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09015

United Nations Industrial Development Organization

Distr.
LIMITED

ID/WG.285/13
14 May 1979

ENGLISH
Original: FRENCH

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

Valletta, Malta, 23-27 April 1979

THE SHIPBUILDING INDUSTRY IN ALGERIA 1/

by

the Algerian delegation

1/ The views and opinions expressed in this paper are those of the Algerian delegation and do not necessarily reflect the views of the secretariat of UNIDO.

This document has been translated from an unedited original.

id.79-4688

GENERAL CHARACTERISTICS OF THE SHIPYARD

1. Production characteristics

This shipyard, which is of the universal shipbuilding and ship-repair type, is designed to handle a large variety of production assignments. During the first phase, the yard will have the technical capacity to perform the following kinds of work:

- The construction of small vessels of all types having a maximum length of 54 m and a maximum building weight of 850 tonnes; production will include, among other types, trawlers, coasters, harbour service craft (tugs, lighters, motor boats, fire-fighting boats), etc.
- The construction, using industrial techniques, of cargo vessels of all types, up to the size of a tanker of approximately 150,000 tonnes dead-weight (TDW);
- The repair of small vessels of all types having a maximum length of 54 m and a maximum building weight of 850 tonnes.

During the second phase, following the installation of the portal crane with its lifting capacity of 800 tonnes, the yard will have the technical capacity to build methane tankers of up to 125,000 m^3. In addition, the yard will produce 770 tonnes of marine equipment annually.

2. Production programme

The annual production programme of the shipyard described herein is approximate only, in the sense that it establishes:

(a) The technical production capacity. This involves establishing the principal technical parameters of the different sections of the shipyard and the requirement for machinery and equipment, production, auxiliary and storage areas, manpower, energy sources, etc.

With its 1,200 km of coastline, Algeria naturally has maritime traditions. Because of its geographical location, the country played a major role at sea until the beginning of the nineteenth century. With colonization, however, the Algerian shipbuilding industry failed to keep pace with that of other countries.

When the country gained its independence, there was no domestic shipbuilding industry, apart from the construction of wooden vessels using craft techniques. A minimum infrastructure for ship repair work did, however, exist in the form of:

- One dry dock: 125 x 20 m
- One dry dock: 83 x 16.5 m

Within its development plan, Algeria has made provision for building a merchant and fishing fleet of its own and also for establishing the necessary facilities for shipbuilding and repair operations. Thus, beginning in 1968 feasibility studies were undertaken regarding both the development of the fleet and the consumption of steel products declared to be priority items. The result of these studies was to determine the potential demand in Algeria and to raise the question of the construction of a shipbuilding and ship-repair yard.

In 1970 a study contract was signed for design studies on a shipyard to be built at Mers-El-Kébir.

These studies are currently in progress, and work on the shipyard, described below, should begin in 1980.

In a related undertaking, a training shipyard, also described below, began operations at Mers-El-Kébir in 1977, its basic function being to provide vocational training in shipbuilding and ship-repair skills under actual on-the-job conditions.

The training shipyard has acquired competence as a shipbuilding training facility and represents the country's principal source of trained personnel for the start-up of shipbuilding and repair operations.

In addition, relying on the resources of Algerian industry, a programme of gradual integration has been initiated for the purpose of ending the country's dependence on foreign imports.

The shipbuilding industry is being developed without any foreign assistance.

Ship-repair operations on an industrial scale are to begin in the immediate future.

(b) The approximate structure of production. In practice, the actual production programme will vary from year to year in line with ship operators' requirements with regard both to vessel types and to their size and number.

Activity	Product type	Unit	Annual production 1st phase	Annual production 2nd phase
Building of trawlers	Cargo vessel, 7,000 TDW	Ship	2	2
	Bulk carrier, 23,000 TDW	Ship	1	1
	Bulk carrier, 55,000 TDW	Ship	0.5	1.75
Building of trawlers	Trawler, 25 m	Ship	20	20
Repair of trawlers	Trawler, 25 m	Ship	120	120
Production of marine equipment	Capstans, davits, etc.	Tonnes	-	770

3. Shipyard facilities

The yard will be completely furnished with workshops, production areas and the auxiliary, maintenance, warehousing, social and administrative services required to complete its production programme.

The yard's principal areas will be:

(a) Dry dock, 200 x 46 x 8 m;

(b) Synchrolift with a lifting capacity of 1,000 tonnes and five fitting and repair stations;

(c) Outfitting, off-loading and service wharfs;

(d) Hull treatment and prefabrication areas with inter-operational storage facilities, including:

- Plate treatment shop;
- Hull prefabrication area;
- Cleaning and painting room;
- Hull assembly area.

(f) Storage areas, warehouses, stores;

(g) Power areas (power generating stations, compressor stations, cooling towers, purification station, boiler room);

(h) Auxiliary areas: social and administrative services (administrative and social buildings, dining areas, medical service, reception areas and parking lots).

The work areas will be equipped with modern high-performance machinery and equipment, ensuring that the ships built at the yard will be of excellent quality.

4. Work-force

No.	Category	Work-force 1st phase	Work-force 2nd phase
1.	Workers directly engaged in production	2,000	2,533
2.	Auxiliary workers	1,155	1,359
3.	Total manual workers	3,155	3,892
4.	Office employees	700	888
5.	Total work-force	3,855	4,780

5. Essential elements of the basic technological process

(a) Shipbuilding

After stress relieving and straightening on rollers at the steel depot, the shipbuilding steel (plate, shapes) leaves the depot and is sent to the hull element treatment shop.

