers-El-Kebir. These studies are now in progress and work on the shipyard is scheduled to start in 1980.

Difficulties have retarded the development of the shipyard. The delay has enabled Algeria to overcome some problems, particularly with regard to training. A naval shipbuilding school has been established since 1977. The training school has 133 people in the design office and 600 people in production services. Training is carried out within the framework of production. In 1977 the training school produced shrimp trawlers, motor boats and barges. After initial training in the shipyard, managers and workers are sent abroad for further training. The school has acquired a reputation in the field of shipbuilding and provides a pool of qualified personnel.

The development of marine industries relies on foreign help and co-operation. It is intended to reduce the reliance on imports for ship construction by using the potential of Algerian industry.

The proposed new shipyard is designed for flexibility and diversity of production. It will be used for newbuilding and repairs.

In the first phase of construction the shipyard will be technically adapted to carry out repairs on all types of ships up to 54 metres long and maximum weight 850 tons. In the second phase, after setting up a crane with 800 tons lifting capacity, the shipyard will be technically adapted to build gas carriers up to 125,000 m^3. Additionally, the shipyard will manufacture up to 770 tons of equipment for ships annually.

The annual programme of production is only a basis which has been used to establish principal technical parameters for the work areas of the shipyard and the requirement for machinery and labour. In practice, production will differ each year to adapt to shipowners' demands for types and numbers of ships.

In addition to fully-equipped work areas, there will be auxiliary services for storage and for the social and administrative requirements of the production programme.

The principal work areas are:

Dry dock - 280m x 48m x 8m

Syncrolift - 1,000 tons lifting capacity with 5 work berths for erection and repair

Quays for fitting out and for unloading

Workshops and areas for:

- Plate preparation
- Prefabrication of hull sections
- Cleaning and painting
- Erection of the hull
- Storage and warehousing
- Energy sources (compressed air, electricity and heating
- Auxiliary services (administration, canteens, medical, reception and parking)

Work stations will be equipped with the most modern machines of the highest quality.

In the first phase 3,855 people will be employed. In the second phase, this will be increased to 4,780 people of whom 3,890 will be workers and 890 managers.

Shipbuilding will take place in the dry dock or on the Syncrolift. Repairs will take place on the Syncrolift and on the fitting out quays.

Cyprus

The geographical position of Cyprus makes it a most favourable location for shiprepair and shipbuilding facilities. It is only during the last 2 years, however, that such activities have been established. The following figures are extracted from official statistics:

Shipbuilding and repairing

Year	Employment	Gross output	Value added	Capital formation
		(in Cyprus pounds 3/)		
1973	42	41,000	26,000	
1975	14	49,000	10,000	
1976	13	32,000	16,000	
1977	117	1,434,000	343,000	494,000
1978	157	2,021,000	519,000	214,000

The lack of availability of any substantial indigenous raw material and other resources has led the Government of Cyprus to set as one of its targets for the 3rd Emergency Economic Action Plan, 1979-1981, the establishment of industries based on highly skilled and educated manpower, especially in the field of engineering industries. Shipbuilding and shiprepair yards are ideal candidates in meeting this target as their success depends largely on high technical skills. The creation of a ship-repair facility in Cyprus is expected to create a need for the faster expansion of various ancilliary industries, thus contributing to the more general economic development of the island.

The most promising and immediate potential demand for shiprepair facilities in Cyprus lies in ships calling at its ports, particularly those calling regularly, and to a lesser extent ships calling at other Eastern Mediterranean ports and transiting the Suez Canal. It is estimated that, by 1980, a gross potential market of 250 frequent callers, 1,300 occasional callers, 1,500 passing ships, and 13,400 ships transiting the Suez Canal will exist among ships of under 14,000 deadweight. From this gross potential market a very firm market exists for a repair centre to handle ships of 6,000 deadweight and less, with an expected market of 150 vessel dockings per year by 1980. Between 6,000 deadweight and 14,000 deadweight the market falls off, with an estimated market of 50 vessels per year in 1980. Above 14,000 deadweight, only a small market exists.

Shiprepair in Cyprus is mainly undertaken by 2 specialized companies namely: Eastern Mediterranean Shipyards Ltd. and Famalift Shipyard Co. Ltd., both situated in Limassol.

3/ During the period covered the value of the Cyprus pound was about $US 2.80.

Eastern Mediterranean Shipyards (E.M.S.) was established in June 1976 and began operations in April 1977. The personnel at the yard number about 75 persons. The yard is well equipped to perform a variety of machinery, electrical, electronic and hull repair work on board ships which do not require drydocking. The firm carries out specialized repairs by importing specialists, know how and supervision from Western Europe. E.M.S. has service contracts with Storke Workspoor, M.A.N., M.T.U., K.M.W., Burmeister and Wain, and Sulzer.

E.M.S. also accepts newbuilding contracts for smaller craft such as patrol boats, customs and police launches, pilot vessels, sightseeing launches and the smaller tugs, barges and pontoons.

Lack of space and of wind and wave protection precludes enlargement of the shipyard, at its present site, at reasonable cost.

The company has repaired more than 180 ships since it commenced its activities in April 1977.

Famalift Shipyard Ltd. was established in February 1974 and is the only shiprepair firm in Cyprus that owns a floating dock. The dock has a lifting capacity of 1,400 tons (light ship) and internal dimensions of 64 metres length and 18.4 metres width. Lifting capacity will be increased to 2,500 tons in the 2nd stage of construction. For the first stage a travelling crane is provided on the top of one of the walls. The yard currently employs about 85 people.

More than 60 ships have been docked for repairs since the dock was completed in March 1978.

In addition to its location, Cyprus offers the following:

A well educated and adaptable labour force

Lower labour costs than those prevailing in Western Europe

Service industries (banking, telecommunications etc.) which are developed to European standards

A liberal import policy with respect to machinery and raw materials

It is accepted that the establishment of a shipbuilding and shiprepair facility is not an easy task, despite the favourable factors described above. A number of constraints exist, the major one being the availability of labour trained in the particular skills required. A number of existing institutions, the Higher Technical Institute and the Cyprus Productivity Centre, for example, have as their major task the training of workers and technicians. They will have to be strengthened and expanded if they are going to make a contribution to the shiprepair and shipbuilding industry. It may well be that, at least initially, a large part of the required training, at all levels, should be carried out abroad, for example in European shipyards.

The absence of any naturally protected areas against waves and underwater currents and of adequate water depths presents the necessity that any shipyard to be established should be incorporated within a port. The existing ports of Limassol and Larnaca are ideal for this purpose. Unfortunately, however, they must be ruled out as potential locations for shipyards because of their limited size and their rapidly expanding requirements for space due to increasing traffic. A new shipyard, therefore, would have to be located on virgin land with consequent increase in investment costs or at the expense of other forms of development, such as tourism. In view of the above, the idea of establishing a new port in Cyprus and of incorporating a shipyard within it is gaining widespread support. Paphos and Vassiliko have been put forward as possible locations.

