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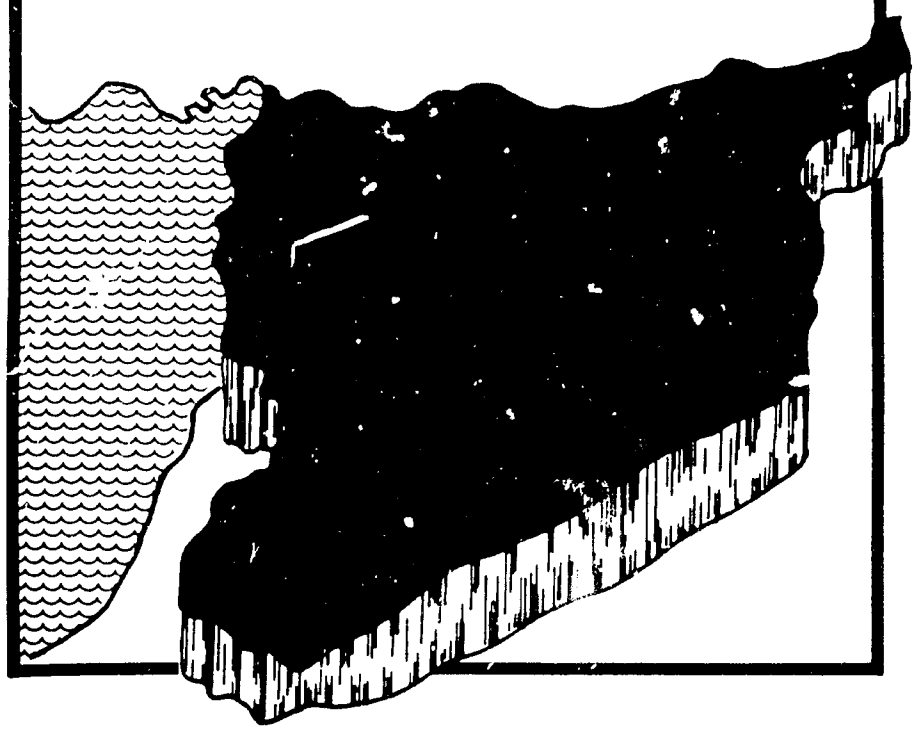

VOLUME V

PORTS AND SHIPPING

LOUIS BERGER INTERNATIONAL, INC.

in association with

TIPPETTS-ABBETT-McCARTHY-STRATTON

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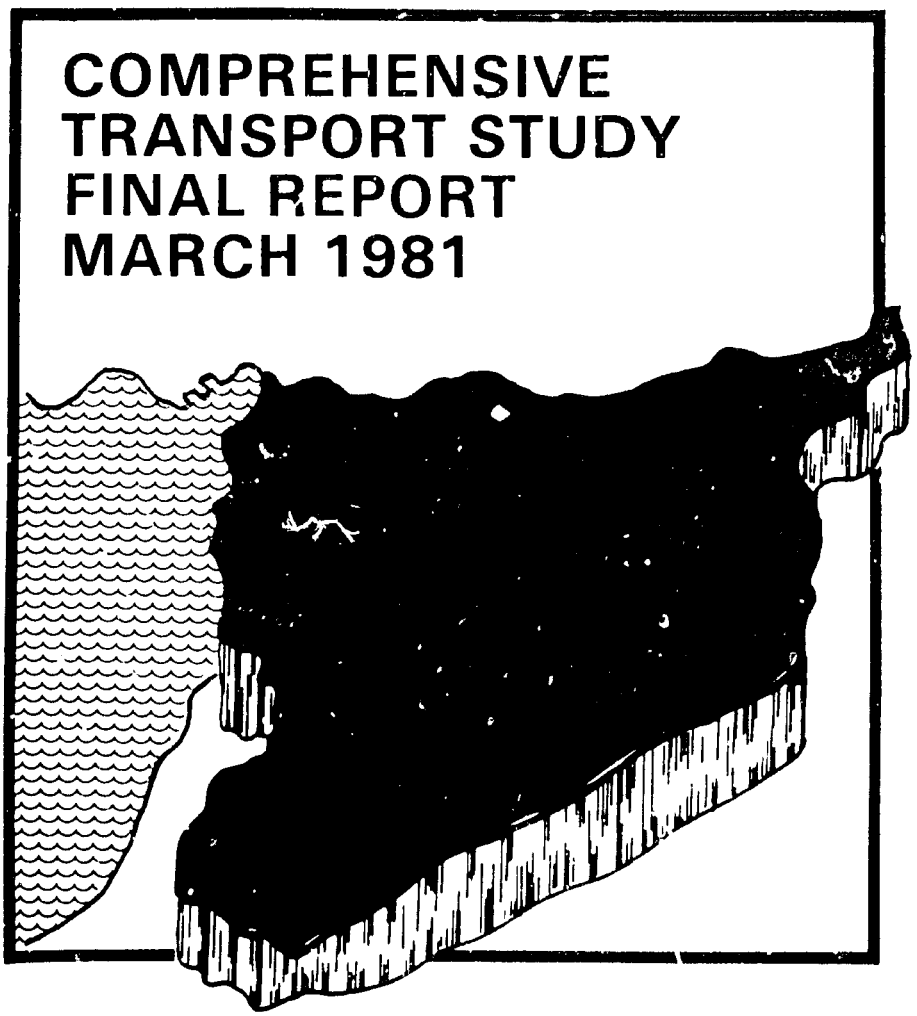

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This volume is one of seven produced as the Final Report for the Syrian Comprehensive Transport Study. The complete set of volumes is as follows:

Volume I	–	Executive Summary
Volume II	–	Transport Demand
Volume III	–	Railways
Volume IV	–	Roads and Road Transport
Volume V	–	Ports and Shipping
Volume VI	–	Other Modes and Related Industries (Aviation, Pipelines, and Construction and Storage Industries)
Volume VII	–	Transport Sector Plans

VOLUME V

PORTS AND SHIPPING

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A

PART A

ASPECTS COMMON TO BOTH PORTS

CHAPTER A - 1

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Chapter A-1

SUMMARY OF FINDINGS AND RECOMMENDATIONS

A-1.1 INTRODUCTION

The ports part of this volume deals only with the Ports of Tartous and Lattakia. Discussion of the oil terminals at Tartous and Banias is contained in Volume VI, Part II, Pipelines. This section, Section A, deals with aspects common to both ports. Section B deals with specific aspects of the Port of Lattakia, and Section C deals with the Port of Tartous. The port operations chapters of this volume, Chapters A-5, B-3, and C-3, are based on extensive observations at the ports in the latter half of 1979.

A-1.2 SUMMARY OF FINDINGS

Port Capacity

The major finding with regard to the Ports of Lattakia and Tartous is that, when the planned Tartous Port and the Phase I expansion of Lattakia are completed, Syria will have sufficient port capacity to meet its needs through the year 2000. Estimates of port capacity and forecasts of traffic through the ports are contained in Chapter A-6 of this section. The port capacities are based on average loading rates on a one shift per day basis. These rates should be achievable over time in Syria if recommended operational improvements are adopted. (Using two shifts, the Port of Tartous achieved 1.4 times the projected daily capacity per berth for general cargo in 1979.) An important factor in the Consultants' estimates is the apparent trend to increased containerization that is occurring in Syrian traffic as it is elsewhere around the world.

The Syrian phosphate traffic forecast for the year 2000 assumes that a major part of Syria's phosphate will be used for domestic fertilizer production. As a result, even if potential phosphate exports of 4.7 million tons per year from Iraq after 1990 materialize, the Tartous phosphate pier will have adequate capacity. In addition, the sulfur pier proposed for Tartous should be studied further.

Congestion Costs

Although the problem of port congestion is widely recognized, the costs are hidden. In Phase I the Consultants conservatively estimated that the direct costs in the form of liner surcharges and demurrage were being incurred at a rate exceeding SP 10.5 million per month. In fact, the rate may have been three to five times that amount. However, increased productivity at both ports had eliminated the waiting queues by the late summer of 1980.

Tariffs

A committee composed of the Deputy Ministers of Transport and Communications and the Directors of the Ports of Tartous and Lattakia has submitted for approval a proposed new tariff for the two ports. The proposed tariff, the first significant change since 1974, is a major improvement in terms of both structure and rates. It anticipates most of the changes the Consultants were planning to recommend and should be approved promptly, with minor modifications.

Operations

All three sections of this report contain recommendations for improving port operations. One of the most important overall factors is the lack of unitized cargo handling. There is an urgent need for pallets to be used for within-port cargo handling and for a significant increase in the amount of cargo that arrives in unitized, i.e , pre-palletized, pre-slung, or pre-bundled, form.

Inland transport is another big factor, and improved coordination of road and rail transport and other changes in present practices are required. (The problem and rail-port coordination is also discussed in Chapter A-2 of Volume III.)

Other important factors affecting port productivity include the need for better utilization of storage facilities; improved customs clearance procedures; and improvements in management, planning and training of personnel. A manpower development program should be instituted for both ports.

A-1.3 TARIFF RECOMMENDATIONS

The proposed tariff for the Ports of Lattakia and Tartous should be approved promptly, with the following modifications:

a. The tariff should require that the Joint Committee annually review the rates and submit its analysis and any recommendations through the Board of Directors of the Lattakia Port Company and the Administrative Committee of the General Company for Tartous Port to the Minister of Transport.

b. The pilotage and towage rates should be graduated, with a rate of SP 10 per meter for the first 220 meters in length and a rate of SP 6 for each additional meter in length.

c. The authority to increase tariff rates delegated in article two of the proposed tariff should be increased to a maximum of 50 percent.

d. No charges should be levied for the use of fork-lift trucks and tractors and trolleys inside the port areas.

A-1.4 OPERATIONS RECOMMENDATIONS

1. Cargo Handling

- Unitization of cargoes should be encouraged as far as possible. Specifications for Government cargoes should provide for import cargoes to be unitized, and private importers should be instructed to specify unitized packaging.

- Pallets should be acquired as soon as possible. They are the first step in handling unitized loads and are the preferred method for handling most break-bulk cargo.

- On large cargo vessels, fork trucks and pallets, where practical, should be used in the hold of the ship.

- Crane cycle time could be reduced if additional cargo slings were available and empty slings were picked up on the following crane cycle.

- In order to reduce cement ship delays, bagged cement should be pre-slung in reusable fiber net slings. The cement slings should be introduced at the manufacturer's plant and remain intact to the final destination.

- The present practice of discharging cement directly to trucks when trucks are available should be continued with the sling loads sized to the limits of the truck bed.

- The importers of lumber should require the shipper to package lumber in uniform lengths and widths.

- Placing chocking boards under lumber bundles either on the ground or in stacks will reduce strap breakage and manhandling of individual boards.

- Lumber bundles and other strapped cargo should not be lifted by the straps. The straps were not designed for lifting.

- When handling bundled strapped cargoes, whether on ships or quays or in the storage yard, a simple portable steel banding machine should be available for the immediate rebanding of broken straps.

- The practice of removing cargo from the transit sheds by toppling the goods onto the floor results in a high rate of breakage and recooperage. This practice should be stopped immediately.

- Priority for unloading should not be given to vessels under 300 tons.

2. Inland Transportation

- When palletizing and unit loading become the accepted practice in the ports, this method of handling should be encouraged in the inland movement of cargo.

- As new trucks are acquired, the ratio of trucks by size and type should favor the larger vehicles. This will allow fewer trucks to carry more cargo.

- Flat bed trucks, when available, should be used for transporting lumber bundles.

- Considering the large investment in rail facilities serving the ports, measures should be taken to encourage the handling of a greater percentage of port cargo by rail transportation.

- Grain movements to inland destinations will be optimized by bulk transport. Every effort should be made to provide sufficient bulk rail cars and trucks for this movement.

3. Storage

- The storage areas in the ports are unnecessarily congested. A number of steps could be taken to help relieve this congestion.

- Transit shed and warehouse supervisors should be provided with a storage plan layout. This will improve handling, sorting, and tallying and minimize delays in these activities.

- Immediate cleaning of the storage areas should take place after the handling and storage of individual cargo shipments have been completed.

- Cargoes in open storage should not protrude into the roadways or quay apron. Such practices narrow the maneuvering area for trucks and are another cause of delay.

- As an alternative to direct truck delivery, when sufficient trucks are not available, cargo should be palletized and stacked by forklift trucks away from the operations area in either open or closed storage areas, with the cost charged to the shipper.

- Although available open space for container yards is limited, ample room should be provided for the unrestricted movement of the handling equipment and trucks serving those areas.

- The ports should discuss with shipping agents the establishment of an interchange shipping pool for the back-haul

of empty containers. This will relieve the ports of having to provide space for long-term empty container storage.

- All imported cargo should be removed from the port within 30 days. The exception should be only for pre-arranged long term storage in a warehouse.

- Public sector companies in particular should be made aware of their contribution to port problems when they use the port facilities as long-term warehouses. Storage rates should be set at a level that will make long-term storage costs in the ports prohibitive.

4. Customs Clearances

- A practice of random sampling with heavy penalties for mislabeled goods would effectively reduce manpower requirements and expedite cargo movements.

- A separate in-depth study for the improvement of customs procedures should be undertaken. This should include an official exchange of customs officials with major trading partners for a review of more modern procedures employed in other world ports.

- Customs clearance should not take more than three days. If this cannot be accomplished by the present staff, additional customs personnel should be hired and trained.

5. Management, Planning, and Personnel

Management

- The port administrations should set production standards for different types of cargoes as obtainable goals.

- The ports should keep accurate records of cargo handling productivity on each ship. These records should be reviewed in order for management to take corrective action when called for.

- The port tallies should be compared with the ship manifest to insure accurate counts. Shortages should be promptly investigated.

- Every effort should be made to reduce unnecessary and redundant reports. It is recommended that a thorough study of the ports' paper work be made to simplify current record keeping and statistics with the aim of introducing computer systems.

- There should be annual or quarterly meetings arranged between the two ports for personnel in similar positions for the purpose of exchanging information on procedures, equipment, cargo handling methods, statistical analysis, engineering, maintenance, repair methods, and housekeeping. It is further recommended that exchange visits to other world ports be arranged for the same purpose.

- The port administrators should encourage their employees at every level to submit their ideas and recommendations for improved throughput, adding to the safety of the work force or reducing cargo damage. Suitable rewards for ideas that can be implemented should be made in proportion to their estimated value.

- Information on the number of trucks available and the ships to be worked with direct loading should be in the hands of the Port Operations Departments prior to the two daily planning meetings.

- Information and promotional material on the underutilized cold storage warehouses should be prepared and distributed to potential users and shipping companies serving the ports.

Planning

- Closer coordination and review of major projects should be established between Port Planning, Operations, Engineering, and Management and the Office of Major Projects. Port management recommendations and suggestions on port projects should be carefully evaluated by the Office of Major Projects, as there is much to be learned from practical operating problems that could be remedied by good design.

- Good statistical information should be provided for planning and management as tools for indications of problem areas and the effectiveness of port operational improvements.

- A copy of port statistical information with analyses of trends should be forwarded to the General Establishment for Major Projects, Office of Port Planning Department. This information is important for the establishment of port development priorities, such as fully developed container berths.

- Once computer reporting programs are introduced, they should be expanded in order to serve as useful tools for national port planning policy decisions and statistical analysis.

- The ports and the Ministry of Transport (MOT) should maintain a continuing review of container traffic to determine the priority for the construction of full container berths.

Personnel

- The ports should commence a management development program.

- The management development program should include counterpart specialists assigned to certain critical operational areas, which would include stevedore and transit shed operations, administration and finance, and port equipment maintenance and repair.

- Stevedore labor should be separated into two groups, one for vessel operations and the second for portage, with work areas being assigned as required. This will provide better utilization and flexibility of manpower.

- Equipment operators for vessel unloading should start at 6:00 a.m., obtain their equipment, and be prepared to start vessel operations at the same time as the stevedore labor force. The cost of overtime for equipment operators is more than offset by the manpower hours of productivity gained by the stevedore gang.

- A small team of expatriate port experts, including a training specialist, should be obtained through a technical assistance program to improve productivity of both ports. Each expert would be assigned one or more counterparts, the number depending on the nature of the work. Where possible, counterparts would be the line managers or supervisors directly responsible for insuring that any new practices and procedures relevant to the work were in fact implemented.

- The following expertise should be obtained as an integral team:

  - Team leader and coordinator/planner
  - Training and curriculum development
  - Modern cargo handling ship and shore
  - Security/safety and procedures - ship and shore
  - Specialized cargo operations and stowage
  - Administrative (claims handling, standards and procedures, customs, clearance, certification)
  - Accounting and finance
  - Documentation, equipment operations, and maintenance and parts control.

CHAPTER A-2

ESTABLISHMENT

Chapter A-2

ESTABLISHMENT

The two general companies, Lattakia Port Company and Tartous Port Company, that have been established to operate the two ports operate as relatively autonomous agencies.

Although the MOT is chartered to develop, promote, and coordinate the work of the organizations involved in transport activities, it currently has a minor influence over the port companies' activities.

The 1 June 1974 Legislative Decree 93 establishing the MOT attached the Lattakia and Tartous Port Companies to the MOT. As a result of the legislation, the Minister of Transport has appointive right of representation on the Board of Directors of the Lattakia Port Company and on the Administrative Committee of the Tartous Port Company. A discussion of the relationship between the MOT and its subordinate agencies is contained in Volume VII, Section 2.1.

Another agency that fulfills a minor coordinating function with the port companies is the General Directorate of Ports (GDP), headquartered in Lattakia. Although its chartered responsibilities include the supervision of navigation, maritime commerce, and port affairs, the GDP does not perform these functions for the Ports of Lattakia and Tartous.

Within this Directorate, the Port Affairs Department appoints a Harbor Master. In the case of Lattakia and Tartous, the Harbor Master does not perform the functions generally associated with this position.

The port companies are responsible for the entire operations, control, and maintenance of their respective ports, including:

- scheduling and control of ships in and out of the ports,
- loading, unloading, and storage of cargoes moving in and out of the ports,
- maintenance of all the facilities encompassed within the port areas - the buildings, docks, quays, roads, vehicles, and equipment - and the repair of ships as needed,
- security,
- sanitation,
- plans for the design and construction of new facilities,
- collection of ships and cargo fees and the control of same, and
- employment of personnel and the assignment of work.

CHAPTER A - 3

CONGESTION AND RELATED COSTS

Chapter A-3

CONGESTION AND RELATED COSTS

A-3.1 INTRODUCTION

This section presents the financial and economic costs at the Ports of Lattakia and Tartous. These costs include the costs of port operations and the costs of ships while at the ports (i.e., ship time costs at berth and while waiting to berth).

During the course of the study it has become apparent that the current costs at Tartous would not be valid ones for use for planning purposes.

The abnormalities caused by construction activity and the partial completion of the port, such as interference with cargo handling operations, lack of silo operations, and the resulting mix of cargo and vessel types, create temporary operational and ship time costs that will change considerably after the port construction is completed. Consequently, the Consultants have placed greater emphasis upon the study of Lattakia Port and consider the costs developed for Lattakia to be more relevant for transport planning than those from Tartous.