The treated elements are made up into complete structural groups corresponding to hull sections, in the interoperational areas of the hull element make-up areas.

The structural hull elements corresponding to the completed sections are delivered to the appropriate working areas of the hull section prefabrication shop, where they are assembled, welded and initially fitted out. These sections are then taken to the cleaning and priming room. The protectively primed sections are transported to the appropriate area of the dry dock or the synchrolift.

The sections are fitted together to form the hull in the dry dock or on the synchrolift. Superstructures are built in blocks in special areas. The assembly of the hull is co-ordinated with the installation of the ship's equipment, particularly the main engines and equipment and the fittings below the water-line. Once all the welding, priming and painting work has been completed on the portion of the hull below the water-line, the ship is launched. Following launching, the final equipment installation operations are performed at the outfitting wharf.

The next step is the testing of the engines and shipboard equipment alongside the shipyard quay and in sea trials. Following the correction of any deficiencies discovered during sea trials, the ship is finally equipped as specified and turned over to the owner.

During the entire hull-building process, the equipment shops are engaged in machining and prefabricating the ship's equipment, and later in its installation.

(b) Ship repairing

Repairs are carried out on the synchrolift and at the outfitting wharf. After the vessel has been drawn up high and dry, the hull, engines, equipment and systems are inspected; equipment requiring repair is partially or entirely dismantled and removed to the workshops; at the same time, the hull is repaired, new systems are installed and preservation work is carried out. Final installation of the repaired equipment takes place after the ship has been refloated. Finally, the ship is tested alongside the quay and at sea, deficiencies are eliminated and the ship is turned over to its owner.

6. Basic technical and economic data

No.	Specification	Unit	1st phase	2nd phase
1.	Consumption of direct production labour	Thousands of hours	3,520	4,458
2.	Total number of persons employed	Persons	3,855	4,780
3.	Requirement for direct production materials, gross:	Tonnes	35,561	60,658
	- Raw materials	"	30,170	52,786
	- Semi-finished products	"	204	395
	- Finished products	"	5,187	7,477
4.	Electric power:			
	- Installed capacity	MW	40	56
	- Peak power	MW	9.5	13.5
	- Annual demand	kWh	24×10^6	35×10^6
5.	Compressed air:			
	- Maximum demand	m^3/min.	230	400
	- Annual consumption	m^3/year	42×10^6	73×10^6
6.	Oxygen:			
	- Maximum demand	m^3/hour	1,140	2,600
	- Annual consumption	m^3/year	1.5×10^6	3.8×10^6
7.	Natural gas:			
	- Maximum demand	m^3/hour	4,000	1,000
	- Annual consumption	m^3/year	6×10^6	11×10^6
8.	Fresh water:			
	- Average demand	m^3/hour	320	560
	- Maximum demand	m^3/hour	600	930
	- Maximum demand/24 h	m^3/24 h	4,000	7,000
9.	Sea water:			
	- Average demand	m^3/hour	1,300	2,000
10.	Heat (system):			
	- Maximum steam demand	Tonnes/h	24	30
11.	Total site area	m^2	480,000	482,500
12.	Developed area	m^2	59,000	66,000
13.	Approximate size of buildings	m^3	928,000	1,034,000
14.	Length of outfitting wharfs	m	924	1,206
15.	Shipyard construction costs	Millions of dinars	900 million	-
16.	Shipyard construction time	Months	42	-

Annex

TECHNICAL CHARACTERISTICS

1. **Methane tanker, 125,000 m^3**

- Over-all length	280 m
- Width	41.6 m
- Height	11.0 m

Six spherical tanks weighing 100 tonnes each.

2. **Oil tanker, 150,000 TDW**

- Over-all length	278 m
- Width	44.2 m
- Height	23.6 m

3. **Portal crane**

- Lifting capacity	800 tonnes
- Maximum lifting elevation	65 m
- Span	130 m
- Delivery time	2 years
- Approximate price	$US 12 million

GENERAL CHARACTERISTICS OF THE TRAINING SHIPYARD (CNE)

The purpose of the training shipyard is to provide vocational training under actual on-the-job conditions for the future supervisors and workers of the Algerian shipbuilding industry.

The training shipyard is organized along the lines of most modern shipyards and consists of:

- A studies office	133 persons
- A methods office	
- Production sections	400 persons
- Supply section	30 persons
- Maintenance section	150 persons

The yard's industrial facilities consist of:

- A treatment shop
- A prefabrication shop
- An assembly area (on two 60-metre longitudinal slips)
- A shop for heavy metal work
- A shop for aluminium and light metal work
- A woodworking shop
- An electrical shop
- A machine shop
- A machine assembly shop
- A pipe-fitting shop

Working on the basis of a production programme which extends over several years and includes the vocational training function, the training shipyard has produced:

1977: 1 shrimp boat
1 harbour patrol boat
2 lighters

1978: 3 shrimp boats
3 harbour patrol boats
2 lighters

and intends to produce:

1979: 12 harbour patrol boats
1 lighter
1 tug

1980: 3 tugs
40-metre launch (planned).

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