The problems of training, accessibility to sophisticated technology and high investment costs (estimated at $US 30 million for a shipyard capable of handling ships up to 7,000 GRT 4/ covering 90% of the market potential) have led the Government of Cyprus to the conclusion that the best approach for the establishment of shipbuilding and shiprepair facilities would be through a joint venture with a foreign, experienced partner.

Various studies carried out recently have indicated that a large shipbuilding and shiprepair yard in Cyprus would be a viable proposition. The problems associated with the establishment of a shipyard in Cyprus, though not insurmountable, cannot be underestimated. Their careful consideration may lead to a well-balanced, phased development of a shipyard in Cyprus.

4/ Gross register tons.

EGYPT

As a result of regular increments in the volume of external Egyptian trade, the Government of Egypt decided, in 1956, to develop the Alexandria Shipyard. The Port Said Shipyard was established in 1960. These shipyards provide Egyptian national fleet with the required ships. From 1956, the shipbuilding industry has been considered one of the most important strategic industries in Egypt.

Egyptian yards are still following the package deal system for building ships whereby a large percentage of the materials and equipment required for building ships is imported. Additionally there is a requirement from foreign shipyards for designs and expertise for the building of large ships.

The Egyptian shipyards are already able to build cargo ships to international standards of quality. A series of locally-built ships with different capacities have already joined the Egyptian fleet. Those ships have been fully accepted by the international classification societies and have proved to be satisfactory to the shipowners.

Egypt's geographical situation at the centre of the world's seaborne traffic to and from the Far East means that the prospects for shiprepair works are good. The Port of Alexandria is the most important Egyptian port on the Mediterranean Sea. Port Said and Suez are equally important because of their locations at the entrance and exit of the Suez Canal.

Shiprepair work in Egypt is profitable, provides a good source of foreign currency for the country and is competitive in terms of quality and price.

There are numerous facilities for shipbuilding and shiprepair in Egypt. The most important ones are described below.

Alexandria Shipyard. The most modern shipyard in Egypt, located in the sheltered anchorage of the western harbour of Alexandria. The shipyard covers an area of 400,000 m^2 in addition to one kilometre length of fully equipped quays which are available for both repairs and fitting out work. The yard is designed with 70% of capacity intended for shipbuilding and 30% for repair.

Workshops at the shipyard cover the following activities: hull processing including shot blasting and automatic gas cutting using numerically and optically controlled machines, assembly and welding of components and sub-assemblies, erection, outfitting, mechanical and electrical pre-mounting and testing prior to final erection on board, piping, painting and insulation, woodwork, machining and forging, foundry work, galvanizing and metal coating.

The shipyard has two inclined building berths each 180 metres in length and 28 metres breadth, equipped with 6 portal cranes of 30 tons each. The berths have facilities for building ships up to 30,000 deadweight. Additionally, a mechanical slipway area can be considered to be a completely independent yard for building small ships up to 1,000 deadweight.

Shiprepair activities are concentrated on 2 graving docks with the following specifications:

	Length	Breadth	Depth	Craneage
Dock No.1	263 m	39.6 m	9.5 m	1 x 30 tons +1 x 10 tons
Dock No.2	158.5 m	18.9 m	6.4 m	1 x 16 tons

Docking facilities are provided for ships up to 10,000 deadweight in No. 2 dock and for ships up to 85,000 deadweight in No. 1 dock. The facilities and skills available enable the yard to undertake any repair jobs, survey work, regular hull or engine servicing and damage repair.

Repair work can also be undertaken on a quay of about 1,000 metres length served by two 30-ton travelling cranes and one 25-ton tower crane.

Alexandria Shipyard is an authorized repair service centre and spare parts supplier for Burmeister and Wain, Denmark.

In addition to the facilities mentioned, the shipyard has a training centre with fully-equipped shops and classrooms provided with the most modern means for teaching 20 different specialities. About 250 workers graduate annually. The shipyard also has modern laboratories capable of undertaking mechanical tests, radiography and non-destructive tests, metallography, chemical tests, spectrographic analysis, repair and calibration of measuring and control instruments. Specialists at the welding laboratory select and test new techniques and materials for welding and are also responsible for carrying out the periodical examinations of the yard's welders in accordance with classification society requirements.

The yard relies on its own energy sources for steam, compressed air, oxygen and acetylene.

Total workforce is about 6,400 people and capacity is currently geared to a total of 52,000 deadweight production annually. This will be increased to 100,000 deadweight within 5 years as production of a 13,000 deadweight (Ro-Ro) multipurpose type of ship is developed.

The yard's production to date includes:

A series of 13,740 deadweight general cargo ships

A series of 8,230 deadweight cargo liners

A series of 500 deadweight coastal (replenishment) tankers

Small craft such as 500-300 ton dumb general cargo barges, salvage and fire-fighting tugs of 2,000 hp and small naval vessels

Port Said Shipyard. A subsidiary of the Suez Canal Authority, the yard is situated at the Suez Canal entrance. Facilities are as follows:

2 floating docks of 25,000 and 5,000-ton capacity

6 slipways for repair

2 building berths for ships of 12,000 deadweight

2 fitting-out quays 90 metres and 750 metres in length

2 floating cranes of 90-ton and 200-ton capacity

The yard builds dredgers and small cargo ships up to 6,500 deadweight. Repair work covers steam and diesel engine repairs and electrical repair work.

Canal Naval Construction Co., Port Said. A small company able to build small craft, tugs, barges, launches and other harbour craft. The company is also able to carry out repairs to diesel and steam engines. Facilities are as follows:

1 slipway, up to 300 tons

1 floating dock up to 750 tons

Maintenance workshop

Port Said Engineering Works. This company has two branches, one at Port Said and the other at Port Tawfik in Suez. Main activities are:

Refrigeration work and "Metalock" repairs

General repair work, hull machinery and electrical repairs

Agencies for leading radar manufacturers

Timsah Shipbuilding Company. A subsidiary of the Suez Canal Authority, the company's head office and main yard are located at Ismailia. A branch has been founded at Alexandria which is the Abou-Qir Shipyard.

Timsah yard is considered to be one of the most specialized yards in the design and building of all types of tugboats equipped with fixed pitch, controllable pitch or Voith-Schneider propellers.

The company also specializes in the design and construction of floating cranes, dredgers, self-propelled barges and hopper barges, service and passenger launches. The availability of floating crane barges, supply vessels, tugboats, launches and dredgers means that the company is in a good position to specialize in off-shore work such as laying petroleum sea pipelines and constructing floating sea-berths, mooring buoys and floating jetties.

Egyptian Shipbuilding and Repair Company. Located at Alexandria, the yard has the following facilities:

1 floating dock of 600-ton capacity

3 slipways of 250, 500 and 600 tons

Over 380 metres of repair quays

The yard can build and repair tugs, barges, dredgers, trawlers, passenger ferries and coastal tankers up to 3,000 deadweight and carry out repairs afloat on ships up to 80,000 deadweight.

Other activities include repairs to MAN, MWM and Mitsubishi engines up to 30,000 horsepower, repairs to electrical, navigational, refrigeration and air-conditioning equipment, work in the industrial sectors on desalination plants, oil and chemical tanks and pipelines.