A-3.2 PORT OPERATIONS COSTS

To begin the determination of port costs, eleven centers of port operations have been identified. These are:

1. Pilotage and Towage
2. Anchorage and Berthing
3. Loading-Unloading
4. Porterage
5. Storage
6. Silo
7. Cold Storage
8. Power Plant
9. Public Utilities
10. Maintenance Workshops
11. Administration

The first seven cost centers are considered as production centers and the last four as service centers

Next the port's cost elements, both fixed and variable, were identified and classified according to the cost centers. A detailed listing of the individual cost elements for each center are presented in the financial chapters for each port.

As an alternative distribution of costs to that shown in Chapter A-4 and B-4 below, the costs are distributed by type in Tables A-3.1 and A-3.3. As can be seen from the tables, labor and related expenses are the largest cost items, accounting for 62 to 64 percent of the ports' financial costs. Furthermore, if depreciation were excluded from the totals as a noncontrollable expense, then the labor cost share of the port expenses would increase to 75 to 84 percent.

Economic costs are derived from these financial costs by the elimination of depreciation, the removal of transfer payments (e.g., taxes), and the adjustment of artificial items to their true economic value (e.g., increasing the cost of fuel). These economic costs are presented in Tables A-3.2 and A-3.4. As can be seen from these two tables, when the economic costs of the operation are considered, labor and related expenses increase to 78 and 83 percent of the total operation costs.

A-3.3 SHIP TIME COSTS

Through 1979, port congestion was a major problem at both Lattakia and Tartous. Additional fees for ship waiting time in the forms of demurrage and congestion surcharges have cost the country millions of dollars in foreign exchange. Since the costs of ship waiting time are passed directly to the cargo owners and do not appear on the port records, these costs have not been calculated or summarized by the ports for the country as a whole. Consequently, in Phase I, to study these time charges, the Consultants developed a computerized data base including every ship that docked at the Port of Lattakia during the period beginning January 1, 1978 and ending June 30, 1979. This data base incorportated more than 3,000 vessels and includes a measurement of the size, the number of tons imported and exported, and the time at port for each vessel. Computer programs were then written to organize the data and analyze it in several ways For example, size ranges of vessels at the port and the ship arrival patterns were developed.

Drawing on this data base, the Consultants estimated that during the period April 1 to May 31, 1979 a total of SP 13.9 million was lost due to ship waiting time charges. This figure may have been conservative. If all of the cargo involved had been added to compensate for port congestion, it would have totaled SP 70.6 million. This figure is obviously overstated, but the range indicates that the loss in foreign exchange to Syria due to port congestion was great. The analysis also indicate that trade offs between increased operating costs and reduced ship waiting time strongly favor the increased costs.

However, by August 1980 the situation had changed radically. As a result of substantially increased throughput at Lattakia and Tartous in 1979 and the first half of 1980, the waiting queue at both had effectively been eliminated - a commendable performance which produced substantial savings for Syria.

Table A-3.1

FINANCIAL COSTS BY TYPE: PORT OF LATTAKIA

Type	Cost (SP 000)	Percent of Total
Depreciation	8,729.6	15.4
Labor and Related Expenses[1]	36,176.0	63.8
Maintenance	3,855.5	6.8
Spare Parts	1,922.0	3.4
Fuel, Oil, Lube	1,050.5	1.8
Miscellaneous	4,990.0	8.8
Total	56,723.6	100.0

Source: Consultants' estimates based on Port records.

[1] Including salaries, overtime, allowances, bonuses, and social security.

Table A-3.2

ECONOMIC COSTS: PORT OF LATTAKIA

	Cost (SP 000)	Percent of Total
Fixed Costs		
Labor and Related Expenses	11,301.5	24.4
Maintenance	3,855.5	8.3
Spare Parts	501.0	1.1
Fuel, Oil, Lube	953.6	2.1
Miscellaneous	2,373.0	5.1
Total Fixed Costs	18,984.6	41.0
Variable Costs		
Labor and Related Expenses	24,874.6	53.7
Spare Parts	1,421.0	3.1
Fuel, Oil, Lube	1,042.3	2.2
Total Variable Costs	27,337.9	59.0
Total Port Operations Costs	46,322.5	100.0

Source: Table A-3.1.

Table A-3.3

FINANCIAL COSTS BY TYPE: PORT OF TARTOUS

	Cost (SP 000)	Percent of Total
Depreciation	10,614.7	26.3
Labor and Related Expenses[1]	25,151.3	62.2
Maintenance	1,160.7	2.9
Spare Parts	1,470.0	3.6
Fuel, Oil, Lube	535.3	1.3
Miscellaneous	1,496.4	3.7
Total	40,428.4	100.0

Source: Consultants' calculations based on port financial data and major projects agency records.

[1] Including salaries, overtime, allowances, bonuses, and social security.

Table A-3.4

ECONOMIC COSTS: PORT OF TARTOUS

	Cost (SP 000)	Percent of Total
Fixed Costs		
Labor and Related Expenses	7,981.4	26.4
Maintenance	1,160.7	3.8
Spare Parts	323.4	1.1
Fuel, Oil, Lube	255.7	0.8
Miscellaneous	1,495.2	4.8
Total Fixed Costs	11,216.4	37.0
Variable Costs		
Labor and Related Expenses	17,169.9	56.7
Spare Parts	2,246.6	3.8
Fuel, Oil, Lube	761.3	2.5
Miscellaneous	1.2	-
Total Variable Costs	20,179.0	63.0
Total Port Operations Costs	31,395.4	100.0

Source: Consultants' estimates based on port records.

CHAPTER A - 4

PORT TARIFFS

Chapter A-4

PORT TARIFFS

A-4.1 INTRODUCTION

Purpose of Tariffs

A port tariff or port pricing system is a mea of recovering from the users of the port all or part of the costs of operating the port. In the economic sense it involves a transfer of the benefits of port operation from the recipients - the ship owners and shippers - to the provider - the port authority.

In theory, the share of benefits that can be transferred is limited by the need to leave the user with enough net benefits to provide an incentive for him to use the facilities. From a practical point of view, however, this limitation applies more to individual port services, especially those that are price elastic, than to the use of the port as a whole, which is relatively price inelastic. A ship that is delivering freight to Syria has little choice but to use one of the ports and pay the required tariff charges.

A more practical limitation is the potential for retaliation by shipping lines. If charges in a given port are raised to a level that far exceeds the benefits, the lines will raise their freight charges accordingly. While this would not affect the revenues of the port authority, it would negate the benefits to the country as a whole. One proxy measure of port benefits that shipping lines can use to weigh the charges of a given port is to compare them with like charges in comparable ports. Because of this, a comparison of Syrian port charges with those of other ports in the region becomes an important measure of the upward limits, i.e., it becomes the foundation for a judgment as to what prices the traffic will bear.

Objectives

In accomplishing the basic purpose of a port tariff, there are several subordinate objectives that should ordinarily be met. The importance of these objectives varies, both among themselves and among ports, depending on the size and nature of operations of the port. These objectives include the following:

To Retain Benefits: The objective here is to keep the benefits of port operation within the country that is operating the port. This is of special interest in a developing country like Syria, particularly where costs, such as investments, involve the expenditure of scarce foreign exchange. This objective

underlies differences in port tariffs, in which higher rates are often charged to import and export shipping, thus giving he appearance of discriminating in avor of internal shipping and internal trade.

To Utilize Assets: The most efficient utilization of port facilities is another objective of a good port tariff. Use of an asset that is under-utilized may be increased by lowering the price, and thus increasing the benefit, to the user. Similarly, facilities whose capacity is fully utilized can be rationed by increasing the price to eliminate marginal users. In some cases these decisions are made for port functions that are relatively isolated from each other. For example, the use of transit sheds can be stimulated or discouraged by decreasing or increasing the price of demurrage. In other instances the decisions involve fungible services, and the price interrelationships must be taken into account - quay use versus lightering, for example. Traditionally, a tariff should be used to encourage transport efficiencies that are economically beneficial to the country.

To Cover Costs: A basic objective of a port tariff is to cover the recurring costs, both direct and indirect (such as depreciation), of operating the port. The objective is sometimes viewed as a lower limit in setting port tariffs, although in practice it cannot always be achieved. In 1978, with depreciation and assets based on book, rather than replacement, value, the Port of Lattakia more than met this test, showing a profit of SP 16.9 million on revenues of SP 73.6 million. This represents a return of 10 percent on the book value of the company's assets. However, these figures are somewhat misleading, since port operations in 1978 may have been influenced by low wages. (Identical operations at current wage levels -i.e., including the recently adopted Government-wide pay increases - would produce a break even situation, with no profit and no return on investment.) Moreover, if full costs are to be recovered, modern accounting practice suggests that the replacement cost of assets, rather than the book value, should be used. Under the present tariff and at present wages, this would produce a loss.

Liquidity: Another objective of a port tariff is to match income and expenditure to ensure that the port has cash available when it is needed to pay expenses.

Build Reserves: One other common objective of port tariffs is to build reserves, either against future fluctuations in income or to finance future improvements or expansion.

This objective cannot be met in Syria under present Government financial policy, as such reserves are withdrawn at the end of the fiscal year and put into the general revenues of the Government.

A-4.2 THE TARIFF STRUCTURE

Principles

The basic principle for an effective port tariff from the point of view of both the user and the port operator, but primarily the latter, is that it should be simple. There are limits, of course, as the simplest tariff, a single port charge, would run directly counter to the objective of maximizing the utilization of various facilities. But short of this, simpler is better. The simpler a tariff, the easier it is to calculate and collect the fees and to review and revise the prices. Ambiguities, and hence the chance for error, are less. Keys to simplification are to limit the range of charges and to use the simpler and less ambiguous measures for a given charge (calculating port dues by group of ship size is simpler than a per ton calculation, for example).

Background

In December 1979 a committee composed of the Deputy Ministers of Transport and Communications and the Directors General of the Ports of Tartous and Lattakia recommended a new joint tariff for the two ports. This tariff would replace the joint tariff that has been in force since 1974.[1] The new tariff was designed:

- to reflect and encourage the use of modern methods of sea transportation, such as containerization,

- to standardize charges collected by shipping agents,

- to simplify the charges, and thus simplify the data collection required for tariff purposes,

- to bring the Syrian tariff to a level comparable to that of neighboring ports, and

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[1]The only change in the tariff structure or rates since 1974 is a substantial increase in storage charges made effective 1 Jan. 1978 by Presidential Decree No. 2637 of 22 Dec. 1977.

- to increase charges to compensate for cost increases that have occurred since 1974.

The proposed tariff is a major improvement over the previous one and is to be commended. A comparison of the key components of the proposed tariff with those of other ports in the region and with ports throughout the world is shown in Table A-4.1. The table shows that the structure of the proposed tariff is generally consonant with tariff structures in the region and throughout the world. The basic components of the proposed tariff structure, and differences from the existing structure, are discussed in the following sections.

Vessel Charges

The proposed tariff retains the three principal vessel charges that are in the current tariff - a combined pilotage/towage charge, a mooring fee, and a berthing fee. The major change with respect to these charges is that the proposed tariff bases the charge on linear meters of overall vessel length (LOA) rather than on the net registered tons used in the current tariff. This is not in keeping with general practice in the region or the world, where gross registered tons (GRT) or net registered tons (NRT) are used by the majority of ports (86 percent in the region and 67 percent worldwide). This departure from the general practice may be justified in the case of Syria, where the two major ports do not levy port dues or light dues.[2] As a result, pilotage/towage fees and mooring/berthing fees are the two major charges levied directly on vessels. For the latter, vessel length is a more precise measure of facility use than either GRT or NRT. LOA also has the advantage of being an unambiguous measure of vessel size. (In a 1975 UNCTAD study, one-third of the ports sampled used length of vessel as the measure for berthing fees.[3]) If length is adopted for these reasons, then the principal of simplicity - using a single measure of vessel for all charges -argues that length should be used for pilotage/towerage as

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[2]These charges are levied by the Directorate General of Ports and are nominal in comparison to similar charges in other ports in the region or elsewhere in the world. In Syria they are levied on the quantity of goods loaded or unloaded from the ship, a very unusual practice; the usual measure is GRT or NRT.

[3]UNCTAD Secretariat, United Nations, Port Pricing, New York 1975.

Table A-4.1

COMPARISON OF MAJOR PORT TARIFF ELEMENTS

	14 Regional Ports (No. of Ports)	Ports World-wide (%)	Syria
A. Charges on Vessels			
1. Port Dues			
a. Levied	14	100	x[1]
Not Levied	0		
b. Basis - GRT	5	21	
- NRT	7	67	
- Other	2	12	x
c. Variations:			
By Size	4	n.a.	
Other (e.g. Seagoing vs. Coastal Vessels)	1	n.a.	
None	9		
2. Light Dues			
a. Levied	3	47	x[1]
Not Levied	11	53	
b. Basis - GRT	0		
- NRT	3	n.a.	
- Other	0		x
3. Pilot Dues			
a. Levied	14	97	x
Not Levied	0	3	
b. Compulsory	11	n.a.	x
c. Basis - GRT	2	28	
- NRT	10	39	
- Other	2	33	x
4. Berthing Dues			
a. Levied	13	52	x
Not Levied	0		
b. Basis - GRT	5	43	
- NRT	5	19	
- Per Vessel	0	38	
- Other	3		x
c. Time Period			
Per Day	10	63	x
Other Time Period	1	24	
Time Not Considered	2	13	
5. Mooring Dues			
a. Levied	6		
Not Levied	5		x
b. Basis - GRT	0		
- NRT	2		
- Per Vessel	4		

Table A-4.1

COMPARISON OF MAJOR PORT TARIFF ELEMENTS (continued)

	14 Regional Ports (No. of Ports)	Ports World-wide (%)	Syria
B. Charges on Goods			
1. Harbor Conservancy Dues			
a. Levied	6		
Not Levied	4		x
2. Wharfage (Loading and Unloading) Dues			
a. Levied	6[2]	n.a.[3]	x[4]
Not Levied	0		
b. Basis -			
- Weight tons	5		x[5]
- Measurement	0		
- Other	1		

Sources: Port Pricing, a report by the UNCTAD Secretariat, U.N. publication E75.II.0.7., 1975. Ports of the World, 32nd Edition, 1979. Ports of Cyprus-Tariff of Charges and General Information, issued by the Cyprus Shipping Association, undated. Proposed Tariff for the Ports of Lattakia and Tartous, draft Presidential Decree.

Notes: n.a. denotes not available. x denotes applicable to Syria in proposed tariff.

1 Levied by the Directorate General of Ports.

2 This figure may be understated, since the principal source, Ports of the World, is designed primarily for vessel owners and operators.

3 The U.N. study (see source above) states that loading and unloading dues are usually levied per weight ton of goods, with some ports reserving the right to use measurement tons where it is advantageous to the port. Sometimes the criterion used is the ship's manifest measure. Two methods of calculating the cargo-handling dues were noted. Either the rate applied was indicated for each product (the method in the 1974 Syrian tariff), or all products were divided into groups according to various criteria, which often take handling costs into account (this method is simpler and was found to be more common).

4 Included in comprehensive loading/unloading charge.

5 As stipulated in the bill of lading or ship's manifest.

well. However, the costs of pilotage and towage do not vary much with vessel size, and a charge that varies directly by size becomes more a measure of ability to pay than of cost of service.

The 1975 UNCTAD study found that "Pilotage, towage, berthing, and unberthing charges per tonnage unit of the ship decrease with the increasing size of the ship. This phenomenon may be attributable to the fact that the cost of the corresponding services depends only to a small degree on the size of the ship." The UNCTAD study found that, on the average, a ship of 7,500 NRT paid only 80 percent more in pilotage and towage fees than a ship of 2,500 NRT. This could be accommodated in the proposed tariff by varying the fee by ship size. If this is done, it should be done by category of size to keep the calculations simple. Whether the change should be made depends partly on the effect on revenue, which is discussed below.

In addition to the three principal existing vessel charges, the proposed tariff contains a small charge on goods, loaded or unloaded, to be levied on the vessel. This is a common port charge designed to cover general port costs rather than the direct cost of a particular service. Since the two port companies do not levy their own port dues, this type of charge is particularly appropriate for the tariff for Tartous and Lattakia.

Charges on Goods

The major changes in the proposed tariff and the most important improvements in the structure are in the area of charges on goods. There are two main changes:

- The number of different charges on goods has been reduced from six to three, as shown in Table A-4.2.

In the proposed tariff, silo and cold storage charges have been similarly simplified. One important aspect of the above charges is the discontinuance of separate quay charges for import and export. As the proposed tariff correctly notes, promotion of exports should be a function of government economic policy, not of a port tariff, whose purpose is to recover the costs of ser--ices rendered.

- The number of types of goods subject to different charges has been drastically reduced. For example, the present tariff lists 954 different categories of goods, each of which is subject to a different quay charge. The proposed tariff has only six categories under the new combined quay, loading/unloading, and porterage charge. Equally important, the basis for the categories has been fundamentally altered.

Table A-4.2

COMPARISON OF CHARGES ON GOODS

Present Tariff	Proposed Tariff
1. Quay charges	1. Combined loading and unloading, quay and porterage charge
a. Imports b. Exports	a. Direct Delivery b. Indirect Delivery
2. Loading and Unloading	2. Warehousing
3. Porterage	
a. Direct Delivery b. Indirect Delivery	
4. Warehousing	

The old categories were essential customs tariff groupings. The new categories are based on the type and extent of port services required and thus permit variation in charges in relation to costs and efficiency. The six categories are:

Category 1. Wood, iron, steel, pig iron, and unpacked bulk stone.

Category 2. Vehicles, mobile machines, and their trailers.

Category 3. Bulk liquids and materials handled by suction or pumping.

Category 4. All goods packed in bags, regardless of size or weight.

Category 5. Goods imported in containers, roll-on or roll-off vehicles, or trucks.

Category 6. All other goods regardless of how packed.

In the case of Lattakia and Tartous, the basic objective of most efficient use of port assets means primarily increased throughput to reduce demmurage surcharges. The categories in the proposed structure, which permit incentive rates for cargo that can be more efficiently handled, such as containerized and palletized cargo, are an important step in this direction. Elsewhere, this report recommends that the Government take steps to have the maximum amount of public sector cargo prepacked as a major step toward increasing port throughput. The demonstrated time savings for handling pre-packaged cargo justify a tariff concession from the point of port costs. Such a concession will help offset the additional costs of prepackaging for the consignee and thus encourage the private sector to adopt these practices.

The simplest form of concession would be a standard percentage reduction in the handling and transit charges due on goods.

Provisions for Change

The proposed tariff contains three specific delegations of authority for changes in the tariff. In each case the authority is delegated to the Board of Directors of the Lattakia Port Company and the Administrative Committee of the General Company for Tartous Port, with the proviso that there be prior consultation with the Joint Committee - a committee to be appointed by the Minister of Transport to coordinate the application of the tariff, to interpret it, and to propose amendments to it. The delegated authorities are:

- The authority to conclude special agreements for charges to be levied on imported or exported raw materials, such as phosphate, sulfur, lime, asphalt, petroleum, and coke. This authority apparently results from the fact that the phosphate loading facilities at Tartous are not operated by the port company.