Suez Marine Arsenal. The company is located at Suez and is specialized in general ship repairs and hull, electrical and machinery repairs. Repair activities are based on a dry-dock of 141 metres x 21 metres and a slipway with 250-ton lifting capacity.

Suez Canal Authority's yards. Strategically situated on the east bank of the Canal, the Suez yard undertakes ship-repair, new construction and general engineering and currently employs about 2,600 people. Hitherto, work has been mainly for the Canal Authority. A study is now being undertaken to assess development prospects for the yard with a view to continuing to build vessels for Egypt while using its strategic position to attract international repair work. The project will be financed by the World Bank and completion is anticipated in four years.

Ship care Egypt. A newly-formed marine engineering and servicing company at Port Said. The new enterprise is a consortium of two British companies, namely John Swire and the Petrocon Group, and their Egyptian partners, National Shipping Enterprises and Services Co. (NASHIPCON). The company has already started its activities which include technical engineering support and procurement and installation of marine equipment and replacement parts.

In addition to the aforementioned companies, there are a number of small companies capable of building small craft for work on the River Nile and coastal trades.

Greece

On 31 December 1978, the Greek merchant fleet numbered 4,200 vessels of approximately 37 million gross tons. This represented 8.5% of the world tonnage. A well-established shipbuilding and shiprepair industry also exists in Greece and as a result:

(a) Greek shipowners have the opportunity to build, convert and repair ships in their own country;

(b) Employment is provided for a large number of workers who would otherwise be unemployed;

(c) Foreign exchange is imported into the country and the loss of it, for newbuildings, conversions and repairs in foreign yards, is reduced;

(d) The establishment and development of related supporting industries is encouraged;

(e) The country is being industrially and economically developed.

The shipbuilding industry's dependence on the Greek merchant marine means that there exists a close and steady tie between the merchant marine and the national economy.

The major part of the Greek industry consists of 4 shipyards namely: the Hellenic, Elefsis, Neorion Syrou and Khalkis shipyards. The potential of these yards, along with the future planned ones, is shown in table 1. Ideally, these yards are all involved in production, conversion and repair work. As a result of the international shipping crisis, however, they have not been working to full potential and have cancelled their development programmes. Hellenic Shipyards have reduced newbuilding production to approximately 50% of maximum potential, maintaining it at this level through construction of patrol boats and other fast warships for the Greek navy. The Elefsis Shipyards have suspended all newbuilding work, the Neorion Syrou Shipyards are building auxiliary vessels and the Khalkis Shipyards are involved in conversions. It will be seen from table 1 that existing potential for the shipyards is 270,000 gross tons while actual production is currently 164,000 gross tons per year.

In general, all of the major yards have been using their potential in the shiprepair sector, which is being continuously developed by the establishment of new facilities. (See table 2.)

Table 1. Existing and anticipated capacity of Greek shipyards
(In GRT)

Shipyard	Present production	Capacity	
		Existing	Planned
In operation			
Hellenic	97,000	150,000	200,000
Elefsis	29,500	70,000	100,000
Neorion Syrou	-	-	10,000
Other small shipyards	38,500	50,000	70,000
Subtotal	165,000	270,000	380,000
Planned			
Pylos	-	-	150,000
Thenamaris	-	-	60,000
Lavrion	-	-	50,000
Itea	-	-	70,000
Malamata	-	-	50,000
Subtotal			380,000
Total	165,000	270,000	760,000

Table 2. Operating and planned drydocking facilities
(In deadweight tons of drydocked vessel)

Shipyard	In operation				Planned			
	Floating docks		Graving docks		Floating docks		Graving docks	
	No.	Capacity	No.	Capacity	No.	Capacity	No.	Capacity
Hellenic	1	72,000	1	250,000				
	1	37,000	1	500,000				
	1	66,000						
Elefsis	1	25,000					1	150,000
	1	65,000						
	1	120,000						
Neorion Syrou	1	20,000					1	75,000
	1	75,000						
Piraeus Port Authority	1	8,000	1	2,500	1	10,000		
	1	35,000	1	15,000	1	60,000		
Khalkis	1	40,000					1	80,000
Pylos					1	70,000	1	500,000
					1	35,000		
Thenamaris					1	30,000	1	60,000
Lavrion					1	45,000		
					1	30,000		
Itea					1	40,000		
Kriti					2	35,000		
Kalamata					2	30,000		

Note: There are numerous slipways in the small yards of the Perama-Salamina area where ships of up to 5,000 deadweight tons are repaired.

In addition to the major yards there are a number of smaller yards. The shipyards of the Perama-Salamina area are primarily involved in newbuildings and conversions. In the Athens area the shipyards and dockyards are mainly involved in ship repairs and conversions. Also in the Athens area there are numerous boatyards which build fibreglass boats of all kinds.

Ships of up to 5,000 deadweight are being built in the smaller shipyards. There are plans to increase their capacity for newbuildings of 10,000 to 15,000 deadweight tons.

Construction of ships of the above sizes in these yards is considered ideal because:

(a) There is large international demand for ships of this size and this demand will continue;

(b) The cost of construction of these ships in Europe is high;

(c) The technological problems are simple;

(d) There is a close relationship between the employment of men and materials.

It is emphasized that the larger yards are also seeking orders for similar sized newbuildings. While acknowledging that the construction of small ships in yards designed to build larger ships is not ideal, there is apparently no alternative when other orders are unavailable.

The potential of the Greek yards in the shiprepair sector including the major yards is 26 million deadweight. With the addition of the planned drydocking facilities, the potential of the repair yards will be approximately 32 million deadweight.

Great progress is being made in ship design. There are a number of naval architecture and marine engineering design firms in Piraeus and many of these use computers. These firms are involved in the design and construction of ships internationally.

All of the marine classification societies have representatives in Greece which also serves as the base for the Mediterranean region for many of them.

Greek ships are inspected for safety of navigation by the Merchant Ships Inspection Service of the Ministry of Merchant Marine, which ensures that ships meet the requirements of the international and national safety regulations (SOLAS, IMCO etc.) through checking designs of newbuildings, inspections during construction and periodic surveys.

Considerable attention is also given to naval architecture research through the department of Naval Architecture and Marine Engineering of the Technical University of Athens. A model testing tank has recently been completed. Its dimensions are length 90 metres, width 50 metres and depth 3 metres. Models of ships up to 60,000 deadweight can be tested.

The current crisis is the worst that Greek shipping has ever faced and the situation is unlikely to improve in the foreseeable future. Ways of coping with depressed market conditions have been researched worldwide and one result has been the emergence of new specialised ship types (Ro-Ro, Containers, Lash etc.) which, due to advanced technical characteristics, are comparatively more competitive. Greek shipping was not adjusted to the new reality. As a result, approximately 7% of the Greek merchant fleet is laid-up and a large number of ships operate without profit or at a loss.

A shortage of floating and graving docks in Greece means that ships go to foreign yards for repairs with a resulting loss of foreign exchange. Lately, an attempt is being made to establish repair yards, with drydocking facilities, at shipping centres or passing through points for ships.