- The authority to reduce charges on transit goods up to a maximum of 30 percent. This authority will enable the ports to remain competitive with other ports in the region.[4] Even if the full 30 percent discount were adopted, the resulting charges would represent a substantial increase in the charges on transit cargo over the existing tariff - an increase that is clearly justified.

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[4]The Port of Aqaba grants a 20 percent discount for transit goods, for example.

- The authority to increase or decrease any charges in the tariff up to a maximum of 25 percent, provided the changes are gazetted. This authority is essential if the tariff is to be kept current, a major problem with many port tariffs. But there are two apparent problems. First, the limitation of 25 percent is too low if frequent presidential decrees are to be avoided. An alternative would be a limit of 25 percent on reductions and 40 or 50 percent on increases. Second, this same authority is included in the present tariff and it has not been effective. As noted, the only change in tariff rates has been the 1977 increase in storage charges, and this required a presidential decree because the increase exceeded 25 percent. The remaining port tariff rates have remained unchanged since 1974, although wholesale prices in Syria increased 86 percent between 1974 and 1978. This section of the proposed tariff should be revised to require the Joint Committee to review tariff rates annually and to report the results of their review, through the Board of Directors of Lattakia and the Administrative Committee for Tartous, to the Minister of Transport. This would prevent a situation in the future where charges lag far behind increasing prices and costs.

Miscellaneous Charges

The proposed tariff also contains a minimum number of miscellaneous charges for such things as equipment rental, coopering, and weighing. The charges are standard ones and require no comment, except for the charge on the rental of fork-lift trucks and tractors and trolleys. While some ports in the area levy a separate charge for the use of such equipment, it is more general practice throughout the world for these costs to be covered by loading/unloading fees. The rationale is that using such equipment is to the advantage of the port, since it increases loading/unloading efficiency and thus throughput. Because of this, the use of such equipment should not be discouraged by levying an additional charge on the consignee or shipper of the goods. The proposed port tariff should be amended to limit the rental charges for fork-lift trucks and tractors and trolleys to the use of such equipment outside the port area.

A-4.3 THE TARIFF RATES

Regional Comparison

As noted at the beginning of this chapter, a comparison of Syrian port charges with those of other ports in the region is an important measure of the upward limits of a Syrian port tariff, i.e., a judgment as to what prices the traffic will

bear without retaliating with higher shipping rates. Table A-4.3 compares vessel charges, as opposed to charges levied on goods, for the proposed tariff for Lattakia and Tartous with the charges levied by fourteen ports in the region. Because the basis for calculating charges (e.g., NRT vs LOA) varies from port to port, the charges cannot be compared directly. The comparison in Table A-4.3 is based on the costs that would be incurred by a sample medium size vessel, whose characteristics are described in the table's notes.

A review of Table A-4.3 shows the following:

- The port and light dues levied by the Directorate General of Ports are far below those levied in the region; indeed, they are only 21 percent of the amount charged by the least expensive port. Since these dues in Syria do not accrue to the port companies, and since the Directorate General of Ports' costs are low, the Consultants have concluded that these rates should not be changed.

- Pilot dues for Syria would be the highest within the region, although this may be overstated since the Syrian charge is a combined pilotage/towage charge and some regional ports charge separately for towage.

- Berthing charges for Syria would be well within the range for the region, although above average, and mooring charges would be the highest in the region.

- Most important, the total charges levied on the sample vessel in Syria are well within the range of, and slightly below the average for, the other ports in the region. By this test, the vessel charges in the new tariff are reasonable and should not cause rate retaliation by the shipping lines.[5]

The UNCTAD study states that it was impossible to analyze cargo handling tariffs systematically because of insufficient statistical data. The Consultants have encountered the same problem with regard to a regional comparison of charges levied on cargo --the data are insufficient and the methods of charging too varied to permit a systematic analysis. However, two tests have been applied as a check of the combined cargo handling charge in the proposed tariff for Syria.

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[5]It should be noted that the above analysis does not include charges on goods of SP 5 per ton that are levied on the vessel in the proposed tariff. This is a normal port charge; for an average ship at Lattakia in 1978, it would have amounted to SP 3,980.

Table A-4.3

COMPARISON OF PORT VESSEL CHARGES
(SP)

	Regional Ports			Syria
	Range	Mean	Median	(Proposed)
Port & Light Dues Combined	512-2912	1,332	1,223	103
Pilot Dues	172-1280	695	656	1,340
Berthing Per Day	92-645	292	160	402
Mooring Per Day	16-160	60	32	268
Total Charges for Sample Vessel:				
On Berth for 5 Days	1607-5139	3,559	3,603	3,455
On Berth for 3 Days	1287-4102	2,920	3,058	2,651

Sources: Same as Table A-4.1.

Notes: Excludes charges on goods levied against vessel.

Calculations based on sample vessel with the following characteristics:

Dead Weight Tons.....10,000
Gross Registered Tons..... 8,000
Net Registered Tons..... 4,450
Length Overall (meters)..... 134

Currencies converted at market rates 1 February 1980.

First, the combined handling charge for a ton of general cargo in the proposed tariff has been compared with total charges for similar services in the ports of Cyprus and the Port of Aqaba--both cases where sufficient data are available to calculate a total charge comparable to true proposed combined charge. In this comparison the charges are comparable.

Second, assuming that the share of the new combined charge that represents quay transit dues is comparable to the ratio in the old tariff, the Consultants have calculated total port dues on vessels and on cargo for Lattakia under the proposed tariff. The calculation shows that 18 percent of the port dues (i.e., excluding charges for specific services such as porterage) are levied on the vessel and 82 percent are levied on the goods. This is within the mean and median range for other ports according to the UNCTAD survey.

While not conclusive, both of the above tests indicate that the charges levied on cargo in the proposed tariff are reasonable in comparison with other ports in the area and elsewhere in the world.

Comparison with Costs

The Consultants have prepared a cost and revenue comparison for the Port of Lattakia based on the proposed tariff. The comparison is based on the following assumptions:

- Operations are assumed to be at the 1978 level in terms of number of ships, ship size and type, and number of mooring and berth days and in terms of volume of cargo, cargo mix by type proportion of direct delivery, and amount of goods stored.

- Wages are assumed to have increased in proportion to the recently enacted Government-wide salary increase.

- Other variable costs are assumed to have increased by 15 percent, and depreciation has remained constant.

- No discount is assumed for transit traffic.

The results of this comparison are shown in Table A-4.4, but it should be emphasized that this is a broad comparison for tariff evaluation purposes only. The comparison is not an attempt to forecast revenue and expenditures for 1980 or any future year. A review of the comparison shows the following:

- Revenues would substantially exceed costs. The comparison shows a total profit of SP 56,886,000 on revenues of SP 133,918,000. These figures indicate that the proposed tariff

Table A-4.4

COMPARISON OF COST AND REVENUES: LATTAKIA PORT COMPANY
(1978 Operations at 1980 Prices and Costs in SP 000)

Cost Center	Projected Costs	Projected Revenue	Profit or (Loss)	Profit or (Loss) As Percent of Revenue
Pilotage and Towage	3,886	2,161	(1,725)	(80%)
Anchorage and Berthing	1,162	1,986	824	41%
Loading and Unloading[1]	50,556	99,000	48,444	49%
Storage	17,746	29,274	11,528	39%
Silo	2,217	1,394	(823)	(59%)
Cold Storage	1,465	103	(1,362)	(1,322%)
Total[2]	77,032	133,918	56,886	42%

Source: Consultants' estimates.

1 Includes costs of present loading-unloading and porterage cost centers.

2 Includes allocated costs of service centers.

rates, overall, are clearly adequate to cover current costs, although the profit figure is certainly overstated. It is overstated primarily because the cost assumptions used are conservative. This is especially true for labor if the the type of competitive incentive wage plan, recommended elsewhere in this report, is adopted. (Labor costs presently account for more than 60 percent of total port costs.)

- The ports' profit comes from the combined loading/ unloading charge and storage. These two revenue centers, in this order, are the major producers of income in ports generally.

- Three cost centers show losses - pilotage/towage, cold storage, and silo - in that order. The apparent loss on pilotage/towage may be substantially overstated since the costs for this center are not available directly from the port's accounting system and allocation of various costs to the center has been a matter of judgment. The fact that pilotage/towage charges in the proposed tariff are relatively high, and the operations relatively simple in Lattakia, supports this conclusion. The same situation does not apply to the silo and cold storage centers. Even if all allocated costs are removed from the silo centers costs, it would still show a loss. This situation may change if the Consultants' recommendations for mechanization are adopted. But this is not possible for cold storage, where the basic problem is under-utilization. Charges cannot be increased enough to make up for this, and the proposed fixed storage rates, regardless of the duration of the storage, are proper as a means of increasing utilization.

Revenues at Tartous

While a similar comparison of projected costs and revenues has not been made for Tartous Port, the effect of the proposed tariff at Tartous should be similar to that at Lattakia, and perhaps somewhat more favorable. Table A-4.5 compares total and unit revenues by cost center for the two ports. The table shows that pilotage and towage, and anchorage and berthing unit, revenues are somewhat higher at Tartous than at Lattakia. The other unit revenues are comparable. Total revenues at Tartous are substantially less because of less total revenues from storage. This reflects the higher proportion of roll on/roll off traffic and lesser storage capacities now available at Tartous. Total costs at Tartous are lower than those at Lattakia, by almost the same amount as revenues, for the reasons discussed in Section A-3 above. As a result, the overall effect of the proposed tariff and increased costs should be similar.

Table A 4.5

COMPARISON OF COSTS AND REVENUES AT TARTOUS AND LATTAKIA, 1978

Cost Center	Total Revenues Per Cost Center (SP 000)		Revenues per Unit of Work by Cost Center (SP)	
	Tartous	Lattakia	Tartous	Lattakia
Pilotage & Towage	2,211	1,523	1,285	750.3
Anchorage & Berthing	1,005	795	584	391.6
Loading - Unloading	24,104	22,154	11.1	12.4
Porterage	15,087	14,544	6.9	8.2
Subtotal	39,191	36,698	18.0	20.6
Storage	15,327	33,522	46.4	47.0
Silo	-	721	-	16.0
Cold Storage	-	340	-	81.8
Total Revenues	57,734	73,600	26.5	41.3
Total Costs	40,429	56,724	18.6	31.8

Source: Consultants' caculations based on port and major projects agency records.

Specific Rates

Several of the specific rates in the proposed tariff merit further discussion.

Pilotage and Towage

As noted earlier, pilotage costs do not vary proportionally with ship size, and varied rates by size category are the rule in ports generally. Although this cost center might show real loss at Lattakia under accurate accounting, the Consultants believe that a more reasonable alternative to the proposed tariff rates would be:

Ships up to 110 M LOA	SP 10 per meter for the first 110 M LOA
Ships over 110M LOA	SP 6 per meter for each additional meter LOA

The alternative would reduce total pilotage and towage revenues at the two ports by less than 5 percent, a minor amount in relation to total revenues.

Loading/Unloading

For the reasons discussed in Chapter A-5 above, the Consultants strongly support efforts to increase pre-packaged (pre-palletized, pre-slung, and pre-bundled) cargo. To encourage this, the proposed tariff should allow a discount of 30 percent - which is proportional to the direct cost and time savings involved - on all such pre-packaged cargo. However, this discount should not apply if the cargo must be unpacked on the quay. Because the cost savings will be proportional, the overall effect on revenues will be negligible.

The present accounting system does not permit a precise comparison of the cost of handling goods on direct delivery with the cost of handling them through the transit warehouses. However, the available evidence suggests that direct delivery is much less expensive than the differences in charges shown in the proposed tariff. This question must be analyzed further, but as a minimum, the proposed tariff should be supported by regulations that allow the ports to place goods in transit storage whenever direct delivery vehicles are not immediately available and to levy loading/unloading charges accordingly. The ports cannot afford to allow the unloading process to stop to wait for trucks or rail wagons.

Silo

Because the silo cost center continues to show a loss under the proposed tariff, the Port of Lattakia should review the costs and charges for silo operations after some experience has been gained with mechanized operations.

Cold Storage

Although this cost center shows a large proportional loss, the storage prices should not be increased lest they further discourage utilization. Contracts for outside use may require use of the tariff reduction authority that has been delegated to the Port Directors.

CHAPTER A - 5

OPERATIONS

Chapter A-5

OPERATIONS

A-5.1 INTRODUCTION

The Ports of Lattakia and Tartous are in some ways similar and in some ways dissimilar in their operations. This chapter discusses those aspects of the port operations that are similar or identical and contains recommendations applicable to both ports. The two subsequent chapters deal with operations in each port individually and contain specific recommendations for each port in recognition of the variation in types of cargoes handled, physical layout, condition, and state of development of each port.

Owing to the lack of historic information and in some instances meaningful statistical data, such as cargo handling productivity, number and types of trucks serving the port, rail wagon loadings, and numbers of passenger ships and passengers, some significant information had to be extrapolated or estimated.

It should be noted that a number of observed operational improvements took place between the in-port studies in July 1979 and a more recent visit to the ports in January 1980. These observed improvements included better utilization of warehouse space, increased use of rail wagons, palletized handling with available pallets, improved cycle time of cargo handling between ship and quay apron, and in Tartous, better coordination of truck movements for directly delivered cargoes. These improvements are reflected in increased throughput at the ports.

A-5.2 ARRIVAL PROCEDURES

While the standard procedure is for arriving vessels to take their turn at the end of the waiting queue, some vessels are granted priority to those in the queue.

The one category that is particularly striking is vessels with less than 300 tons of cargo. The rationale for this priority group, as explained by the port management, is that smaller vessels have a lower number of tons over which to spread delay costs and, therefore, cannot afford the costs of waiting in a queue as well as larger vessels can. While the logic of this reasoning is valid, it is based on a short-term outlook that is far outweighed by the negative long-term impacts of this priority. This special priority for small ships provides an economic incentive for cargo owners to use small ships on new imports and, in the extreme case, to transship cargo from larger

vessels into smaller vessels just before arrival at Lattakia (e.g., at Cyprus). Since larger vessels tend to have better loading and unloading efficiency than smaller vessels, the behavior that is encouraged is detrimental to port operations and reduces total port throughput. Consequently, vessels carrying less than 300 tons of cargo should no longer be granted priority.

A-5.3 CARGO HANDLING LABOR

The cargo handling labor force comprises permanent workers employed on a monthly basis and casual workers hired on a day-to-day basis as required. The regular workers are divided into three main groups in Lattakia and four in Tartous. Each group is divided into two sub-groups, one group performing the unloading and loading of cargo aboard vessels and the other group performing work on shore and in the storage areas (porterage). In Lattakia there is no interchanging of workers between the two sub-groups or between the main groups. In Tartous, the workers can be interchanged as required. The total number of permanent workers allowed is set by the Government.

The division of labor into three groups at Lattakia and four at Tartous was intended to simplify the management and administration of the labor force. However, the division of the ports into corresponding sections has at times led to inefficiencies in port operations. For example, the vessels at berths served by one group may not have adequate labor at hand while those served by another group have excess labor that is not being used effectively. Similarly, if the warehouses for the berths of one group are full, the vessels at those berths might sit idle even though space might be available at warehouses served by another group.

For better utilization and greater flexibility, the labor forces at both ports should be reorganized into two groups, one for loading and unloading vessels and one for porterage. Each group would have the responsibility for supplementing its regular work force with casual workers as needed and servicing all berths in its port. There would be no artificial division of port areas.

A-5.4 UNLOADING AND LOADING

In handling import break-bulk general cargo and using the electric cranes on the main quay, workers manually place the cargo in a sling or on a port pallet (except pre-palletized cargo) and hoist it onto the quay by the crane close to a transit shed doorway or directly to a truck. If the ship is adjacent to one of the three-story transit sheds, the crane can land its load on either of the two top floors.

Considerable time delays occur at this point because of the manhandling and the use of hand trucks for moving the cargo into the sheds. For export cargo the same procedure is used in reverse. Additional time is lost while the crane waits idle for the empty slings to be returned to the ship. Crane cycle time could be reduced if additional slings were available and the empty sling were picked up on the following cycle.

With pre-palletized or palletized cargo, the only requirement in the hold is to secure the pallet sling to the pallet. The crane can then place the pallet on the apron and immediately return to the ship. The pallet is moved into the shed by fork truck and is stacked. Lighters and conventional ships at the other quays, in general, follow the same procedures, except mobile cranes are required to unload the lighters.

A-5.5 IN-PORT FACILITIES

Open Storage

Cargo stored in open areas should be kept off of the roadways and quay aprons. Cargo in open storage protruding onto the roadways and quay aprons causes difficulties in maneuvering trucks on reduced roadway widths, particularly on the quay aprons, where trucks must be positioned for direct delivery. This practice should be corrected as it represents another delay factor.

Container Storage Yards

Container storage and handling areas are too confined. Open areas between stacked containers are not wide enough for the large fork truck with automatic pick-up spreader to maneuver with ease. As a result, considerable time is wasted in aligning the spreader and fork truck with the top of the container. Truck aisles are too narrow, particularly in the turning areas. Again, instead of a free flow of truck traffic in and out of the container yards, there are additional delays required by the trucks negotiating the turns. Although available open space for container yards is limited at this time, ample room should be provided for the unrestricted movement of the handling equipment and trucks servicing the yard. Once the yard is properly laid out, guidelines should be painted on the yard surface to indicate the stacking areas.

Transit Shed and Warehouse Storage and Handling

There has been a noted improvement in the use of transit shed and warehouse cubic space. However, until pallets are employed, hand stacking and hand carts continue to be the accepted method for cargo handling. When cargo is being removed from the warehouse, the top boxes, containers, or crates are pushed over and

fall to the floor. This practice should be stopped as it results in a high degree of packaging damage, cargo breakage, and the need to recooper the packaging.

Warehouses and transit sheds should be provided with a storage plan layout. Guidelines for such plans are as follows:

- Storage bay boundaries should be clearly designated by the support columns or by 8 centimeter floor line markings to provide easy and accurate bay identification, storage, and aisle limits. Individual bays should be numbered in a sequence best adaptable to the physical characteristics of the shed or warehouse.

- The main aisle, running the entire length of the shed, should be wide enough to permit easy passing of two forklifts carrying loaded pallets 160 centimeters in width, requiring a width of approximately 4.15 meters.

- Cross aisles running the width of the shed bisect the main aisle. These aisles should be approximately 2.25 meters in width. Elevator aisles should be at least elevator width with an open area at the elevator door of approximately 3 meters - 4.5 meters.

- Miscellaneous aisles: aisles leading to light switches, plug-in sockets, etc., should be limited to 45 centimeters.

A-5.6 TRANSIT SHED AND WAREHOUSE HOUSEKEEPING

The fundamental rule of good housekeeping is that clean-up action should be considered as a part of the operation itself and carried out progressively rather than at periodic intervals. The proper time to clean up debris, spilled cargo, scrap, etc., is as soon as practicable after handling operations. Some of the major benefits derived from good housekeeping are:

- conservation of space, time, and effort,
- protection of the cargo,
- elimination of accidents and fire hazards,
- help in controlling rodents, and
- increased employee morale.