One further factor, which prolongs the crisis, concerns the situation in the freight markets. Freight rates will only be substantially improved by a reduction in the number of ships being offered and a boost in the world economy. Unfortunately many countries continue their ship construction programmes as a means of reducing employment while various shipowners continue to operate ships at a loss. These policies prolong the persisting imbalance between demand and supply.

Malta

Closure of the British naval yard on Malta meant that alternative employment had to be found for several thousand highly-skilled men, who had been trained in the naval yard, if their skills were to be retained on Malta. In addition to being a major provider of employment, the naval dockyard had also represented one of the few pillars upon which the economic structure of Malta rested at that time. Closure of the naval yard implied an unparalleled economic, political and social disaster unless the facilities and skills available could be immediately adapted to commercial use. This required heavy financial investment in the form of new machinery, rehabilitation of staff, and extensive civil engineering work (dock construction and extensions). That Malta should become a centre in the Mediterranean for shiprepairing and shipbuilding is now a major national economic objective. The two enterprises responsible for its realization are Malta Drydocks and the Malta Shipbuilding Company Limited.

The main function of Malta Drydocks is shiprepairing. Additionally, it undertakes some shipbuilding and a range of industrial and electrical engineering works.

Malta Drydocks operates 5 dry docks. The largest dock can accommodate ships up to 110,000 deadweight. A sixth dry dock, capable of accommodating ships up to 300,000 deadweight, will be commissioned in 1979 and Malta Drydocks will then be in a position to dock the largest ships which are likely to transit the Mediterranean.

Malta Drydocks offers its customers a full range of hull, engine, electronic and electrical repairs. Facilities include a modern tank-cleaning installation which is a major contribution to the avoidance of marine pollution in the Mediterranean.

Work carried out includes voyage and accident repairs, surveys, conversions and jumboizing. Special services available include drawing office and laboratory facilities, blasting and coating and underwater cleaning.

Regular training programmes are maintained to ensure that the latest technological developments are available to, and within the competence of, the work-force. These programmes range from refresher courses held in the shipyard to on-the-job advanced training overseas.

Malta Drydocks also operates a yacht and small craft repair yard equipped with seven slipways capable of handling boats up to 60 metres in length and 500 tons displacement.

In 1971, Malta Drydocks introduced worker participation in the administration of its affairs. Workers have since attained full participation in the management of the yard.

The Malta Shipbuilding Company Limited was set up in 1976 when it took over full control of the Marsa Shipyard Project. The Marsa Shipyard is being constructed to modern specifications, will be highly automated and will have a capacity to build ships up to 120,000 deadweight. It is estimated that construction of the yard will be completed by the end of 1980. The necessary designs and working drawings have been completed. Soil investigations have been made and rock cutting and silt dredging are at an advanced stage. The workshop foundations have also been completed and the massive steel workshop structure is in hand. Construction of the quay walls is at a very advanced stage. Schemes are currently being developed for selection and training of the required yard personnel.

It is acknowledged that there will be teething problems and Malta will rely on sub-regional co-operation in the face of competition from the rest of the world. The shipyard project is modest and will not affect the world situation. It will, however, mean a lot to Malta as it will retain labour and create avenues for the development of ancilliary industries.

Syrian Arab Republic

The Syrian Arab Republic provides a land bridge between Europe, the United States, the Middle East and Gulf countries, through the major ports of Latakia and Tartous. Tankers of 70,000-100,000 deadweight call at oil terminals for exported Syrian crude oil. It is expected that Iraqi crude will soon be exported through the Syrian Arab Republic.

Despite substantial port traffic there are no ship-building facilities. There is 1 x 1,000 ton capacity mechanical slipway at the Port of Latakia for maintenance and repair. In terms of facilities, local experience and industry, the Syrian Arab Republic cannot meet the requirements of the ships calling at its ports.

Development of the maritime industries was commenced in 1970 by making better use of old local facilities, by thorough discussion into methods of extending and expanding local facilities and, finally, by giving priority to the establishment of a national fleet. The public and private sectors were both encouraged in accordance with the vital need of the country for such enterprises.

In the private sector, the fleet now comprises 40 coasters ranging in size from 500 to 2,500 deadweight which fly the Syrian flag. In the public sector, 3 second-hand ships in the 3,000 to 5,000 deadweight range are owned by the Syrian Arab Navigation Company. Recently, a new joint venture, known as the Syrian-Jordanian Shipping Company ordered 2 new ships of 6,300 deadweight which are being built in Poland. This is considered to be the 3rd stage in the development of a national fleet.

The fleet will serve maritime transportation requirements of the Syrian Arab Republic. The coasters will trade within the Mediterranean and Black Seas, the larger ships will trade to Northern Europe.

The need for shiprepair and drydocks suited to the present conditions is now manifest, particularly for the coasters. The one locally available slipway (1,000-ton capacity), is busy throughout the year and suitable facilities are needed to assist with repair and maintenance. The larger ships can meet their requirements for regular docking and maintenance in foreign ports until a large-scale plan to cover their needs is evolved.

The following elements will have a large influence on any future actions:

Planning

Data collection and field studies are required to ensure that any plan covers all needs of the country. A study, completed in 1966, concentrated on the following:

(a) A drydock of 80,000 tons capacity, with dimensions of 250 metres x 42 metres x 12 metres;

(b) Two mechanical slipways, each of 1,000-ton capacity;

(c) A floating dock of 3,000-ton capacity;

(d) Workshops incorporated with (a), (b) and (c);

(e) Technical and specialized manning levels.

This study could be revised to take account of the new situation in the area.

Finance

Plans for such large projects will remain on the shelf unless offers of finance and backing are available. Finance is always a problem for developing countries. The substantial needs of agriculture and other branches of industry and trade also have to be taken into consideration. A practical solution must be found, however, if the project is to become established.

Manning

Locally available skilled personnel are in short supply and lack experience. Improving the experience of local personnel and providing additional skilled personnel will add further to expenditure and costs and again the need for support and assistance is apparent.

Examination of the distribution of drydocks, shipyards and floating docks around the Mediterranean coast shows that it is necessary to complete the ring of shiprepairing enterprises by building facilities in the Syrian Arab Republic, thereby allowing damaged ships to be repaired wherever required.

International organizations, such as UNIDO, can offer great assistance and are invited to offer support in data collection, in carrying out studies, in compiling statistics and in suggesting methods of solving the aforementioned problems.

Turkey

Turkey entered a planned economy period after the 1960s in which a balanced and rapid growth were envisaged in all economic and social sectors. The transport sector was given high priority in the development plans since healthy and well co-ordinated development efforts could only go hand in hand with a well prepared and implemented transport plan.

Although the development plans - which are prepared by the State Planning Organisation, submitted to Government and later enacted by Parliament - could bring forward imperative measures and investment targets to be implemented by the private sector, they could only describe promotive incentives for the private sector. Within the framework of 5-year development plans, most of the targets have been realized in the maritime field both in the public and private sectors.

Turkish shipping and shipbuilding industries can still be considered to be in their infant stage. The amount of exported goods carried by Turkish flag ships barely exceeds 20% of the total. The situation is only slightly better in the import of goods to Turkey where 25% to 30% of the total is carried in Turkish ships. Since almost 90% of Turkey's imports and exports are carried by sea it is evident that there is still much to be done in the maritime sector in Turkey in order to maximise benefits. In shipbuilding, the situation is similar. Turkey still imports more than two thirds of its fleet from abroad.