A-5.7 COMMENTS ON PRESENT HANDLING METHODS

Handling

Inept and careless handling and storage practices cause a series of delays and cargo damage that when added together are a primary reason the ports' cargo throughput is not reaching

acceptable standards. Each incident of improper storage and stacking or breakage of pre-palletized cargo, strapping bands, cartons, crates, barrels, and bags compounds the handling problem at each stage of cargo movement.

Poorly unitized cargo loaded onto trucks causes additional labor and time for the unloading at destinations. This, in turn, adds to the truck turnaround time and consequent reduced trips per year, leading to truck shortages. The lack of wood chocking under large crates or between stacked bundles makes it difficult to engage fork truck blades for movement without either damaging the cargo or breaking the strapping, resulting in additional time and labor to hand load piece by piece instead of as a unit. Heavy boxes stacked on top of light cartons crush the bottom containers, requiring additional labor to recooper the contents. Restricted transit shed aisles and open storage operating space cause time-consuming equipment and truck maneuvering and delays. Unattended trucks and port equipment parked on the quays and roadways restrict vehicle passage. Cargo stored in open areas that protrudes onto the road or quay limits vehicle access or maneuvering areas and is again a source of delay. Trucks and port equipment using the wrong side of the roadway or gates causes traffic confusion. These examples of poor handling and operational procedures, which could easily be corrected, should be brought to the attention of the first line labor supervisors.

Truck Availability

Delay to direct delivery operations because of the limited availability of trucks is one of the most serious problems at the port, resulting directly in slower turnaround time for the vessel at berth and indirectly in additional waiting time for all ships. Recommendations for improving truck availability should be given the highest possible priority. Additionally, procedures should be instituted to ensure that unloading operations are not delayed at those times when trucks are not available and ready to receive cargo.

In particular, it is recommended that when cargo cannot be immediately loaded into a waiting truck it be immediately palletized and moved into the nearest transit shed or warehouse. This will detract from the efficiency of direct delivery to some extent and will also create disputes because of the imposition of charges for involuntary porterage and warehousing of cargo. However, in view of the extreme costs to the country arising from excessive waiting time, the benefits accruing from reduced vessel turnaround time will more than compensate for the drawbacks of such a policy.

Tallying of Cargo

Importers claim that there is a high incidence of cargo shortages caused by cargo destined for the ports being left aboard the ship but recorded as unloaded. Increased attention should be paid to the tally by the cargo handling supervisors, and the port tally should be compared to the ship manifest to ensure against vessel overcarriage of goods.

Storage

At the end of each month each Warehouse Chief takes an inventory of the shipments in his warehouse and submits it to the Warehouse Section of the Operations Directorate. On the average, in the Port of Lattakia, the age of the cargo in storage was:

- 50 percent 1 to 3 months,
- 25 percent 3 to 5 months, and
- 25 percent 6 months or longer.

Except for pre-arranged long-term storage, all incoming cargo should be out of the port within 30 days.

Since 1 January 1979 these inventory reports have been summarized and published in formal form. This summary lists the ownership, commodity, and tonnage and shows the tonnages in storage by the Government and private sector, and in-transit cargo and their percentages. A review of these reports shows that the private sector, the Government, and the in-transit average percentages were 54, 43, and 3 percent, respectively. Between the end of December 1978 and the end of June 1979, the total amount in storage had more than doubled. The largest increase was in the private sector portion, which rose by 250 percent. It is concluded that this increase in long-term storage results primarily from low rates. Storage rates should be increased.

While it may be convenient for public sector companies to use the ports as long-term warehouses, such practices contribute to the ports' problems of congestion, lack of storage space, and consequent vessel delays. The public sector companies should be made aware of their role in creating port operational problems and make every effort to clear their cargoes within a maximum of 30 days.

A-5.8 CUSTOMS PROCEDURES FOR RELEASING CARGO

The number of packages opened for inspection is at the discretion of the customs officials and should depend primarily on

the size of the shipment and the nature of its contents. Customs procedures call for a 10 percent inspection of individual shipments if there are no noted discrepancies. However, in many cases this percentage is exceeded. The practice of opening every box of uniform shipment is not necessary. A practice of random sampling, with heavy penalties for mislabeled goods, would be effective and less time consuming. The entire customs clearance procedures should not take more than three days, with a goal of one day clearance to be achieved in the near future. If this cannot be accomplished by the present staff, additional customs personnel should be hired and trained.

Direct truck-delivered and roll on/roll off cargoes are precleared and a quick inspection is made by customs as the cargo leaves the ship.

Present policy in the ports allows for six months storage after the arrival date. Storage reports are submitted to customs on a monthly basis with goods in storage for six months noted. Customs must then notify the central office in Damascus and receive authorization to send the importer a warning letter that the goods will be confiscated unless removed. If for some reason the importer does not receive the letter, customs cannot proceed. If customs confiscates the goods for auction, the importer has the right to remove the goods from auction or purchase the goods at the auction.

This same procedure applies to damaged goods. The auction of goods must bring a price that will cover storage handling costs and customs fees. Monies obtained over and above these costs are reserved in a special account for payment to the importer.

Public sector goods in long-term customs storage cannot be sold at auction to the private sector. As a result, the warehouses are gradually accumulating large amounts of long-term stored goods that are occupying much-needed port storage space.

It is apparent that these procedures are time consuming and cumbersome. From a customs clearing agent's view, the customs practices are arbitrary in that full manifest quantities are charged for even though there are shortages, with the assumption that all problems are caused by the vessel and the importer and they are therefore responsible for full payment.

A separate in-depth study of current customs procedures should be undertaken. The present review of customs practices indicates that they are cumbersome, overly time consuming, and a major factor in limiting port storage capacity. Further, these practices do not reflect current and more practical methods. Official exchange visits of customs officials of major trading

partners should be arranged for the purpose of exploring more modern procedures.

A-5.9 UNIT LOADING

General Cargo

At present, and until the ports' planned expansions are completed with specialized vessel berths (e.g., container ship terminals), the main port quays serve as multipurpose general cargo berths. The ports must therefore provide a variety of equipment and handling facilities for general cargo ships with a large mix of cargoes. In order to accomplish this, cargoes arriving in the port must be handled by the most modern methods. The most efficient method is to handle these cargoes in larger lot sizes by unitizing as much of the cargo as possible and handling with machines.

Unitizing takes many forms. The 20 foot and 40 foot containers and lighters aboard ship (LASH) are two of the larger forms of unitized cargo. Additional methods of unitizing are by slings, pallets, strapped bundles, and large machinery in crates that can readily be handled as a unit by cranes and fork trucks.

The ports are not yet taking full advantage of unit loads. Unitized cargo arriving in the ports, either strapped to a pallet or in the form of a strapped bundle, e.g., lumber, is often unstrapped and manhandled by individual pieces. Large crates are landed on the quay aprons without chocking, causing considerable damage by fork trucks ramming the blades under the crate. By not unitizing or taking advantage of those cargoes that are pre-unitized, the ports suffer the following consequences:

- Handling costs are increased.

- The time required for loading and unloading is increased.

- The cycle time of cargo handling equipment is delayed from both ship and lighter with corresponding higher costs and delays in turning the lighter, leading to lighter shortages.

- The extra manhandling causes increased damage to the cargo with corresponding higher insurance costs.

- Pilferage is increased.

- Sorting of cargo requires additional time.

- The delays to vessels loading and unloading cause excessive vessel waiting time and port congestion.

- Vessel delays cause higher freight rates, surcharges, and demurrage costs.

As newer and more expensive ships are used in Syrian commerce, the costs of waiting time will continue to increase. More efficient and expedited cargo handling must be practiced to offset the higher costs.

The Syrian General Authority for Maritime Transport has the authority to include specifications for Government imports and exports. These specifications should, to the extent possible, provide for import cargoes to be unitized or crated and boxed for unit handling and fork truck operations. To encourage private importers, unitized cargo should be charged a discount handling rate.

Palletization of Cargo

Reference has been made in several sections of this report to the suggestion that the Ports of Lattakia and Tartous convert to a pallet system whenever possible in the following operations:

- transferring cargo between ships, transit sheds, and open storage areas,

- stacking cargo in these sheds and open storage areas,

- unstacking and delivering cargo to truck and rail transport, and

- delivering directly to transit sheds or open storage when the ship is delayed.

The advantages of palletizing are:

- more efficient use of the storage areas' cubic space,

- reduction in the number of manual handlings of the cargo,

- reduction in damaged cargo,

- reduction in pilferage,

- increase in productivity, thus reducing ship's time at berth and increasing berth utilization, and

- reduction in ship waiting time.

Palletized handling of cargo greatly reduces the number of times the cargo is manually handled and the number of people required to transfer the cargo from the ship's hold to the transit shed for storage and to deliver the cargo from storage onto the cargo owner's transport. An average comparison between hand trucking and forklifts is presented below. (See also Figure A-5.1.)

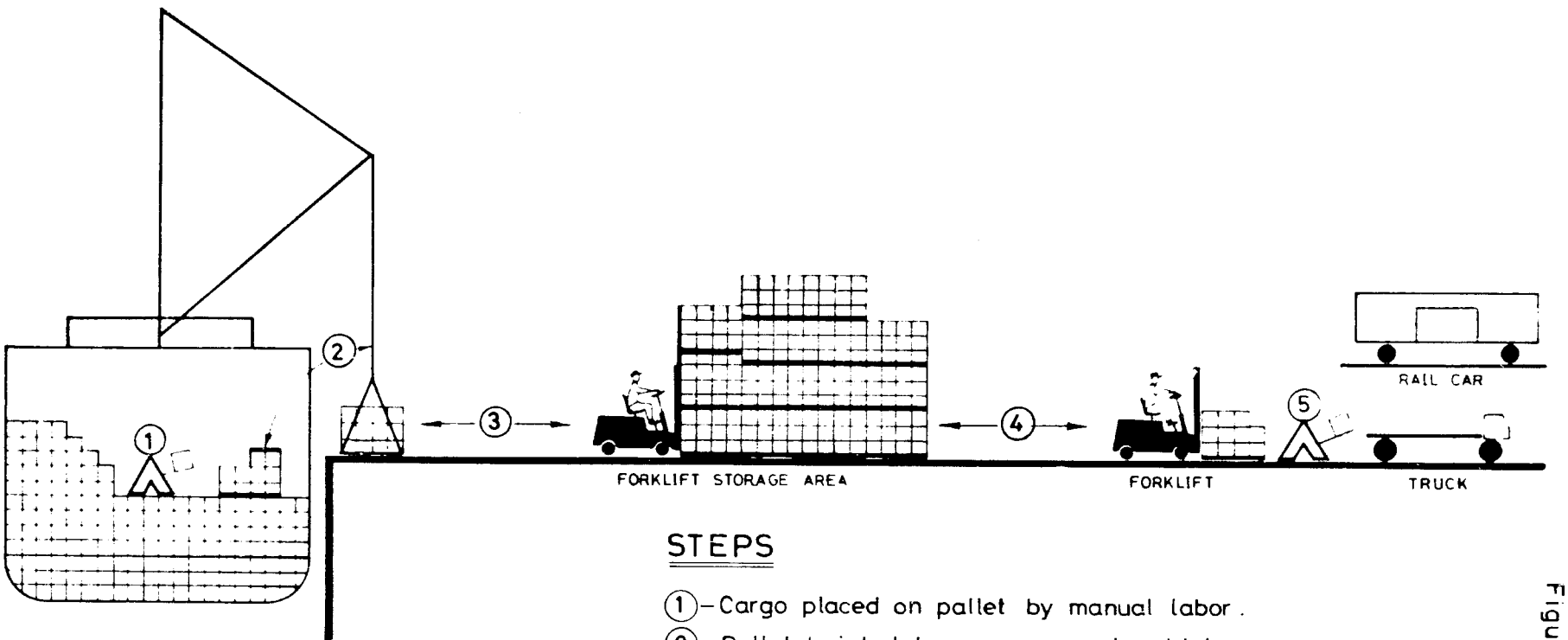
	Manual Handlings		Pallet Handlings	
	Workers		Workers	
Operation				
Transfer from place of stow in ship to sling or pallet	x	6	x	6
Load hand trucks on quay apron and transfer to transit shed	x	6		2[a]
Stack in shed 3 m high	x	4		
Unstack in shed, deliver to cargo owner's transport	x	8		2[a]
Load transport	x	2	x	2
Totals	5	26	2	12

[a] One lift driver and one pick-up man to pick up any packages that fall from the pallet while being transported.

The recommended pallet size for in-port handling is 120 x 160 centimeters. This size pallet is capable of supporting loads up to three tons.

The estimated number of pallets initially required at the ports is shown in Chapters B-1 and C-1 of this volume.

PALLETIZED CARGO HANDLING SYSTEM



STEPS

1 – Cargo placed on pallet by manual labor.

2 – Pallet hoisted to quay apron by ship's gear or quay crane.

3 – Pallet transported to storage area and stacked by forklift.

4 – Pallet unstacked and transported from storage area by forklift to truck or rail car loading platform.

5 – Cargo removed from pallet and loaded onto truck or into rail car by manual labor.

NOTE: In a loading operation the steps are the same but in reverse order.

Figure A – 5.1

Empty pallets may also be stored along the wall on loading platforms provided the platforms are of ample width and sufficient operating space is maintained for the movement of cargo handling equipment.

Reserve stocks of pallets should be stored in outside storage areas and protected from the weather.

Lumber Bundles

Much lumber is imported in steel-prestrapped form, to be handled as a unit load. The rough handling these units receive, particularly when lighted from the ship to the quay, often breaks the straps. Placing chocking boards under the bundles either on the ground or in stacks would cut down strap breakage and provide easy access for fork truck blades.

It was also noted that, in the direct delivery of packaged lumber to trucks with sideboards, the men on the trucks were cutting the bundle strapping and hand stowing the individual pieces of lumber on the truck. A mobile crane can service two trucks alternately, but the men on the trucks cannot keep up with the crane and there is a seven minute delay in each crane cycle. The breaking up of the bundles was apparently done to get more stowage on the truck as the lumber bundles contained some pieces of varying lengths. This breaking up of the bundles at the port defeats much of the efficiency of the unitized load system.

When bundled lumber is being handled either on ship, quay, or storage yard, a simple steel portable banding machine should be available for the purpose of the immediate rebanding of broken bundles.

Unit Unloading of Cement

In order to improve the safety and health aspects of cement handling, plastic fiber web slings should be used, which would substantially reduce damage to the bags. Their use does not require any further investment in handling equipment. Sling loads can be readily removed by ship's gear and fork trucks.

The most economic approach to the use of these slings is to introduce them at the manufacturing plant. From there, they should be delivered to the loading port and shipped as a unit load through the discharge cycle, continuing to the point of destination. Under the Syrian Government purchasing program for cement, the initial supply of the slings should be delivered to the supplying manufacturers of the cement with instructions

that they be used on cement bags being shipped to the ports. The slings may be reused and should be returned to the shipper. This can be accomplished by classifying them as ship's gear. This is particularly practical when using a long-term ship charter.

Once the cycle of sling usage is started, the vessel can be used to ship empty slings back to the cement supplier. It should be noted that once reusable slings are introduced, a careful inventory of the slings must be taken and a rigid inspection of the reused slings be undertaken in order to detect any damage that may have occurred.

A-5.10 QUAY CRANES AND SHIP GEAR

There are no guidelines for consistent strategies applied to the decisions of when to use the ship gear or the electric quay cranes. The following guidelines are recommended (based on type of cargo):

- Direct delivery: Quay cranes are recommended for all direct-delivered cargo. The important advantage here is that quay cranes can load two trucks or rail cars at a time, while ships' gears can load only one truck and must wait for the next truck to position itself before loading.

- Non-palletized cargo: Quay cranes are also recommended for this cargo category. The advantage is their ability to place cargo in several different positions on the quay, which ships' gear cannot do.

- Palletized cargo: The use of ships' gear is recommended for this type of cargo. Their faster cycle times make their use superior to that of the quay cranes.

The standard movement of palletized cargo from ship to quay to warehouse should be a smoothly operating and highly efficient procedure. As the ship's crane places the pallet alongside the ship, a forklift truck should immediately lift it and move it into the warehouse.

- Upper level storage: While long-term storage is to be strongly discouraged, there are times when it is unavoidable. At these times the use of the second and third floor of the three-story warehouses becomes justified. The quay cranes can transfer cargo directly from the ship to the balconies of these upper levels, and consequently should be used for all cargo moving into these upper levels. The upper levels of the warehouses should not be used for cargo in short-term storage.

A-5.11 PORT STATISTICS

It is noted in this report that statistical information in a meaningful form is not readily available. For example, the ports do not maintain any cargo handling records on either ship productivity or hatch stevedore production by commodity. In addition, there are no summary analyses of the data that are collected. Good statistical information is needed to provide planning and management tools for indications of problem areas and assessing the effectiveness of port improvements. Accurate, timely reports to top management on actual working hours, causes of ship delays, production rates, and similar factors would provide the required information on which to base corrective action.

Examples of required information follow:

- occupancy rates for each group of berths (e.g., general cargo berths, bulk cargo berths, container berths, and roll on/roll off berths), monthly and annually,

- time spent by ship at berth when discharging or loading,

- waiting times of ships by type,

- ratio between working time, waiting time, and the total turnaround time of ships,

- average amount of cargo discharged/loaded by a ship at the port, monthly and annually,

- throughput per berth, monthly and annually,

- average throughput per ship day in port for each type of ship and each class of ship size,

- average throughput per worker hour,

- average throughput per gang per shift,

- tons of cargo discharged/loaded to/from lighters,

- tons of cargo loaded/unloaded to/from rail cars and to/from storage areas,

- tons of cargo delivered directly to/from rail cars,

- tons of cargo delivered directly to/from trucks,

- amount of goods in each type of storage,

- average time spent by cargo in port storage,

- number of passenger ships and passengers disembarked and embarked,

- number of trucks entering the port at each gate, by type,

- number of containers discharged/loaded by size and empty/loaded ratios,

- number of roll on/roll off vehicles and tonnages,

- number of LASH vessels and number of barges discharged/loaded, monthly and annually, and

- tons of in-transit cargo discharged/loaded and countries of destination/origin, monthly and annually.

Other purposes in collecting accurate information on a timely basis and in a systematic form are:

- to provide a basis for determining unit costs of port services and formulation of tariffs,

- to provide a basis for forecasting cargo and ship traffic flows,

- to provide adequate and accurate data for port planning,

- to assess the justification of any freight surcharges applied by shipping lines or conferences, and

- to compare the ports' activities with those of other ports.

In 1971 the United Nations Conference on Trade and Development published a manual titled Port Statistics, which discusses the selection, collection, and presentation of port information. This manual is available from the United Nations, Publication Sales Number E-72.11.D.1.

It is recommended that a review of the need for the present statistical information be made and the recommended additional information be included in the monthly reports.

A copy of the ports' statistical information with an analysis of its contents should be forwarded to the General Establishment for Major Projects, Office of Ports, Planning Department. This information will be important to the establishment of port

development priorities, such as a fully developed container berth, and indications of other possible revisions to the plans for the expansion of the ports.