Turkey now aims to carry 40% of her export and import commodities in Turkish flag ships through modernizing and expanding the existing fleet. To achieve this goal it is envisaged that present shipbuilding and shiprepair facilities will be modernized and new capacity established.

Existing shipbuilding and shiprepair facilities can be broadly classified as follows:

(a) Those owned by the Maritime Bank (table 3). The Maritime Bank is a State economic enterprise under the Ministry of Transport, established in 1951 (although it was first established in 1843 under the name of Ottoman Interests) and authorized to operate passenger lines, cargo lines (later organized as a separate shipping line under the name of D.B. Cargo Lines), ferry services, shipbuilding and repair facilities and to act as a banking, marine insurance and financing company, and to carry out other relevant functions.

(b) Those owned and operated by the Turkish Navy. There are 2 shipyards owned by the Navy, namely Golcuk (at Izmit) and Taskizak (at Istanbul) shipyards. Although mainly constructing for the Navy, their spare capacity is allocated to merchant ship construction. Golcuk shipyard, which is the largest and most modern shipyard in Turkey (with the exception of the Pendik yard which is under construction) can build ships up to 20,000 deadweight. The Taskizak shipyard can build ships up to 7,500 deadweight.

(c) Those owned and operated by the members of the Shipbuilding Association of Turkey (privately-owned shipyards) (table 4). There are about 22 shipyards in this category, situated mainly in the Marmara Sea region, of different sizes and capacity. The larger yards, which were established in the last decade, can build most types of ships (dry cargo, bulk carrier, tanker, LPG, Ro-Ro etc.) up to 25,000 deadweight. Total annual shipbuilding capacity of all privately owned shipyards is about 195,000 deadweight.

The fourth five-year development plan envisages that an increase of about 1 million deadweight of different types and sizes of ships will be added to the present merchant fleet. This will provide a total capacity of 2.8 million deadweight by the end of 1983, and will enable Turkish flag ships to carry 40% of Turkish export-import commodities.

It is intended that the majority of the new ships required will be built in local yards. The additional shipbuilding capacity will be provided by the Pendik shipyard (scheduled to become operational in 1980) and by shipyards to be erected on the Tuzla shipbuilding site. Tuzla Bay (near Pendik) was prepared by the Government and organized so that, 19 available pieces of land, varying in size from 20,000-80,000 m^2, would be allocated to selected investors on a long-term lease contract basis. Most of the shipyards at the Tuzla site are expected to be completed by the end of 1982.

The Turkish Government also decided to establish a joint venture marine diesel-engine factory to be sited behind the Pendik shipyard site. The factory will manufacture slow-speed engines, ranging from 4,350 to 14,400 bhp.5/ In the meantime medium-and high-speed engines up to 5,000 to 6,000 bhp will be manufactured in the Eskisehir locomotive and engine factory of Turkish railways. Engines up to 2,400 bhp are currently manufactured in this factory. It is planned that the Pendik factory will manufacture engines up to 26,800 bhp in future.

The local content in the Turkish shipbuilding industry is now about 50%. Provision of the new marine diesel engine factory, new electronic and electric equipment and component manufacturing facilities will result in a much higher local content during the next 5 year development plan period.

5/ Brake horsepower.

Educational and training facilities are offered by the Institute of Shipbuilding, Technical University of Istanbul and the newly established faculty of shipbuilding in the University of Ege, Izmir. A model test laboratory is available at the Technical University of Istanbul.

The Libyan Arab Jamahiriya and Turkey now aim to establish a joint-venture shipyard in the Libyan Arab Jamahiriya in the next 4-5 years.

Turkey has no contract design bureau and this is seen as a major disadvantage since new designs take several months to develop. The alternative is to import designs from developed countries which requires hard currency.

Table 3. Shipyards owned and operated by the Maritime Bank

Name	Location	Total area (m^2)	Number of slipways	Sizes of slipways (m)	Annual shipbuilding capacity (dwt)	Largest ship to be built (dwt)	Personnel			
							Workers	Engineers	Technicians	Administrative
Camialti	Istanbul	72,000	2	91.7 x 16.5 140 x 24	34,000	20,000	1,358	43	26	41
Halic	Istanbul	69,101	2	56 x 18 70 x 23	5,600	4,000	1,740	40	51	63
Istinye (1)	Istanbul	25,772	1 2 floating docks	90 x 20	3,400	4,000	1,020	15	13	41
Haskoy	Istanbul	11,335	2	53 x 11.3 52 x 11	2,700	1,700	351	8	5	32
Alaybey (1)	Izmir	44,340	2	49 x 3.1 32 x 2.8	2,000	2,500	403	20	14	48
Pendik	Istanbul	580,000	Drydock	-	150,000	280,000	2,000			

Note: 1. The dominant function of the Halic and Alaybey shipyards is shiprepair. Alaybey shipyard is in the midst of an enlargement and modernization process and will be equipped with a syncrolift system to enable it to repair 12 ships up to 12,500 dwt simultaneously.

2. Pendik Shipyard is under construction and is expected to begin operation in late 1981.

Table 4. Shipyards owned and operated by the members of Shipbuilding Association of Turkey
(Privately-owned shipyards)

Name	Location	Total area (m^2)	Number of slipways	Sizes of slipways (m)	Annual shipbuilding capacity (dwt)	Largest ship to be built (dwt)	Personnel		
							Workers	Engineers and/or Technicians	
Anadolu	Istanbul	4,200	2	75 x 14	5,000	4,000	130	3	3
Atilim	Istanbul	4,000	1	110 x 7	8,000	8,000	45	1	
Celik Tekne	Istanbul	2,400	2	70 x 6 65 x 5	6,900	5,000	120	7	1
Degas	Izmir	4,200	2	75 x 21	10,000	10,000	57	2	8
Desan	Istanbul	2,400	2	60 x 13 40 x 12	1,500	1,500	60	1	1
Celiktrans	Istanbul	2,100	2	80 x 14 60 x 12	2,500	1,800	25	2	
Dokerel	Istanbul	4,200	2	75 x 15	3,000	3,500	51	1	
Cemak	Istanbul	2,400	1	45 x 12	3,000	1,200	42	2	2
Gemi-Is	Istanbul	1,650	2	70 x 8 50 x 8	3,750	3,500	30	1	
Gemi Insaat Koll. Sti.	Istanbul	18,000	2	80 x 12	3,750	2,500	55	1	

Gunsin	Istanbul	2,800	3	50 x 12	6,400	3,000	54		1	
Hidridinamik	Istanbul	4,000	2	60 x 14	6,000	3,500	50		2	
Gelibolu	Canakkale	40,000	2	90 x 20 120 x 26	4,500	4,500	80		2	
Kiyi	Canakkale	80,000	1	200 x 30	25,000	10,000	300	25		35
Marmara	Izmit	23,000	4	110 x 22 80 x 24 8 x 18 14 x 22	32,400	17,000	190	6		4
Meltem	Istanbul	9.000	2	115 x 18 70 x 10	10,000	5,000	130	6		3
Profilo	Istanbul	15,000	2	75 x 13 60 x 13	2,000	3,000	70	2		2
Sedef	Izmit	72,000	4	135 x 18 170 x 22 46 x 12 250 x 40	36,400	26,000	350	18		3

Note: Other small privately-owned shipyards having less than 2,000 m^2 total area are not included in the table.

VI. SUMMARIES OF PAPERS PRESENTED BY OBSERVERS

Bulgaria

The shipbuilding and shiprepair industry in Bulgaria includes 12 shipbuilding and shiprepair yards and manufacturers of ships' equipment. The maritime industries are supported by 6 research, design and training organizations.

The shipyards and 6 ship equipment works are part of the State economic enterprise Bulgarian Shipbuilding Industry with head office in Varna. The shiprepair yard in Varna is part of the State economic enterprise Water Transport. The shiprepair yard in Bourgas is part of the State economic enterprise Fishing Industry.

The shiprepair yard in Varna has a drydock with capacity up to 50,000 deadweight and 2 floating docks with lifting capacity 25,000 deadweight. It specializes mainly in the repair of cargo and passenger ships. The shiprepair yard at Bourgas, equipped with a lifting device of 8,000 deadweight capacity and a floating dock of 4,500 deadweight, specializes in the repair of fishing vessels. Shiprepair facilities in Bulgaria are insufficient and the services of some Mediterranean countries are used.

Ships built in a long series during the period 1968-1978 include: tankers (100,000 and 5,000 dwt), coal/ore carriers (38,000 dwt), bulk carriers (25,000 dwt), coal carriers (10,000 dwt), dry cargo ships (6,000, 2,500 and 1,500 dwt), oil bunker ships (3,000 and 1,500 dwt), river push barges, floating hotels and floating workshops.

About 60%-70% of the ships produced in the period 1960-1978 were exported, mainly to developed countries of Norway, Poland, the Union of Soviet Socialist Republics, the United Kingdom and the United States.

Bulgaria has its own research centres and design institutes capable of undertaking model tests, education of technical and scientific staff, research and design of ships, ships' equipment and shipyards, computer-aided design and automation. The availability of a well-developed scientific and design capability, which exceeds the needs of Bulgaria, permits realization of international co-operation, scientific-technical exchange and provision of scientific and design services for other countries.

Future plans are to:

(a) Complete re-construction of the shipyards ir Russe and Bourgas and construct dockyards in Varna and Bourgas;

(b) Complete modernization of the ship machinery plants at Shuman, Novi Pazas and Turgovishte during 1980/81;

(c) Increase automation of the production processes;

(d) Increase the variety of types of ships produced;

(e) Complete computer-aided design and automation of the management functions;

(f) Increase research and design capability in order to improve the technical performance of ships, ships' equipment and the organization of labour;

(g) Improve training of staff at all levels;

(h) Develop bilateral and multilateral co-operation.

Bulgarian shipbuilding and shiprepair facilities have developed quickly over the past 20 years and the country now possesses the necessary components of a modern industry. This branch of the national economy is highly efficient, contributes greatly to the favourable balance of payments and plays a significant role in the dynamic economic development of Bulgaria. The available base and future plans for development provide for the needs of Bulgaria's merchant fleet and for the future development of foreign trade and international economic and scientific technical co-operation.

Poland[6/]

When considering creation of a modern shipbuilding and shiprepair industry there are two questions which have to be answered. First, if it is not too late to start the work and second, in which direction the development should proceed. In answer to the first question one can say that it is not too late and that there is still time to start a shipbuilding industry, even from zero. Poland started from zero after the Second World War, with a totally destroyed industry. Like many of the developing countries of the Mediterranean sub-region it had no traditions and no people educated in shipbuilding. Today, the shipbuilding industry alone employs 70,500 people and the yards are booked to capacity until the end of 1982. The industry is, therefore, a success and is now in a position to design, investigate and build all types of ships including gas tankers and passenger ferries.

Poland has 2 research institutes which are mainly concerned with ship design and shipbuilding technology for the future.

The Polish industry is fully prepared to co-operate with the developing countries in the fields of research, design, shipbuilding and training for the shipbuilding and shiprepair industry.

Polish shipbuilders and repairers have recently had very good experience in co-operation with the Mediterranean countries in design, in training of staff and in selling the ships which have been produced in these countries.

The second question concerns the direction in which the shipbuilding or shiprepair industry should proceed. Following the Polish experience, it is suggested that the shiprepair industry in all Mediterranean countries be developed and that each country specialize in building a few types of ships that will cover the requirements of the developing countries and also of other countries. Co-ordination is very important in this context and it is hoped that the Mediterranean Maritime Centre will facilitate this task. The Polish case indicates that such development and specialization is possible.

6/ This paper was not read at the Workshop but copies were distributed to delegates.

Portugal

At an international level, building and repairing of wooden vessels are of little importance with regard to employment or value of production. However, the yards concerned are sometimes the only industry in the place concerned, utilizing wood from Portuguese forests and producing small boats for inshore and deep-sea fishing. They are, therefore, of interest at a regional level.

In the context of steel ships, there are basically 9 units which are primarily engaged in shipbuilding and repairing. The nine units vary considerably in size. In the table below, they are grouped according to number of employees.

Number of employees	Number of enterprises
100-250	1
300-700	3
900-2,000	2
3,000 -4,000	1
6,000 -10,000	2

Two of the nine units belong to the State sector, the State participates in 2 others and 1 is a navy shipyard which also belongs to the State. The remaining 4 belong to private companies. The two largest enterprises in Portugal are Lisnave and Setenave. Lisnave is one of the largest repair facilities in the world. Although it has a building department this is about to be closed by retirement of some of its 1,700 workers and by transfer of the remainder to repair work. Thereafter Lisnave will be devoted exclusively to shiprepair.

Setenave is the biggest and most sophisticated Portuguese yard. It is engaged on newbuilding work (approximately 60%) and repairs (approximately 40%). Setenave was launched at the beginning of the current crisis and development has not been accomplished in accordance with the initial plans. Some adjustment schemes have been implemented in order to increase capacity and to resist the present adverse international environment. Setenave has not created more than 6,000 jobs. At the early stages of development, creation of 10,000 new jobs had been foreseen.

Portugal has 15 dry docks of different sizes and mostly engaged in shiprepairing, 1 floating dock, one large building platform (450 x 75 m) and several slipways in small shipyards. Potential steel throughput for Portuguese shipyards is approximately 150,000 tons per year.

Portugal has already accumulated experience in the building of fishing vessels, tugboats, small warships, cargo and container ships, ferries, chemical carriers, dredgers, Ro-Ro ships, punts and hulls.

The prevailing international crisis in shipbuilding and shiprepairing has affected different Portuguese shipyards in different ways, according to size. The difficulties of the smaller, predominantly home-oriented shipyards, which are somewhat underequipped, are mainly a consequence of the sharp wage increases of 1974/75. The larger shipyards have been more affected by the international crisis because the competition has become much more acute (subsidization of exports, either directly or indirectly, which does not exist in Portugal, has become widespread).