A-5.12 BUNKERING FACILITIES

There are virtually no efficient bunkering facilities in either of Lattakia or Tartous Port.

The limited means of taking bunkers, which are presently employed, would certainly never be allowed in a modern port, if only by application of fire and safety regulations.

The problem becomes acute when vessels are required to wait for long periods at anchor. Allied to this problem is the concomitant requirement for fresh water.

The method of taking bunkers in both ports is by means of wheeled bulk oil vehicles, which are driven openly onto the exposed main quay or other wharf, where fuel oil is then pumped into the vessel's receiving manifold. There are no apparent safety precautions, and no extinguishers or readily available hoses were seen when an actual bunkering operation was observed. A considerable amount of fuel was spilled on the quay on disconnection.

In modern efficient ports, subterranean reservoirs or tanks are usually located at each working wharf. The tanks can be 1,000 tons or more capacity, and the bunkering operation is safe and clean. Alternatively, a storage tank may be situated nearby on high ground and the product gravitated to the bunkering point. A detailed feasibility study of installing such facilities should be undertaken for each port.

To compound bunkering difficulties in Lattakia, there is no self-propelled bunkering barge available, and in cases of extreme necessity, working vessels have to be stopped and taken to an anchorage, while the vessel urgently needing bunker is put alongside and the fuel vehicles brought up to deliver the fuel oil. This procedure is very time consuming and compounds the delay time of vessels.

In Tartous, exactly the same situation exists and bunkers are taken in the same manner. There are, however, two privately operated self-propelled bunkering barges of 40 tons and 30 tons, respectively, plying from Arwad, and a new larger barge under construction.

It is recommended that a new bunkering barge of 500 tons capacity be acquired for Lattakia. The estimated price is SP 1,014,000. The barge has not been included in the investment

program, because the Consultants believe that it should be operated under private franchise, as is done at Tartous.

The possible placement of two underground storage tanks of about 500 tons each should be studied for use in each port, with submersible pump and outlet bunkering points as described above made available at each individual berth on the main wharfs of both ports.

A-5.13 MANPOWER DEVELOPMENT PROGRAM

At present, a significant number of the Lattakia and Tartous Company's top middle management and supervisory personnel in both engineering and operations are relatively inexperienced and undertrained. In many cases, particularly in the older Port of Lattakia, competent staff is reaching retirement age, and there is apparently little advance planning for replacing them with well qualified personnel. In fact, it is likely that personnel with required skills are unavailable and will need to be recruited and trained.

There is also a notable difference in the capabilities of some of the operating personnel in each port. For this reason, it is recommended that quarterly meetings be arranged between the two ports for personnel in similar positions for the purpose of exchanging information on such aspects and operating procedures, equipment, cargo handling methods, statistical analysis, engineering, and maintenance and repair methods.

Training Abroad

Rapid and continuing changes in ship design, cargo handling methods, equipment, and administrative techniques in maritime transportation over the past twenty years have radically altered traditional methods of vessel and cargo handling operations. To cope with these continuing changes, many organizations involved in maritime affairs have been formed for the purpose of exchanging information, ideas, and methods employed to cope with change. In the United States, for example, there are six regional groups representing the four coastal areas, the Great Lakes, and Gulf of Mexico that meet quarterly. In addition, the American Association of Port Authorities (AAPA), representing Canada, the United States, Central and South America, and the islands of the Caribbean, schedules annual five-day meetings for this purpose. The International Association of Ports and Harbors (IAPH) acts in a similar manner on a worldwide scale. The Japanese are noted for their delegations sent to observe port operations, particularly to ports served by their own national flag vessels. This practice of meeting for the exchange of information and study of new techniques is

followed by most maritime nations and is widely accepted. Such meetings, or individual visits and exchanges, are generally well received and have over the years proved to be most beneficial to all concerned.

The Consultants in principle favor in-country training of port personnel in the ports themselves. However, top management of both ports should be more involved in the types of programs discussed above.

These should include:

- General Directors - An extensive study tour of several port authorities including at least one specializing in the handling of containerized ships. Review overall port management, problems, and methods.

- Directors of Operations - Same as above with emphasis on operational problems.

- Directors of Administration/Finance - Same as above with emphasis on the administrative aspects of these ports.

- Port Customs Manager - Review modern customs clearance methods.

These study tours can be arranged through the AAPA, IAPH, the British Transport Docks Board (BTDB), or for a container port, directly with the HHLA in Hamburg.

In addition to these tours, a more intensive short course could be set up at one of the ports to be visited. This would require advance preparation. The Consultants do not recommend such a program at present but have included the requirement for determining its feasibility and cost as part of the terms of reference of the proposed Technical Assistance Program.

Training at the Ports

Several factors discussed in this report emphasize the importance of long term and institutionalized port management and operations training programs at both Lattakia and Tartous ports. These factors are:

- The planned expansion of both ports and the continuing increase in newer ships with greater cargo capacities.

- The forecast increases in numbers of ships and in tonnage of port throughput.

- Changes in loading and unloading practices caused by more containerized ships, palletization, and new mechanized handling equipment.

- The reaching of retirement age of many of the experienced and competent older staff.

- The lack of training of the newer management, supervisory, and engineering staff, particularly at Lattakia.

- The increased manpower skills required to maintain efficient operations under these conditions of expansion.

- The need to develop a network of part-time training advisors in each line department who will continue to support a long term training effort. These training advisors would usually be supervisors or foremen or individuals who demonstrate high interest. They would usually participate directly in training courses in their departments.

- The need to have an adequate facility in which to hold training programs as well as proper instructional aids (audio-video if possible).

Schedule

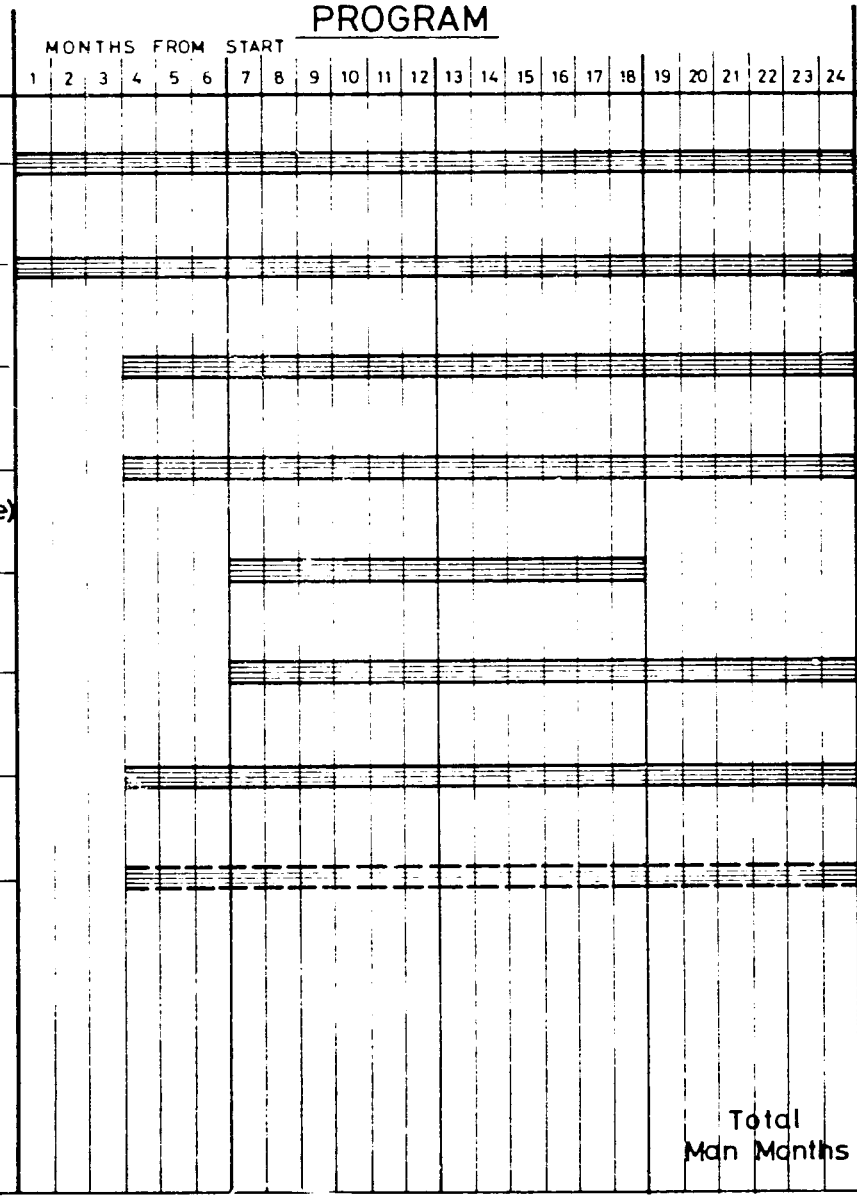
A tentative schedule for the advisory team is shown in Figure A-5.2. It is estimated that about 213 man months of advisory services will be required over a period of two years. The exact effect will require a more detailed analysis of existing personnel capabilities and the preparation of a detailed terms of reference.

Team Operations

The proposed advisory team should be recruited on the basis of its ability to solve real port problems, including major problem areas already identified by the Consultants. These areas should be assigned priorities on the basis of their impact on port throughput. It is most important that the team work with its counterparts in an integrated way. Improvements in one problem area (e.g., cargo unloading rate) may just move the problem to another area (e.g., transit storage) unless the ports are viewed as a system composed of numerous interacting parts. Development of on-going training programs in these major problem areas will require that the training specialist and the project manager, along with their assigned counterparts, pay particular attention to this aspect of the work.

PROPOSED STAFFING SCHEDULE
LATTAKIA & TARTOUS PORTS TECHNICAL ASSISTANCE PROGRAM

N°	TITLE OF ADVISOR	TOTAL MAN MONTHS
1	Team Leader (Coordinator and Chief Planner)	24
2	Training Advisor and Manpower Planner	24
3	Port Operations Experts (2)* (Cargo Handling - Aboard Ship)	42
4	Port Operations Experts (2)* (Cargo Handling and Port Operations on Shore)	42
5	Administration Advisor (Claims Handling, Standards and Procedures Certification, Documentation.)	12
6	Financial / Accounting / Budgeting Advisor	18
7	Equipment Operations / Maintenance Specialist	21
8	Short – Term Specialists · Curriculum Development · Inventory Control · Security / Safety · Rules and Regulations, Standards · Management / Supervisory	30
	Total Man Months	213



* ONE EXPERT FULL TIME AT EACH PORT.

FIGURE A-5.2

It is expected that the proper team can handle both ports within the scheduled time period, provided that two well-qualified ship and shore cargo handling experts are assigned full time to each port. These operations are most critical and also differ between ports - with different types of handling and porterage equipment being involved as well as a different mix of incoming and outgoing ships.

This section describes an intensive and continuing training program recommended to increase and sustain productivity at the ports. Such training can be justified on a cost/benefit basis in that:

- Vessel turnaround time can be reduced by increased cargo handling efficiency.

- Cargo losses and damage through improper handling can be reduced.

- Man hours lost through injuries caused by unskilled workmen can be reduced.

- Equipment damage and subsequent down time can be reduced while maintenance practices can be made more efficient.

The basic problem that exists in setting up such a program is that neither Lattakia nor Tartous has the internal capability to conduct such intensive training. In Lattakia there is no formalized training department. In Tartous a Training Department exists in name only in the Planning Directorate. The department is not staffed, however, and does no training.

This in-house training capability must be developed in parallel with improved operations and administrative procedures if the two port companies expect to increase productivity and overall efficiency of operations.

Development of such capability requires several key actions:

- Activation and staffing of the Training Department at Tartous. (A proposed position description for a Training Director in each port has been supplied separately.)

- Designation of a new Training Department in the Planning Directorate at Lattakia, assignment of responsibilities, and staffing to meet those responsibilities.

- Development of a cadre of Syrian experts in modern management, administration, and operational practices of the ports.

- Review of all operational and administrative procedures and development of plans for improvement - including customs procedures and cost accounting.

- Development of appropriate training programs around these new procedures.

- Institutionalization of the training process at the ports to sustain the increased productivity attained through the tutoring on-the-job training, and formalized training. This means that the Training Departments at both ports must be given the responsibility and necessary budget to sustain long term operations.

Proposed Technical Assistance Program

Because the Lattakia and Tartous Port Companies do not have the internal capability to establish their own training programs, they have investigated the feasibility of establishing a port training school under a new Maritime Academy. While such a school might be a useful supplement, it would not substitute for a strong, internal, job-related training program in each port. There is considerable experience which demonstrates the effectiveness of this type of practical training.

The Consultants therefore believe that the best solution is the use of a technical assistance team. This team, consisting of port experts and a training advisor, would work with and tutor assigned counterparts in all aspects of port management, administration, and operational methods and procedures over a long term. The Consultants further believe that such on-the-job training is fundamental to upgrading port operations. The following section describes the functions and requirements of the proposed technical assistance team.

It is recommended that a small team of expatriate port experts, including a training specialist (port experience desirable but not mandatory) be obtained through a technical assistance program to improve productivity of both ports.

Each expert would be assigned one or more counterparts, the number depending on the nature of the work. Where possible, counterparts would be the line managers or supervisors directly responsible for insuring that any new practices and procedures relevant to the work were in fact implemented.

In addition to a team leader and coordinator/planner, the following expertise should be obtained as an integral team:

- training and curriculum development,

- modern cargo handling ship and shore,

- security/safety and procedures - ship and shore,

- specialized cargo operations and stowage,

- administration (claims handling, standards and procedures, customs, clearance, certification),

- accounting and finance, and

- documentation, equipment operations and maintenance and parts control.

It is recommended that the chief planner and training advisor, scheduled to arrive first, prepare a detailed plan of actions as the first step, since the logistics of handling the two ports in parallel and the different problems of each must necessarily be taken into account. Following are suggested terms of reference and a preliminary schedule for this team.

Terms of Reference

The overall objectives of the proposed Technical Assistance Program are to work with assigned port personnel to improve and sustain port throughput and hence productivity. This will be accomplished by on-the-job tutoring and the development of appropriate training programs for the management, operational, administrative, and financial functions of the ports.

Specific Tasks

- Prepare a detailed plan of action covering work to be done at both ports. Identify common problems that could be solved jointly.

- Review and upgrade where feasible all key port operations/procedures - particularly those involving cargo handling.

- Review and upgrade administrative financial procedures with particular emphasis on cost accounting.

- Determine feasibility and requirements for automated data processing.

- Review and help develop organizational recommendations and prepare a handbook of general policy and procedures.

- Identify opportunities and procedures for obtaining in country training by representatives of manufacturers of port equipment.

- Review customs clearance procedures and recommend improvements.

- Review and upgrade management and decision making functions.

- Work with key personnel (managers, supervisors) in each of the above areas to tutor them on new or improved procedures/ techniques.

- Recommend study tours or short courses abroad, including manufacturers' factory training, when believed necessary to supplement in-country training.

- Work with the directors of the training departments to develop training courses in areas identified as critical to productivity or safety.

- Develop staffing requirements for the training departments based on the principle of keeping them as small as possible and using line personnel for specialized training.

- Insure that the work accomplished is institutionalized by developing necessary procedural handbooks and on-going training programs.

- Insure that an evaluation system is built into all training programs so that feedback from on-the-job performance of the trainees is received by the training directors.

- Conduct a manpower requirements analysis for both ports to identify present and future (to five years) skills shortages.

Expected Results of Program

It is expected that upon completion of this technical assistance program both Lattakia and Tartous ports will:

- Have a cadre of trained staff in each of the critical areas, both operational and administrative, that affect port throughput or productivity. This staff will have the capability to train others and to support the long-term training effort.

- Have formalized training departments functioning with qualified staff that can develop its own annual five-year plan and budget needs based on manpower analyses and identified critical areas requiring training.

- Have training programs and associated training aids developed for areas identified as most important to port productivity.

- Have the in-house capability to develop new training programs and their related instructional material based on continuing analyses of training needs.

- Have a built-in evaluation system to measure training effectiveness.

A-5.14 OTHER AREAS

Incentive Rewards for Improved Procedures

In every business operation, the personnel involved with the direct labor or supervision of work often have suggestions or ideas on how the work could be accomplished better and more efficiently. Sometimes these ideas are based on insufficient knowledge of the total operation and have little or no merit. However, the people directly involved are often more familiar with the day-to-day work. Given the incentive to think about improvements, many can and will suggest better procedures or improvements for a more efficient operation. The ports' administration should encourage employees at every level to write down their ideas and submit them to the management. Good ideas that can be applied and that will reduce damage to cargo, add to safety of the work force, and improve the cargo throughput should be evaluated and acted on. Rewards should be made for such suggestions in proportion to their estimated value. This proven concept is also valuable in creating a more productive and interested work force at all levels of labor and management.

Paper Work Reduction

The trend in world shipping is toward more paper work and reduced time to handle its processing. For this reason paper work must be simplified. This trend is evident for the following reasons:

- Faster ships and a greater frequency of sailing have reduced the need for importers to maintain a high cost inventory. This leads to smaller shipments on a more frequent basis. As a result, more shipping papers are produced annually without a corresponding increase in the amount of cargo handled.

- Newer, more expensive ships are designed to reduce non-profit time spent in port. Thus, more cargoes are unitized in order to reduce port cargo handling time. Ships that in previous years could spend a week in port to discharge now spend hours handling the equivalent discharge. Reduced port time means that the same or increased paper work for the vessel must be handled in a sharply reduced period of time.

- Newer ships, for the most part, are larger to provide more space for more shipments. Thus, the trend toward larger ships and increased cargo capability generates more shipping papers per ship. In addition, paper work requirements are stricter and create more work. Such items as better information for cargo control, security, insurance claims, port statistics, and increased government regulations all result in increased paper work.

In order to meet this demand for paper work processing, every effort should be made to eliminate unnecessary duplication and redundant information. Hand writing of ledgers, inventories, accounts, duplicate forms, and so forth can no longer be accommodated in the increasing amounts of paper processing. It is recommended that a thorough study of port paperwork be made for the purpose of simplifying current excessive records and record-keeping, much of which is of little value given the future aim of introducing a basic computerized system.

As the intricacies of a basic computerized record system are overcome, the computer programming should be expanded to serve as a ready reference for national port policy decisions and statistical analysis and as a tool for future national port planning.

CHAPTER A - 6

PORT TRAFFIC AND CAPACITY

Chapter A-6

PORT TRAFFIC AND CAPACITY

A-6.1 INTRODUCTION

Present and foreseeable future vessel construction and operating costs are expected to escalate rapidly. Ship operators, in order to minimize costs, have placed increasing emphasis on reducing ship turnaround time by unitization of cargoes, higher ship speeds, and more economical use of labor through mechanization. Total ship costs are under constant review in order to reduce costs. Concern on the part of ship owners goes beyond vessel operations and extends to the vessel terminal operations, inland carriers, and documentation. This is evident in that many vessel owners are now operating their own terminals and trucking fleets. An example of this in Syria is the Merzario Company container terminal on the Lattakia road to Aleppo.

Such efforts by ship owners are also seen in the trend toward specialization of ships for either specific trade routes or cargoes. This has resulted in the development of LASH (lighters aboard ship), roll on/roll off, container, lumber carriers, and a wide range of specialized bulk carriers. The emphasis in general cargo vessel development has been on mechanical handling of unitized loads.

The total amount of cargo flowing through a port is influenced by many factors. The main influence on recent port design and productivity, and hence capacity, has been the trend in one form or another to unitized cargo.

The impact of unitized loading is already being felt by the Syrian ports. Containers as one form of unit load are an example of a technology that, because of present port design, is causing open storage space problems in the Port of Lattakia. (See Infrastructure and Operations, Chapter B-3, for details.)

Roll on/roll off vessels are another form of unitized shipment. The rapid development of this form of cargo handling has already made certain aspects of the ports' calculations for throughput capacity obsolete.

This section of the report will deal with port design, cargo handling trends, and throughput capacity in light of these trends.

A-6.2 THE TREND TOWARD UNITIZATION AND ITS EFFECT ON PORT CAPACITY AND THROUGHPUT

Introduction

Although the principle of consolidating small packages of cargo into larger units is not new, the application of unitization to marine transportation has lagged in ports and trade routes employing inexpensive labor; until recent years, a further impediment has been the increased ship space requirement it entails. However, with the steady increase in construction and operating costs of ships, it has become increasingly evident that savings in port time resulting from faster handling of unitized cargo can more than offset the cubic loss as well as the costs of pallets or similar means of unitization.

Although the maximum benefits of unitization of cargo result from door-to-door shipment, substantial savings can result from pier-to-door and even pier-to-pier movements. Palletizing of cargo is the most basic and elementary step in mechanized unit cargo handling. Recommendations for the Syrian ports to acquire a minimum amount of stevedore pallets are important as a means of increasing productivity.

Roll on/Roll off Vessels

The principle of the roll on/roll off ferry is not new; it has been used primarily on short routes where the building of bridges has been impractical. In recent years, however, the ferry concept has been applied to ocean-going vessels. These vessels, with their ability to berth at relatively simple terminal facilities and their rapid loading and unloading rates, were an answer to the then high importation of goods and inadequate ports in the Arabian Gulf. As the Gulf ports develop, the more economical container vessels are replacing the roll on/roll off ships.

Container Vessels

The small container vessel, with its capability of handling approximately 200 containers, as compared to a similar size roll on/roll off vessel, with approximately 60 trucks, provides a larger payload to the vessel owner. This increase in payload cargo generally is followed by reduced transport charges. The more efficient and economical container vessels, once employed on a trade route, tend to drive the less economical roll on/roll off vessels out of the market, except on short sea routes such as from Greece to Syria.

LASH Vessels

The LASH vessels are an example of specialized ships for a specific trade route. It is expected that of the limited number built, most will be converted to container vessels and that LASH vessels will not have a significant impact on Syrian ports.

These developments in the Syrian ports, with their corresponding reductions in freight charges, will not take place until the construction of container-handling berths has been completed and the ports are equipped with mobile cranes cabable of rapid container loading/unloading rates. These rates should average 25 units per hour per crane. Properly operated and equipped, a container berth has the capacity to handle 1 to 1.5 million tons per year. Many Syrian imports are finished goods highly suitable for containerization.

Considering the already rapid expansion in the use of containers in the ports and the potential for significant reductions in Syrian transportation costs, the development of such facilities should be given a high priority.

It can be expected that the rise in container movements will, over a period of time, tend to make some of the existing or planned port facilities obsolete or redundant. Former calculations on port throughput capacity will no longer be valid. The ability of the ports, through the early development of container berths to increase capacity, raises the important question of capital investment in planned port facilities that will not be required. This question and related present trends in cargo handling and ship design should be carefully and thoroughly reviewed before construction is committed.

A-6.3 OVERALL PORT DESIGN

Further examination of the general arrangement plans for both ports indicates that certain design aspects, in light of more recent cargo handling trends in Middle East shipping, should be re-examined. The development of container berths with provision for large upland open storage areas should be further studied as a first stage development instead of at a later stage. With containers acting as mobile storage units, the need for and capacity of planned transit sheds and warehouses should then be recalculated.

The design of the Port of Tartous indicates that more recent developments in cargo and ship trends have been taken into consideration and considerable flexibility in design can be accomplished. As previously noted, the design companies' resident

engineers and the Office of Major Projects are continuing to adapt and revise their planning for the port to changing conditions.

A-6.4 LATTAKIA PORT TRAFFIC

Commodities

Commodity imports through Lattakia Port fluctuated considerably during the 1970s, and no clear trend can be discerned. As can be seen from Table A-6.1, import throughput declined in 1977 and 1978 from the 1976 peak and then recovered sharply for a new high in 1979. (Half of the increased tonnage in 1979 occurred in cement and iron and metals, relatively easier commodities to unload.) Imports, as shown in Table A-6.2, also fluctuated and do not show a clear trend. They are however, much less significant than imports in terms of workload. During the first six months of 1980 imports and exports through Lattakia were 1.6 million and 207,000 tons respectively, or 76 percent of the total 1979 throughput. In the past, port workload has been divided evenly between the first and second halves of the year, and if this applied in 1980 total throughput would reach 3.5 million tons, an increase of 53 percent over the 1979 peak throughput. This is unlikely to happen: since the backlog of shipments has almost certainly been drawn down, but monthly throughput rates that have been achieved are very commendable.

Types of Ships at Lattakia

Table A-6.3 shows the number of ships unloaded and loaded at Lattakia and cargo carried, by type of ship, for 1978 and 1979. The table indicates an increase in roll on/roll off and container ships, although their proportion of total ships remained relatively unchanged. They have contributed to, but not explained, the increase in throughput in 1979. In the first six months of 1980, the number of ships handled at Lattakia was 1,133, a rate slightly higher than 1979.

Data for all ships arriving at the Port of Lattakia during 1978 and the first half of 1979 have been organized into a computer data base, as described in Chapter A-3. The next two tables are formed from that data base. They are based on data during the 12-month period beginning 1 June 1978 and ending 31 May 1979- the most recent 12-month period for which complete data were available.

Table A-6.4 presents the ship arrival patterns. As can be seen, the average number of ships arriving per day is six, with relatively equal occurrences of more or less ships per day.

Table A-6.1

IMPORTS INTO LATTAKIA PORT 1970 -1979

(000 tons)

Commodity	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Cement	20	40	5	2	101	123	269	126	214	301
Iron/Metals	259	180	81	151	359	249	382	283	177	320
Timber/Wood	110	88	96	95	144	61	81	110	71	63
Yarn/Cloth	18	20	27	32	25	30	31	29	36	41
Machinery/Tools	68	62	91	85	101	176	223	175	130	162
Foodstuffs	58	49	25	86	101	88	174	163	214	194
Cloth/Jute Bags	18	7	115	7	6	10	14	6	9	22
Lube Oil/Grease	27	28	6	26	27	66	36	37	27	21
Rice	40	31	147	56	93	59	59	38	43	20
Sugar	142	172	56	118	127	64	120	144	117	120
Grains/Feed Concentrate	402	382	124	69	214	227	153	314	144	140
Chemical Products	196	196	85	107	120	152	121	138	90	137
Other	119	124	272	154	198	218	257	233	233	461
TOTAL	1,475	1,379	1,132	988	1,618	1,523	1,920	1,797	1,504	2,002

Source: Lattakia Port Company.

Note: Totals may not add due to rounding.

Table A-6.2

EXPORTS FROM LATTAKIA PORT 1970 - 1979

(000 tons)

Commodity	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Barley	175	-	8	5	-	-	15	31	-	-
Wheat	-	-	214	94	-	-	-	-	-	*
Cotton	157	152	154	122	102	85	139	124	137	112
Wool	4	6	8	6	3	2	2	4	7	7
Lentils/Legumes	11	21	27	11	8	7	22	33	62	67
Cottonseed Cake/Meal	73	39	66	18	11	8	5	44	1	-
Tobacco	6	4	4	3	3	7	5	9	2	2
Nuts	3	3	3	5	1	2	2	2	2	2
Other	34	28	29	46	20	20	72	90	37	126
TOTAL	463	254	512	310	147	131	262	337	248	317

Source: Lattakia Port Company.

Note: Totals may not add due to rounding.

* Less than 500

Table A-6.3

TYPE OF VESSEL AND CARGO CARRIED - PORT OF LATTAKIA

(Cargo in thousands of tons)

Type of Vessel	1978 Number	Imports	Exports	Total	Percent Ships	Percent Cargo
Break-Bulk	1,579	1,232	156	1,388	78	79
Roll on/Roll off	252	130	51	181	12	10
Full Container	121	68	17	84	6	5
Combination Container/Break-Bulk	78	74	24	99	4	6
Total	2,030	1,504	248	1,752	100	100

	January - May 1979 Number	Imports	Exports	Total	Percent Ships	Percent Cargo
Break-Bulk	600	708	71	779	72	73
Roll on/Roll of	118	110	36	146	14	14
Full Container	73	52	14	66	9	7
Combination Container/Break-Bulk	42	56	14	71	5	6
Total	833	927	135	1,062	100	100

	1979 - Total Number	Imports	Exports	Total	Percent Ships
Break-Bulk	1,588	NA	NA	NA	74
Roll on/Roll off	299	"	"	"	14
Full Container	176	"	"	"	8
Combination Container/Break-Bulk	88	"	"	"	4
Total	2,151	2,002	317	2,319	100

Source: Port of Lattakia.
Notes: The roll on/roll off vessels also carry some per-palletized break-bulk cargo.
NA = Not Available.

Table A-6.4

PORT OF LATTAKIA: SHIP ARRIVAL PATTERNS

(1 June 1978 to 31 May 1979)

Ships per Day	Number of Days	Percentage of Days
0	1	.3
1	11	3.0
2	18	4.9
3	35	9.6
4	41	11.2
5	53	14.5
6	58	15.9
7	40	11.0
8	41	11.2
9	28	7.7
10	19	5.2
More than 10	20	5.5
Total	365	100.0

Table A-6.5

PORT OF LATTAKIA: SHIP ARRIVALS BY SIZE RANGES

(1 June 1978 to 31 May 1979)

Size Range (NRT)	Number of Ships	Average (NRT)	Average Cargo (Tons)
0 - 300	502	236	531
301 - 1000	543	658	701
1001 - 5000	816	2,369	1,537
5001 - 10000	195	5,632	1,754
10001 - 30000	4	16,376	4,542
All Ships	2,060	1,734	1,098

Total Imports: 1,965,419

Total Exports: 329,159

Total NRT: 3,572,783

Source: Lattakia Port Company.

Table A-6.5, based on the same data, presents ship arrivals at Lattakia by size. The average ship entering Lattakia during the 12-month period was 1,734 net registered tons and had cargo to load/unload of 1,098 tons. The size range distribution showed a preponderance of smaller vessels. Almost one-quarter of the ships calling at Lattakia were less than 300 NRT; about one-half were less than 1,000 NRT; and a full nine-tenths were less than 5,000 NRT. This distribution is a direct result of the port's physical characteristics. The port is quite old and has many berths that are capable of handling only smaller vessels. As a result, importers have tended to use the smaller vessels. This can be expected to change when the port expansion is completed.

A-6.5 TARTOUS PORT TRAFFIC

Commodities

Commodity imports through Tartous Port tended to increase steadily from 1970 through 1977. After a slight dip to 2 million tons in 1978, they increased dramatically to 3.3 million tons (see Table A-6.6) in 1979. Three factors accounted for 95 percent of this sharp increase. They were:

- an increase of 516,000 tons of roll on/roll off cargo.
- an increase of 48,700 tons of containerized cargo, and
- an increase of 690,000 tons of cargo in the relatively more easily handled categories of cars, equipment, iron and steel, and cement.

Exports, excluding phosphate also rose sharply to 297,000 tons in 1979, compared with 36,000 in 1978 (see Table A-6.7). Not included in this figure are 300,000 tons of empty transit vehicles. The major part of the increase is accounted for by an increase of 145,000 tons of asphalt and 66,500 tons of empty containers. Phosphate shipments were also up 18 percent to 922,600 tons.

During the first six months of 1980 these trends continued. Imports totalled 2.4 million tons, an annual rate of nearly 5 million tons. Exports, excluding phosphate, totalled 270,000 tons, but the figure includes empty transit vehicles. A factor contributing to this increased throughput was the opening of pier B early in 1980, using ships' gear for unloading.

As a result, the waiting queue at Tartous was effectively eliminated. As in Lattakia, it is unlikely that the rate of the first six months can be sustained through the second six

Table A-6.6

IMPORTS INTO TARTOUS PORT, 1970 - 1979

(000 tons)

Commodity	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Cars	-	-	4	11	34	96	71	39	36	88
Equipment	3	4	76	78	153	208	280	270	251	555
Iron/Steel	63	55	64	68	126	205	327	470	235	458
Wood	45	31	26	71	83	79	47	192	129	209
Cement	44	91	24	1	80	169	406	293	467	578
Sugar	43	64	63	93	92	95	69	113	89	130
Foodstuffs	-	-	56	-	-	-	26	8	40	121
Chemical Products	-	-	28	17	53	39	51	117	123	250
Cereal/Feed Concentrate	198	340	227	50	77	108	99	301	232	384
Marble/Tile	-	-	-	-	-	-	19	23	32	56
Rice	-	23	5	-	2	11	23	49	59	47
Other	10	13	22	129	175	217	271	359	327	468
TOTAL	407	621	595	516	875	1,226	1,688	2,235	2,018	3,344
Transit Cargo	47	17	8	68	118	225	396	208	362	237
TOTAL	454	638	603	584	993	1,451	2,084	2,443	2,380	3,581

Source: Tartous Port Company.

Table A-6.7

EXPORTS FROM TARTOUS PORT, 1970 - 1979

(000 tons)

Commodity	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Cotton/Cloth	-	-	2.6	30.2	25.2	26.0	8.3	18.2	0.8	2.7
Wool	-	-	-	-	-	-	5.6	3.3	5.4	4.7
Leather	-	-	-	-	-	-	0.9	0.4	0.3	4.2
Asphalt	-	-	-	-	-	-	-	18.5	17.7	162.3
Cereals/By-Products	4.5	-	-	4.6	-	-	-	12.0	3.6	20.4
Livestock	1.5	-	0.3	1.5	-	0.1	-	-	-	-
Others	4.3	10.9	9.6	14.8	17.5	8.4	22.2	12.4	7.8	102.9[1]
Subtotal	10.3	10.9	12.5	51.1	42.7	34.5	37.0	64.8	35.6	297.2
Phosphate (Bulk)	-	-	60.6	227.7	286.4	201.4	318.8	523.2	780.0	922.6
TOTAL	10.3	10.9	73.1	278.8	329.1	235.9	355.8	588.0	815.6	1,219.8

Source: Tartous Port Company

1 Excludes empty transit vehicles.

months, since the backlog of shipments has almost certainly been drawn down.

Ships Calling at the Port

Table A-6.8 shows the number of ships unloaded at Tartous and the import cargo handled for 1978 and 1979. Several significant changes are shown in this table. The total number of ships and cargo are both up dramatically. Break-bulk cargo unloading increased 42 percent and the average cargo per ship increased 34 percent, due partly to an increased proportion of heavy bulk cargoes, as noted above. Despite this increase, the percentage share of break-bulk ships and cargo declined as roll on/roll off traffic jumped 267 percent in number of ships and 288 percent in cargo. As a result, roll on/roll off traffic increased from 9 percent of the total in 1978 to 21 percent in 1979. Containerized cargo also increased, but its relative share remained the same.

A-6.6 POTENTIAL CONTAINER TONNAGE 1979, 1985, and 2000

Both container and roll on/roll off traffic increased dramatically at the two ports in 1979. However, historical data are too limited to be of value in projecting trends for either category. The Consultants expect containerized cargo to grow more quickly in future years and to overtake roll on/roll off traffic, as the new port facilities improve the efficiency of container handling and the lower costs of container shipment, particularly from northern Europe, take effect.

A review of projected general cargo by commodity groups that are expected to move through the port in the years 1985 and 2000 was made to determine the potential magnitude of cargo that was suitable for containerization. An estimated percent was applied to each group to determine the portion that was likely to be containerized. Due to the small number of categories, and the wide range of commodities they embrace, the applied percentages were purposely kept low. The percentages and estimated tonnages are shown in Table A-6.9.

A review of the potential container cargo indicates that each port should have one full container terminal constructed by 1985 and at least one additional terminal by the year 2000.

The port administrations should maintain a continuing statistical review of container traffic. It cannot be expected, however, that large full container vessels with their inherent economies will begin to serve the ports until the ports are in a position to efficiently serve the ships.

Table A-6.8

TYPE OF VESSEL AND IMPORT CARGO - PORT OF TARTOUS

(Cargo in Thousands of Tons)

Type of Vessel	1978				
	Number Of Ships	Number of Trucks or Containers	Cargo	Percent Ships	Percent Cargo
Break-Bulk	1,389		1,804	86	89
Container	110	2,853	34	7	2
Roll on/Roll-off	112	6,077	179	7	9
Total	1,611		2,018	100	100

	1979				
	Number Of Ships	Number of Trucks or containers	Cargo	Percent Ships	Percent Cargo
Break-Bulk	1,479		2,566	74	77
Container	129	6,206	83	6	2
Roll-on/Roll off	411	22,390	695	20	21
Total	2,019		3,344	100	100

Source: Tartous Port Company reports.

Table A-6.9

POTENTIAL CONTAINER TONNAGE 1979 - 1985 - 2000

(000 tons)

Commodity Group	Percent Suitable	1979		1985		2000	
		Total	Container	Total	Container	Total	Container
Agriculture	45	258	116	247	111	1,204	542
Prepared Foodstuffs	80	741	593	897	718	1,889	1,511
Construction Materials	35	528	185	651	228	806	282
Manufactured Consumer Goods	65	1,316	855	1,602	1,041	1,881	1,223
Producers Goods	35	984	344	1,367	478	2,546	891
Animal Meat	50	26	13	65	33	320	160
TOTAL		3,853	2,106	4,829	2,609	8,646	4,609

Source: Consultants' estimates.

Under the plan for the expanded Port of Lattakia, initial construction of the bulkheads will begin in 1980. This work is expected to require at least 20 months. Following the bulkhead construction and land fill, construction will begin on the actual terminal facilities. During the initial period a further in-depth study should be made to determine the construction priority for a container terminal. The port planners and Office of Major Projects should discuss this subject with potential major vessel operators serving the port.

A-6.7 PROJECTED TRAFFIC

The Consultants' estimates of commodity production and consumption are presented in Chapter 4 of Volume II. Projected imports and exports have been derived as the residual amount by which production exceeds or falls short of consumption. These amounts have then been allocated by point of entry, based on the Consultants' origin and destination surveys and an analysis of customs statistics of all entry points for 1979. The resulting forecast of port traffic is shown in Table A-6.10 and presented graphically in Figure A-6.1.