Nevertheless, the medium-term prospects for the development of the Portuguese shipbuilding and shiprepairing industries are favourable, in spite of the present difficulties, and are based on both the home market and on exports. The competitive capacity in foreign markets should be increased by development of subsidiary industries to reduce independence on imports, by improvement of design capacity and by implementation of effective marketing activities.

Annex I

LIST OF PARTICIPANTS AND OBSERVERS

Participants

ALGERIA	HAMIDI, B. Sous-Directeur Technique Ministere de la Defense Nationale Alger
	BOUKHIL, N. Sous-Directeur charge de la Réparation Navale Ministere de la Défense Nationale Alger
	BAZIZ, N. Directeur Chantier Naval Ecole de El Kebir Ministere de la Défence Nationale Alger
CYPRUS	HECTORIDES, P. E. Director Department of Electrical and Mechanical Services Ministry of Communications and Works Nicosia
	KYRIAKIDES, C. A. District Engineer Electrical and Mechanical Service Limassol Ministry of Communications and Works Nicosia

EGYPT

ABEL MAABOUD, H. M.
Berth Shop Superintendent
Alexandria Shipyard
Gate 36 - Kabary - Alexandria

EL CHARNOUBY, F. F.
Chief Engineer of Hull Shops
Alexandria Shipyard
Gate 36 - Kabary - Alexandria

HASHEM, Y. M.
Head of Technical Office
Alexandria Shipyard
Gate 36 - Kabary - Alexandria

GREECE

EFTHIMIOU, D.
Lieutenant Commander Hellenic Coast Guard
Division of Marine Development
Ministry of Mercantile Marine
Piraeus

LOUVIS, M.
Naval Architect - Marine Engineer
Head, Newbuildings and Conversions
Surveys Office
Merchant Ships Inspection Service
Ministry of Mercantile Marine
Piraeus

MALTA

CALLEJA, J. M.
General Manager
Malta Drydocks

COPPINI, H.
Chairman
Malta Shipbuilding Co Ltd

SCERI, F.
Chairman
Malta Drydocks

SYRIAN ARAB REPUBLIC

GHADBER, I.
Engineer
General Directorate of Ports
Lattakia

KHALED, A.
Engineer
General Directorate of Ports
Lattakia

TURKEY

BARUTCU, M.
Expert
State Planning Organization
Ankara

DALAMAN, M.
Expert - Engineer
Ministry of Transportation
Ankara

GILLI, T.
Chief Engineer
Istinye Shipyard
Istanbul

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANIZATION (IMCO)	MITSCHKA, C. Technical Officer Sub-Division for Technology Maritime Safety Division
UNIDO Secretariat	CYRANSKI, J. Head, Engineering Industries Section Industrial Operations Division
	PANYUSHKIN, D. Industrial Development Officer Engineering Industries Section Industrial Operations Division
	PEACH, J. L. Consultant Engineering Industries Section Industrial Operations Division
	LALKAKA, R. D. Senior Industrial Development Field Advicer
	KASTBERG, H. Administrative Assistant Engineering Industries Section Industrial Operations Division

Observers

BULGARIA	HADJIMIKHALEV, P. H. Deputy Director Bulgarian Ship Hydrodynamics Centre Varna
	KARAZLATEV, I. J. Deputy Director Research and Design Institute Bulgarian Shipbuilding Industry Varna
	YOSIFOV, K. Chief of Department Bulgarian Ship Hydrodynamics Centre Varna
DENMARK	FRYLAND, N. Naval Architect Danish Ship Research Laboratory Hjortekaerevej 99 DK-2800, Lyngby
FEDERAL REPUBLIC OF GERMANY	EUSSNER, A. Economist German Development Institute Fraunhoferstrasse 33 - 36 1000 Berlin (West) 10

FEDERAL REPUBLIC OF GERMANY	MELCHERT, H. General Manager H. Melchert Maritime Development Claussenstrasse 2 2850 Bremerhafen
FINLAND	HEINO, E. A. Representative for Rauma - Repola Oy 26100 Rauma 10
FRANCE	YANNIC, J. Engineer Les Ateliers et Chantiers de Bretagne 44040 Nantes Cedex
IRELAND	CROTTY, A. A. Correspondent Sunday Press Dublin
ITALY	CIONGOLI, G. Sales and Marketing Manager Ficantieri Via Sardegna 40 Roma
	LUDOVISI, E. Marketing Expert Ficantieri Via Sardegna 40 Roma
MALTA	AQUILINA, E. F. Marine Surveyor Malta Drydocks
	ATTARD, A. Naval Architect Malta Drydocks
	BALDACCHINO, N. A. Principal Surveyor for Malta Bureau Veritas Floriana
	CURMI, J. General Manager Sea Malta Co Ltd Floriana
	DEBONO, E. Senior Surveyor in Charge Lloyds Register of Shipping Lloyds Register of Shipping 5 Lascaris Wharf Valletta
	DUA, O. P. CFTC Harbour Master to the Government of Malta Port Department Valletta

MALTA

FARRUGIA, J.
Public Relations Officer
Malta Drydocks

GAUCI, V. A.
Director
Malta Shipbuilding Co Ltd

MARKUS, T. H.
Deputy Leader
Marsa Shipyard Project
Malta Shipyard Co Ltd

MONTEFORT, C.
New Building Marketing and Sales Manager
Malta Drydooks

RIGBY, J. H.
Shipbuilding Advisor
Malta Shipbuilding Co Ltd

SHETH, D. S.
Advisor New Construction
Malta Drydocks

XERRI, G.
Executive
Sea Malta Co Ltd
Floriana

ZAMMIT, C.
Manager
Sea Malta Co Ltd
Floriana

POLAND

LUBOCKI, Z.
Director
CENTROMOR
Gdansk

MAZURKIEWICZ, B.
Professor
Technical University
Gdansk

PORTUGAL

ALEXANDRE, L.
Marketing Manager
SETENAVE
P.O. Box 135 Mitrena-Setubal

ATAIDE, Josè da Piedade Machado de
Shipyard Director rspresenting
Associacao das Construcdes Navais
FUZNAVE
Figueira da Foz

DE SOUSA CATITA, A.
Managing Director
SETENAVE - Setubal Shipyard
P. O. Box 135 Mitrena-Setubal

FERREIRA FEITOR, R. M.
Director of Service
Planning Department of Ministry
of Industry
Lisboa

PORTUGAL	WEINSTEIN, J. D. Vice-President Shipbuilding Association R. Castilho 90 R/C Dto 1200 Lisboa
	"
TURKEY	DOKMEN, E. Manager Maritime Bank Haliç Shipyard
	ÖZATAY, Ü, Chief Engineer Maritime Bank Alaybey Shipyard
	SARICOGLU, I. Engineer Maritime Bank Camialti Shipyard
UNITED KINGDOM	VERCOE, H. J. Senior Consultant Terminal Operators Limited Rodwell House Middlesex Street London E1 7HJ