The major change in 1985, shown in Table A-6.10, is the decline in imports. This is primarily the result of the Consultants' forecast of cement self-sufficiency by 1985. The resulting decrease in cement imports is partly offset by increases in other commodity imports, particularly consumers and producers goods. Transit traffic is potentially very volatile, depending on the political and economic situation in the countries of destination. The basis for the transit traffic forecast is presented in Chapter 5 of Volume II. The apparent decline in exports from Tartous is the result of unusually high asphalt exports in 1979.

A-6.8 PORT PRODUCTIVITY AS RELATED TO PORT CAPACITY

There are many factors that will influence present and future port productivity as it relates to actual and design capacity. They are as follows:

- port design and management,
- types of vessels to be served,
- cargo mix and amount of unitized cargoes,
- surface transport availability,
- port equipment,
- an adequate experienced labor force,
- customs procedures,
- water depth,
- bulk handling in lieu of bags and bagging,

Table A-6.10

PRESENT AND PROJECTED PORT COMMODITY TRAFFIC

(000 tons)

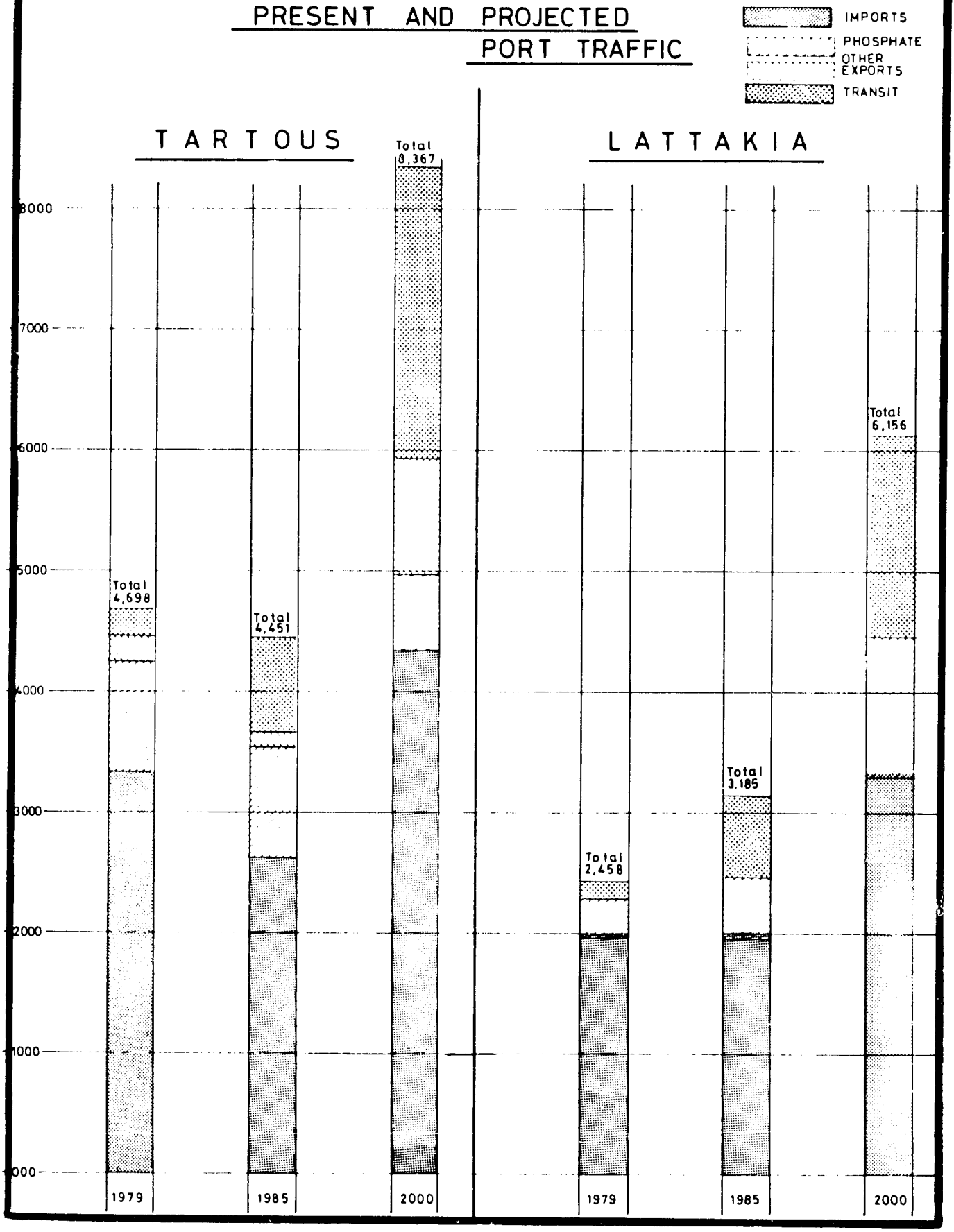
	1979	1985	2000
Imports			
Lattakia	2,002	2,010	3,346
Tartous	3,344	2,636	4,387
Total	5,346	4,646	7,733
Phosphate Exports	923	930	600
Other Exports			
Lattakia	317	505	1,110
Tartous	194	85	980
Total	511	590	2,090
Transit Traffic			
Lattakia	139	670	1,700
Tartous	237	800	2,400
Total	376	1,470	4,100
Total Traffic			
Lattakia	2,458	3,185	6,156
Tartous	4,698	4,451	8,367
Total	7,156	7,636	14,523

Source: Port reports and Consultants' estimates.

Note: Imports exclude wheat and barley.

FIGURE A-6.1

PRESENT AND PROJECTED PORT TRAFFIC



- good port planning through analysis of developing trends, and
- storage facilities and turnover rate.

The most recent general figures for berth capacity in tons per year as developed by the Port of New York/New Jersey Authority are as follows, based on one shift per day:

General Cargo	180,000 tons
Container	1 million tons
Multipurpose	350,000 tons

These are only general averages and relate to American conditions, but it is possible that comparable tonnages can eventually be achieved in the Syrian ports. In the interim, they can certainly be exceeded on a two-shift basis. The Consultants have used these annual average tonnage figures to calculate capacity after the first stage expansions of the Ports of Lattakia and Tartous are completed. It is expected that port capacity and cargo handling productivity will suffer through the construction and transition period.

This potential of the Syrian ports was demonstrated at Tartous in 1979. Pier A has a one shift capacity of 1.8 million tons of general cargo per year under the above formula. In 1979 the pier handled 2.6 million tons of general cargo, 695,000 tons of roll on/ roll off cargo, and 83,000 tons of containerized cargo. The general cargo above was 144 percent of the estimated one shift capacity.

The port capacity discussions that follow do not include the two grain terminals, which have a combined design capacity of 1,050,000 tons per year. With forecasted wheat imports of 320,000 tons in the year 2000, these facilities appear to be substantially overbuilt.

A-6.9 PORT CAPACITY

Plans for the expansion of Tartous and Lattakia Ports are discussed in detail in Sections C-3.7 and B-3.2 below. The Consultants' estimates of the general cargo capacity of the two ports, when present expansion is completed, are shown in Tables A-6.11 and A-6.12.

When expansion of Tartous is completed, the phosphate terminal will have a rated capacity of 6 million tons per year. The Consultants forecast of phosphate exports from Syria are 930,000 tons in 1985 and 600,000 tons in 2000 as expanding domestic fertilizer production overtakes expanded phosphate production. No exports of phosphate from Jordan through the Syrian ports are forecast through 2000.

Table A-6.11

TARTOUS PORT GENERAL CARGO CAPACITY

PER SHIFT - AFTER 1985

General Cargo	Tonnage
Pier A will contain:	
10 General Cargo Berths Capable of Handling 180,000 tons per Berth	1,800,000
Pier B will contain:	
5 General Cargo Berths	900,000
2 Roll on/Roll off	600,000
1 Container Berth	1,000,000
Subtotal	2,500,000
Pier C will contain:	
2 Container Berths	2,000,000
2 Roll on/Roll off	600,000
1 General Cargo Berth	360,000
Subtotal	2,960,000
Total General Cargo Capacity (Tons)	7,260,000

Source: Consultants' estimates.

Note: Lighterage is expected to be discontinued by 1985 and is not included in capacity. Total capacity does not include the grain terminal, which has design capacity of 400,000 tons.

Table A-6.12

LATTAKIA PORT GENERAL CARGO CAPACITY

PER SHIFT - AFTER 1985

Quay Berth Number	Commodities to be Handled	Estimated Capacity (tons)
2	General Cargo	180,000
3	General Cargo	180,000
4	General Cargo	180,000
5	General Cargo	180,000
6	General Cargo	180,000
(Converted from Passenger Quay)	General Cargo	180,000
7	General Cargo	180,000
8	General Cargo	180,000
9	General Cargo	180,000
10 and 11	Iron - Steel	450,000
12 and 12a	Lumber Terminal	300,000
13	Roll-on/Roll-off	300,000
14	Containers	1,000,000
15	Containers	1,000,000
16	Containers	1,000,000
Estimated General Cargo Capacity in Tons		5,670,000

Source: Consultants' estimates.

Notes: Lighterage should have been discontinued. The lighter quay area may be suitable for an expanded workshop area for floating equipment.

Due to a new rail line connecting the present port to the expanded port, east and north quays will be largely inoperable and are not included.

Total capacity does not include the grain terminal, which has a design capacity of 650,000 tons.

The Government has informed the Consultants that 500,000 tons of Iraqi phosphate will be exported through Syria through 1990, and up to 4.7 million tons per year will be exported from 1990 to 2000. Given the forecast worldwide surplus of phosphate rock, this volume appears to be optimistic, but even if it is achieved, the phosphate facility at Tartous will have the capacity to handle it.

The Government also expects 150,000 tons per year of Iraqi sulfur to be exported until 1983 and 200,000 tons per year to be exported from 1983 to 1990. The Consultants' projections indicate that, by 1985 Syria's sulfur production will be required for the manufacture of fertilizers and that net imports may be necessary in future years. Given the uncertainty of this traffic, a full feasibility study should be made before the projected 250,000 ton sulfur handling capacity is built at Tartous or as a separate facility.

A-6.10 PORT FACILITY REQUIREMENTS

The division of forecast general cargo between Tartous and Lattakia shown in Table A-6.10 is necessarily somewhat arbitrary. Given the fact that expansion of both ports is committed, they can generally be treated as interchangeable for purposes of balancing workload. Data for the two ports have been combined in Table A-6.13, which compares one shift capacity with forecast traffic in the year 2000. As the table indicates, in total traffic is only 1.1 times total capacity. However, this is sensitive to the share of container and roll on/roll off traffic. In Table A-6.13, Alternative A assumes that the full container potential shown in Table A-6.9 is reached by the year 2000 and that roll on/roll off traffic totals 2 million tons. The latter assumption is consonant with the Consultants' forecast that container traffic will grow at a faster rate, but it is reasonable in light of the forecast increase in transit traffic. Under Alternative A, break-bulk capacity is utilized at 1.4 times one shift capacity - about the rate that Tartous achieved in 1979.

In Alternative B the forecast shares of container and break-bulk capacity are reduced by 25 percent.

In Alternative C they are reduced by 50 percent. Even at these lower shares, the break-bulk facilities are only fully utilized on a two shift basis, with the potential for a third shift available.

From the above analysis, the Consultants conclude that, when Tartous and the Phase I expansion of Lattakia are completed, Syria will have adequate port capacity beyond the year 2000. However, as noted earlier, the Government should conduct a careful and continuing review of trends in containerization and roll on/roll off traffic.

Table A-6.13

PORT CAPACITY AND TRAFFIC - 2000

(000 tons)

	Container Terminals	Roll on/Roll off	Break-Bulk	Total
One Shift Capacity	6,000	1,500	5,430	12,930
Traffic Alternatives				
A - Tons	4,600	2,000	7,600	14,200
Percent Utilization	0.77	1.33	1.40	1.10
B - Tons	3,450	1,500	9,250	14,200
Percent Utilization			1.70	1.10
C - Tons	2,300	1,000	10,900	14,200
Percent Utilization	0.38	0.67	2.01	1.10

Source: Consultants' estimates.

B

PART B

LATTAKIA

CHAPTER B - 1

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Chapter B-1

SUMMARY OF FINDINGS AND RECOMMENDATIONS

B-1.1 SUMMARY OF FINDINGS

The major finding with regard to the Port of Lattakia is that, when the Phase I expansion is completed, and with achievable increases in productivity, the port will have sufficient capacity to handle its share of forecasted imports and exports and transit traffic beyond the year 2000. However, present and projected container trends indicate that construction of container berths should probably be accelerated. (Details are provided in Chapter B-3.)

At the completion of the physical survey of the Port of Lattakia, the Consultants concluded that the buildings, utilities, roads, rail, and quays were in reasonably good condition.

Port cargo handling equipment suffers certain deficiencies in maintenance and repair. These deficiencies are largely caused by inadequate repair facilities and a shortage of competent mechanics and other craft tradesmen. This problem is further aggravated by the lack of a systematic and procedural method for disposal and replacement of worn-out, unproductive machines. The procurement of spare parts for this equipment in many cases, is difficult because of its foreign origin and, often, because the model has been discontinued. Continued maintenance and repair to these uneconomic machines places an undue strain on the limited repair facilities.

From a design viewpoint, the port is beginning to suffer operational problems caused by the recent rapid changes in ship cargo handling requirements. These new requirements for open space container handling and storage with adequate room for maneuvering large trucks and handling equipment are rapidly making obsolete the need for permanent warehouses and transit shed buildings. The port is faced during this transitional period with the difficulty of having to handle combination vessels with mixed traditional break-bulk and container cargo.

Without the benefit of the conceptual study for the expanded port, and working only from the design layout plan, there are certain inherent environmental, recreational, and operational problems that should be reviewed again. Rail and road access to the expanded port, as presently located, appear to offer future congestion and restrictive operational problems that may be difficult to overcome.

The Port of Lattakia has suffered from low levels of cargo handling productivity and cargo throughput, along with annually increasing demands for its service. As a result, vessel delays, with their associated surcharges and demurrage costs, increased rapidly. However, increased productivity in late 1979 and early 1980 eliminated the ship waiting queue. For example, surcharges on liner vessels over and above normal shipping rates rose from 65 percent in July and August 1979 to 200 percent in November. The magnitude of these waiting time costs to Syria in foreign exchange is estimated at more than SP 7 million per month. (See Section A-3.3.)

One of the overriding problems facing the port is the unavailability of sufficient and coordinated land transport to move cargo rapidly from the port. At present over 50 percent of all general cargo is discharged from vessels directly to rail wagons or trucks. While this method of cargo handling is efficient, it is predicated on the ready availability of rail wagons or trucks to handle the daily volume generated by modern cargo handling methods and acceptable production rates.

Compounding the serious shortage of available trucks is the uncoordinated, poorly planned, and inefficient use of rail wagons serving the port. As a result, either ship turnaround at the berth is delayed or double handling is incurred in moving cargo through the transit sheds and warehouses.

Other findings of problem areas affecting productivity and throughput are:

- Although a considerable amount of cargo is arriving at the port unitized, there is a large potential for more unitization.

- Cargo handling without palletizing is causing considerable manhandling, lost time, and breakage.

- Ships arriving at the berth are, in many cases, not prepared to discharge.

- There is a high incidence of cargo-handling equipment out of service because of a lack of spare parts and inadequate repair facilities, and much of the equipment is worn out and should be replaced.

- Stevedore labor, gang size, and labor distribution throughout the port are inappropriately organized to meet present needs.

- Customs clearance procedures are overly long and have obvious deficiencies in staffing.

- Cargo handling in the warehouses by hand labor and hand trucks is slow and wastes storage capacity.

- Berths for large general cargo ships are now limited, requiring excessive lighterage and double handling.

- Container handling is difficult because of presently limited open storage space and handling equipment. (When the port acquires a mobile container crane with an automatic spreader lifting device, container handling from ship to quay should improve from an average of 4 per hour to a maximum of 25 per hour per crane.)

- Transit sheds are in disorder because of lack of transport, inefficient operational procedures, poor layout, and the use of the sheds for long-term storage.

- Lighterage of containers is hampered by poor lighter design.

- Truck parking on roadsides and inadequate control of traffic are causing bottlenecks and unnecessary delays.

- The lack of pallets, dock boards, and truck loading ramps is causing excessive hand labor and damage to cargo.

- There is a need for increased authority for management to purchase required equipment spare parts, thereby eliminating unnecessary delays in the workshops and equipment shortages.

- Inexperienced labor, the need for improved supervision, and lack of incentives contribute to low cargo handling productivity, equipment shortages, and maintenance costs.

- The use of transit sheds for long-term warehousing is contributing to ship congestion in addition to using warehousing capacity unnecessarily.

- Lighterage unloading delays caused by poor scheduling, supervision, lack of equipment, improper cargo handling, and use of lighters for short-term storage are creating a false lighter shortage.

Thus, the port suffers from a complex set of interacting operational, physical, supervisory, and administrative problems.

B-1.2 RECOMMENDATIONS

Palletization

The port should acquire 25,000 pallets as soon as possible for cargo movements from the ship through the transit shed to the truck loading dock.

Electric Wiring

In general, electric wiring, especially open connection boxes and conduits, is below acceptable wiring standards. This condition is particularly evident in the grain silos building. An electrical survey should be made of all buildings; corrective measures should then be taken.

General Port Cleaning

The port's cleaning equipment is limited and consequently most of the cleaning work is carried out by manual labor. A road sweeper, a new water tank truck, and a new front-end loader should be provided.

Fences, Gates, Port Security

The poor condition of fences, the lack of proper night illumination, insufficient means of communication, and inadequate coverage of the patrol areas hamper the port's security. Fencing should be repaired, top barbed wiring installed, and high-density lighting provided. In addition to these recommended improvements, the security force should be equipped with short-range walkie-talkie radios. Walking patrols of the port should be instituted with the guards carrying a punch clock for station and time records.

Gates

As cargo volume and the number of trucks serving the port increase, the South Gate (No. 9) should become the principal inbound gate and the Main Gate should be used for outbound traffic. The use of one-way gates will ease the present congestion and conflict of inbound and outbound trucks.

Roadways

In conjunction with the use of inbound and outbound gates, the road system within the port would be better served by one-way traffic where feasible.

As the need for open space container operations increases and warehouse space requirements decline, the following buildings should be demolished: 112, 113, 114, 103, 104, 8, 9, and 10. Roadways in these areas should then be enlarged and clearly marked and the turning radius enlarged. After demolition of Building 113, the area now occupied and the surrounding area should be used for the motor equipment pool.

The area now used for the motor equipment pool should be used for incoming truck parking after the pool's relocation. This arrangement will relieve the present road congestion caused by waiting trucks that park at the side of the port roads.

Quay Bulkheads

The timber fender system of the quay walls is, for the most part, completely deteriorated and should be repaired or renewed where required.

Observed deterioration of the steel bulkheads at the South Quay suggests that a complete survey of all bulkheads should be made and that cathodic protection should be installed on all steel bulkheads.

There appears to be considerable deterioration in the concrete piling at the Silos Quay. This matter should be further explored.

Port Dredging

Consideration should now be given to maintenance dredging along the berthing areas at all quays.