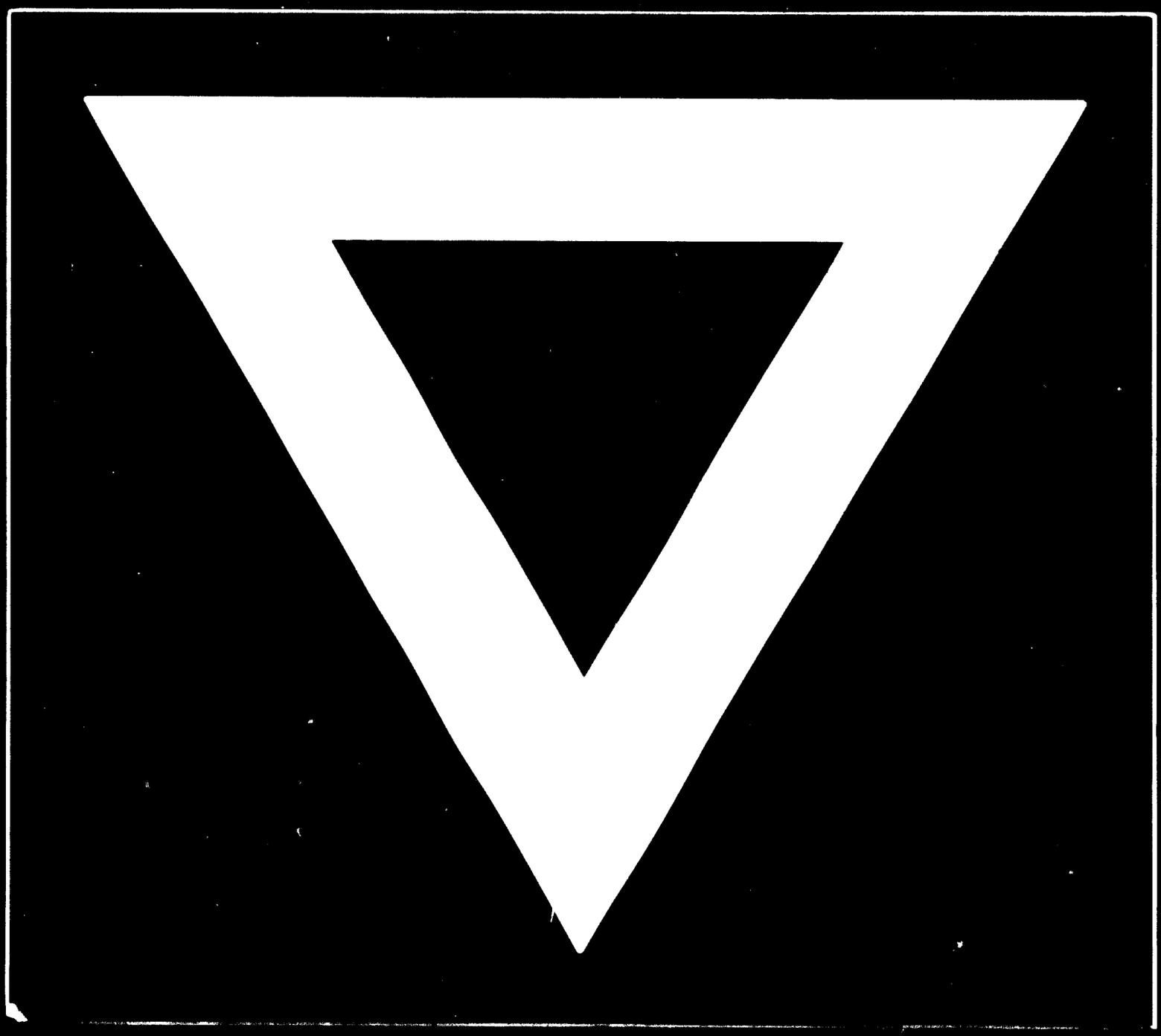
Annex II

LIST OF DOCUMENTS

Symbol	Title and Author
ID/WG.285/1	PROVISIONAL AGENDA AND WORK SCHEDULE
ID/WG.285/2	RECENT EXPERIENCE AND PROSPECTS FOR THE DEVELOPMENT OF SHIPBUILDING AND REPAIR IN DEVELOPING COUNTRIES - presented by Terminal Operators Limited
ID/WG.285/2/Add.1	ANNEX TO RECENT EXPERIENCE AND PROSPECTS FOR THE DEVELOPMENT OF SHIPBUILDING AND REPAIR IN DEVELOPING COUNTRIES - presented by Terminal Operators Limited
ID/WG.285/3	BRIEF SUMMARY OF ACTIVITIES OF THE INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANIZATION CONCERNING SHIP DESIGN AND CONSTRUCTION - presented by IMCO
ID/WG.285/4	THE SHIPBUILDING INDUSTRY IN MALTA - M. H. Caruana, Malta
ID/WG.285/5	SHIPBUILDING INDUSTRY IN GREECE - D. Efthimiou and M. Louvis, Greece
ID/WG.285/6	REPORT ON THE SHIPBUILDING INDUSTRY OF TURKEY - M. Barutou, Turkey
ID/WG.285/7	A GENERAL VIEW ON THE TURKISH SHIPBUILDING INDUSTRY - T. Cilli, Turkey

Symbol	Title and Author
ID/WG.285/8	THE SHIPBUILDING AND SHIPREPAIR INDUSTRY IN CYPRUS - P.E. Hectorides, C.A. Kyriakides and I. Papadopoulos, Cyprus
ID/WG.285/9	REVIEW OF SHIPBUILDING AND REPAIR SYRIAN ARAB REPUBLIC - I.A. Chadir, W. Kandji and K. Issa Syrian Arab Republic
ID/WG.285/10	SERVICE PERFORMANCE QUALITY OF SHIPS AND OCEAN PLATFORMS - presented by Danish Ship Research Laboratory
ID/WG.285/11/Rev.1	LIST OF PARTICIPANTS AND OBSERVERS
ID/WG.285/12/Rev.1	LIST OF DOCUMENTS
ID/WG.285/13	THE SHIPBUILDING INDUSTRY IN ALGERIA - presented by the Algerian Delegation
ID/WG.285/14	SITUATION AND PROSPECTS FOR THE INDUSTRY OF SHIPUBILDING AND SHIPREPAIRING IN PORTUGAL AND CO-OPERATION LINES ENVISAGED - presented by the Delegation of Portugal
ID/WG.285/15	MODERN EXPERIMENTAL FACILITIES AND NATIONAL INTEGRATED SYSTEM FOR RESEARCH, TRAINING AND DESIGN OF SHIPBUILDING AND MARINE INDUSTRY - P. H. Hadjimikhalev, Bulgaria
ID/WG.285/16	SHIPBUILDING, DESIGN AND SHIPREPAIRING - Y. M. Hashem, Egypt
ID/WG.285/17	PRESENT STATUS AND TRENDS FOR FUTURE DEVELOPMENT OF BULGARIAN SHIPBUILDING AND SHIPREPAIRING INDUSTRY - I. J. Karazlatev, Bulgaria
ID/WG.285/18	FINAL REPORT

C-149



80.04.16