Warehouse and Transit Shed Cargo Capacity Enlargement

The continued use of hand trucks and manual stacking limit stacking heights to approximately 1.8 meters. Forklift trucks are available for stacking pallets to heights of 4.5 meters. Pallets should be acquired and all available cubic storage space should be used. This will greatly increase storage capacity.

Dangerous Cargo Warehouse

The dangerous cargo warehouse should be completely surveyed by the port engineering staff to correct the many dangerous deficiencies that now exist. All long-term stored materials, broken packaged goods, and leaking containers should be either immediately disposed of or salvaged.

The dangerous cargo warehouse should be heavily equipped with fire protection devices. Lighting and wiring connections must be improved, with switches, lights, and all electrical connections enclosed in sparkproof boxes. Hand fire extinguishers are either empty or broken and should be replaced. One freshwater fire line valve stem is broken off, and fire hoses are disconnected and sometimes without nozzles. These fire prevention devices should all be examined and tested.

Workers should be provided with basic safety equipment, such as protective goggles, rubber shoes, aprons, and gloves. Water hoses should be readily available so that workers can rinse off any dangerous cargo spillage on their skin.

Outside security fencing is poor; the main entrance gate needs to be repaired.

Aleppo Storage Yards

The Merzario Shipping Company uses a leased section of the Aleppo Storage Yard as its container terminal. This practice should be encouraged. If followed by similar companies with high-volume container shipments to the port, it would relieve the port of much of its present lack of open space.

Warehouse and Transit Shed Limitations

The practice of allowing customs to use available space in the warehouses and transit sheds for long-term storage should be discontinued. If customs is unable to devise a practical system for disposal of goods, warehouses should be leased from the port and operated by customs. Customs warehouses would best be located in buildings 109, 110, 111, and 107.

North Quay Transit Shed Buildings Numbers 8, 9, and 10

These buildings should be demolished in order to provide ample truck maneuvering and loading areas.

Warehouse Buildings 112, 113, 114

These buildings are underutilized and require considerable repairs. They should be removed and their operations transferred to the underutilized three-story warehouse known as the Free Zone Warehouse.

The space now occupied by Warehouse Buildings 114 and 112 and the surrounding open areas is ideally suited to be made into an open container handling yard. The area of Building 113 should be used for the relocated motor equipment pool.

Grain Terminal Silos

The foundation failure in one of the silo cells should be investigated and corrected before it leads to additional foundation failures and a major expense. The silo's basement walls are experiencing ground water seepage. With the passage of time, this is causing undue dampness in the electrical controls room with probable deterioration in the circuitry. The walls should be sealed and a dehumidifier installed.

The silos should be equipped with ventilation fans for the removal of dust. The dust problem could cause explosions.

The inspection doors in the silos should be regasketed. In their present condition, they allow toxic fumigation gas to permeate the premises, which causes a serious health problem for the workers.

The grain silos' export conveyor system should be converted immediately to handle import grain. The procedure for accomplishing this is contained in this report. This work can be performed by port engineering staff. Until the silos' conveyor system is reversed, trucks should be used for transferring grain shipments from ship to silo.

Ship and Lighter Repairs

The failure in the vessel slipway foundation should be corrected. The present inactivity of the slipway is creating a backlog of vessels awaiting repairs and inspection.

With the expansion of the port's facilities, additional floating equipment, such as towboats, will be required to serve the port's needs. While the need for lighters will decrease, it is expected that the use of lighters, though limited, will continue. This, in turn, will require a study of the expansion of ship repair facilities.

It is recommended that a study be made of the ship repair facilities and equipment, with the findings incorporated into the recommended study of the harbor workshop expansion. This study should examine the need for an additional slipway.

Electrical Generating Station

Proper ventilation is needed to remove diesel engine exhaust fumes, and adequate lighting should be installed in order to execute repairs.

Fire Department/Fire Prevention

Internal fire fighting equipment within the buildings is in a deplorable state. A complete survey of fire hydrants, fire extinguishers, fire hoses, valves, and nozzles is required. This hazardous condition should be given prompt attention and the equipment made operable.

The present inoperable and limited fire alarm system should be repaired and extended to cover the entire port.

The salt water fire-main system should be kept under constant pressure. Delays of from 5 to 10 minutes result before there is a sufficient build-up of water pressure to effectively fight a fire.

A port-wide fire prevention inspection should be made and the present deficiencies in the warehouses corrected. The Fire Chief should be made responsible for all equipment and fire prevention practices in the warehouses.

Two of the mobile sea suction fire pumps should be relocated to other areas of the port. One such area could be the North Quay, which is not served by the fire water main.

Spare parts for the existing inoperable fire equipment should be obtained immediately. The present equipment is expensive and could be maintained if required parts were available.

There is only one vehicle, a Land Rover, available to tow the 12 mobile pieces of fire equipment. The Fire Department should have at least one additional Land Rover-type vehicle equipped with a tow bar.

Harbor Workshops

The basic equipment and limited space for repairs for port mobile cargo handling equipment should be studied. This study should be made in conjunction with an evaluation of the condition of all units. It appears that many of the facilities are being used for repetitive repairs to old, worn-out equipment. This practice puts an unnecessary strain on the present facilities.

Mobile Equipment Usage

A procedure should be introduced for disposing of unnecessary, unproductive equipment.

In conjunction with the recommended study for improved repair facilities, a review of inventory and policy for ordering spare parts should be undertaken. Manufacturers' recommendations should be sought on spare parts when new equipment is ordered.

Mobile Crane and Forklift Repair Shop

This building requires drip pans for oil and work pits and hydraulic mobile lifting devices for under engine repairs.

Proper lighting must be installed, and simple work benches, vises, drills, grinders, and parts cleaning tanks should be acquired.

Battery Charging Room

This shop should be equipped with at least three additional battery charging machines.

Floating Equipment

Although the equipment is generally in good condition, older equipment is showing visible wear and tear. An examination and survey should be made to determine which units should be replaced.

Lighters

There is no shortage of lighters, although some of these should be replaced with more efficient units. This is particularly true for container-handling lighters. Used available lighters in good condition that would be more suitable for containers and pre-palletized cargo may be available at a modest price from expanding ports in the Arabian Gulf. The acquisition of better-designed lighters capable of handling containers would be helpful in expediting the discharge and loading operation.

Spare Parts Building

A lift device needs to be installed in this two-story building to ease the movement of heavy, bulky spare parts now located on the second floor.

Spare Parts Purchasing Problems

When possible, equipment purchases should be standardized by type. Instruction books or lists of parts and serial numbers should accompany new equipment.

Greater autonomy is needed in port management to arrange for the disposal of worn-out, unproductive equipment, the procurement of spare parts, and the purchase of new equipment. Although present procedures are generally accepted practice for the acquisition of major equipment purchases, they are time consuming for the purchase of necessary spare parts for repairs.

Mobile Cargo Handling Equipment Usage

A detailed study should be made of mobile equipment usage, part requirements, cost of repairs per unit, and productivity of the units. An orderly system should be developed for the disposal of uneconomic units and the replacement, when required, with new equipment. This study should include a program for periodic inspection and preventive maintenance programs.

Analysis of Plans for the Expanded Port

Before construction is begun on the expanded port, a further review should be made of the planning criteria. There are a number of potential problems in the present layout. Rail and road access, as now designed, are questionable from an operational viewpoint. Container requirements for space and container cranes for speed of operation should be examined for possible priority construction. If the present rate of container growth continues, more open space will be needed and the designed storage and transit sheds will not be required and should not be constructed. Berth lengths for general vessels will be undersized if the trend to larger, more economical vessels continues and smaller ships are scrapped. The estimated tonnage capacity of the expanded port appears to be underestimated. These figures and projected operational practices should be reviewed together.

For the purpose of plan modification, trends in vessel size, tonnage projections, new cargo handling equipment, and availability of surface transport for the expanded port should be placed under constant review during the construction period.

Given the apparent excess capacity in the year 2000 and current container trends, the schedule for construction of the Phase I expansion of Lattakia should be revised to provide one container berth by 1985 and a second in the mid-1990s. The possibility of delaying the construction of some of the additional general cargo berths until traffic flows indicate they are justified should also be examined.

Lighting

Building and outside illumination should be measured and adequate mercury vapor lighting installed. Security lighting along the port's fence line is particularly poor.

Ventilation

Building ventilation should be improved. Clogged vents should be cleared and high velocity, low-speed fans should be installed where required. The use of gasoline-engine forklift trucks in improperly ventilated buildings should be prohibited.

Lighterage

The practice of using lighters for short-term storage should be discontinued.

Full lighterage should be provided to each ship corresponding to the number of hatches being worked. When possible, lighterage and the loading/unloading operation should take place on both sides of the vessel.

Due to the double handling of cargoes required, lighterage represents a difficult and expensive handling problem. It should be phased out of port operations as soon as decreases in waiting time permit.

Road and Rail Transport

The timely availability of surface transport in sufficient numbers to meet the requirements of the port should be given top priority by all concerned agencies.

Better coordination is required between the port's operations management and railway management. This may best be accomplished by having the Syrian Railways appoint a port rail wagon coordinator to work full time with the Exploitation Department.

Statistical information on rail wagon movements should be available to port management. At this time there is no planning to determine rail capacity and its role in serving the port.

The Lattakia Railway Branch Manager should attend the port's Operating Department daily planning meeting and make every effort to coordinate the rail movement with ship loading and unloading operations.

Information of the number of trucks available should be in the hands of the port's Exploitation Department prior to the two daily planning meetings. Trucks must then be scheduled to coincide with the vessel cargo delivery rate.

The port should establish a rule that cargo will be moved to transit storage whenever a truck is not available to receive it.

In addition to the silo improvements recommended above, every effort should be made in the future to optimize grain movements inland by means of bulk trucks and rail wagons.

Finance

The incentive wage system authorized by Law No. 75 of 1 December 1979 should be implemented promptly. Recommended principles on which the system should be based are set forth in Section B-5.4 of Chapter B-5.

The port's Accounting Department should undertake the development of a full-fledged cost accounting system based on the concept followed in the analysis in Chapter B-4. Preferably, this should be done in collaboration with a cost accounting consultant who would supervise the system's design and implementation.

B-1.3 RECOMMENDED PHYSICAL IMPROVEMENT PROGRAM AND EQUIPMENT REQUIREMENTS

Physical Improvement Program

The recommended physical improvements program to port facilities contained in Chapter 3 are considered to be well within the performance capability of the port's Engineering and Maintenance staff. As a result, labor and supervision costs are assumed to be already budgeted.

Equipment and material costs are calculated in Syrian pounds at 1979 prices. The total estimated cost is SP 943,800.

Improvement Required	Recommendations
Improve outside lighting along 3,065 meter fence line open storage areas.	Installation of High-Intensity Discharge (HID) lamps and reflectors, mercury type, mounted on 8 meter towers. Average distance between towers 300 meters. These lamps have an average life rating in excess of 24,000 hours and require little maintenance. Average lamp cost SP 975; tower poles cost SP 390 each. Work can be performed by port maintenance staff. Total estimated cost: SP 15,600.
Two high velocity, low speed ventilation fans to be installed in each of 18 warehouses and transit sheds.	36 required. Fans consisting of propeller within a mounting ring, panel, or case. Fabricated from sheet metal and cast aluminum, each with protective coating. Direct belt drive type, wheel diameter 40 inches, motor 5 horsepower RPM 600, 1,500 CMF. Cost per unit SP 1,560. Work to be performed by port maintenance staff. Total estimated cost: SP 58,500.

Eight buildings to be demolished and area paved for cargo and container storage. Total area 15,500 sq. meters.	Demolition to be performed by port maintenance staff. Paving of area. Cost estimate: SP 487,500.
Walkie-talkie radio for security force, 22 required.	Central transmitter and receiver U.S. $800. 22 radios, SP 8,580. Total estimate: SP 11,700.
Install dehumidifier in Grain Silos Electric Control Room (space area 1,700 cu. ft.).	One unit 1 ton capacity including 15 meters of duct work. Unit to be a combination air conditioner and heating unit at SP 2,340. Duct work: SP 1,170. Installation by port maintenance staff. Total estimate: SP 3,510.
Install automatic fire alarm system in warehouses and transit sheds.	Use standard of performance established by U.S. Underwriters Laboratories and National Fire Protection Association NFPA 71 and NFPA 72 publications. Estimated cost SP 19,500 for each warehouse/transit shed, 18 units. Total estimate: SP 351,000.
Repair and replace wood fender system on quay bulkheads.	Estimated material cost purchased in local market, SP 15,600. Work to be performed by port maintenance staff. Total estimate: SP 15,600.
Study foundation failure in one grain silo cell.	Requires study of design plan, possibly new soil borings, in order to determine cause.
Change export grain conveyor to silos to import grain.	Details of recommended conversion of conveyor system are contained within this chapter. Work to be performed by ports maintenance staff. No investment cost required.

Estimated Equipment Requirements

Between 1980 and 1990 the port will undergo major physical and operational changes. It is expected that both ship design and cargo-handling technology will continue to advance. The trends to new technology are already evident. Continuing study of the present expansion plans over the construction period will reveal that certain modifications are required, and reductions in scope will possibly be called for.

Forecasting equipment requirements and their estimated costs in this time frame is extremely difficult. Any forecast of equipment requirements beyond the year 1990, at this time, would be misleading. In order to estimate equipment requirements for 1980, 1985, and 1990, the Consultants made the following assumptions:

- By 1985 port expansion will have been completed at berths 7, 8, and 9.

- By 1990, the first stage expansion plan, berths 7 through 16 will have been completed.

- Present East and North quays will be in limited use due to new rail lines crossing through the area in the period 1985-1986.

- Construction priorities will be placed on two full container berths, the first by 1985 and the second by 1990.

- Lighters will be phased out by 1985.

- Container and pre-unitized shipments will continue to increase at a rapid rate, reducing the need for port stevedore pallets, 3 to 5 ton fork trucks, and shore mobile cranes of 5 ton capacity.

- Roll on/roll off ships will increase their capacity over the next five years, followed by a gradual decline with the completion of the full container berths.

- The present inventory of equipment will be reduced to include only that which is considered operational.

- Allowance must be made for present and future equipment replacements as required.

Table B-1.1 gives estimated equipment requirements and costs for 1980, 1985, and 1990. These requirements should be carefully reviewed with each stage of development of the expanded port.

Table B-1.1

ESTIMATED EQUIPMENT REQUIREMENTS AND COSTS: PORT OF LATTAKIA

Equipment by Type	1980			1985			1990		
	No. on Hand	Add. Req'd	Cost (000 SP)	No. on Hand	Add. Req'd	Cost (000 SP)	No. on Hand	Add. Req'd	Cost (000 SP)
Mobile Cranes 4-5 ton capacity	26	4	312	30	14	1,092	36	12	936
Mobile Cranes 12-22 ton capacity	35	0	-	35	0	-	35	4	3,510
Mobile Cranes 75 ton capacity	1	0	-	1	0	-	1	0	-
Mobile Container Crane with Auto Spreader	0	2	2,730	2	0	-	2	4	2,730
Floating Henry Lift Crane 35 ton	1	0	-	1	0	-	1	0	-
Floating Henry Lift Crane 100 ton	1	0	-	1	0	-	1	0	-
Tow Trucks	5	1	58	5	0	-	5	2	117
Road Paving Roller	1	0	-	1	0	-	1	0	-
Yard Trailers for Container	0	10	585	10	5	292	15	15	878
Truck Tractors for Container Trailers	0	10	2,457	10	5	1,228	15	15	3,686
Industrial Farm Type Tractors	5	10	507	10	10	507	20	10	507

Table B-1.1 (Continued)

ESTIMATED EQUIPMENT REQUIREMENTS AND COSTS: PORT OF LATTAKIA

Equipment by Type	1980			1985			1990		
	No. on Hand	Add. Req'd	Cost (000 SP)	No. on Hand	Add. Req'd	Cost (000 SP)	No. on Hand	Add. Req'd	Cost (000 SP)
Yard Trailer 5 ton capacity	19	0	-	19	10	195	20	5	98
Wood Pallets 160 x 120 cm	0	25,000	1,950	23,000	2,000	156	20,000	0	-
Fork Truck 3-5 ton capacity	85	22	3,003	63	30	4,095	50	10	1,365
Container Fork Truck with Auto Spreader	2	1	1,365	3	2	2,730	5	2	2,730
Lighters	47	0	-	47	0	-	0	0	-
Lighter Replacement for Containers		4	1,170	4	0	-	0	0	-
Tow Boats 85-300 HP	12	0	-	12	0	-	10	0	-
Tug Boats 300-1100 HP	3	0	-	3	2	780	5	0	-
Pilot Boat	2	0	-	2	1	312	3	0	-
Street Sweeping Machine	0	1	332	1	1	332	2	0	-
Warehouse Sweeping Machine	0	2	39	2	1	20	3	0	-

Table B-1.1 (Continued)

ESTIMATED EQUIPMENT REQUIREMENTS AND COSTS: PORT OF LATTAKIA

Equipment by Type	1980			1985			1990		
	No. on Hand	Add. Req'd	Cost (000 SP)	No. on Hand	Add. Req'd	Cost (000 SP)	No. on Hand	Add. Req'd	Cost (000 SP)
Yard Mobile Equipment									
Service Truck	0		136	1	0	-	1	1	136
Yard Fuel Truck for Mobile Equipment	0	1	39	1	0	-	1	1	39
Total			14,684			11,739			16,732

Source: Consultants' recommendations.

CHAPTER B - 2

ORGANIZATION

Chapter B-2

ORGANIZATION

B-2.1 THE PRESENT ORGANIZATION STRUCTURE

The de facto organization as shown in Figure B-2-1 does not vary significantly from the de jure organization as specified in the Legislative Decree that established state control and set up guidelines for the organization of the Lattakia Port Company. The organization is structured under an eight member Board of Directors. With only an 8 percent private invested interest, there are no members representing the private stockholders on the Board.

The organization includes the General Director of the Port Company, who is President of the Board; the Deputy General Director, who is Vice President of the Board; the Director of Planning for the port company; two members appointed from the port workers cooperatives; the Chairman of the Shipping Agencies Company; the Director of Customs; and a representative of the municipality.

In contrast with many other Government-owned companies, this Board does provide a forum for outside interests, advice, and counsel. The boards of other companies, composed of majority membership representing management and minority representation from the labor cooperatives, are essentially management committees providing no input from outside sources that have interests in the operation of the companies.

Considering the functions and responsibilities of the Ministry of Transport, it would be appropriate that a representative of the Ministry be a member of the Board of Directors.

There has been no clear definition of the duties and responsibilities, or delegation of authority, for the position of Deputy General Director. He does not have direct line responsibilities over the managers of organizational units or for any of the company's activities. Under the de facto organization structure he is, in effect, an assistant to the General Director, who delegates duties to him; and in the absence of the General Director he assumes responsibility for the management of the operations.

The operations and functions of the company have been assigned to five major directorates; three independent departments; (Pilotage, Medical Center, and Port Security) and the General Director's office, called the Secretariat. The heads of these organizational units report directly to the General Director.

PRESENT ORGANIZATION - LATTAKIA PORT COMPANY

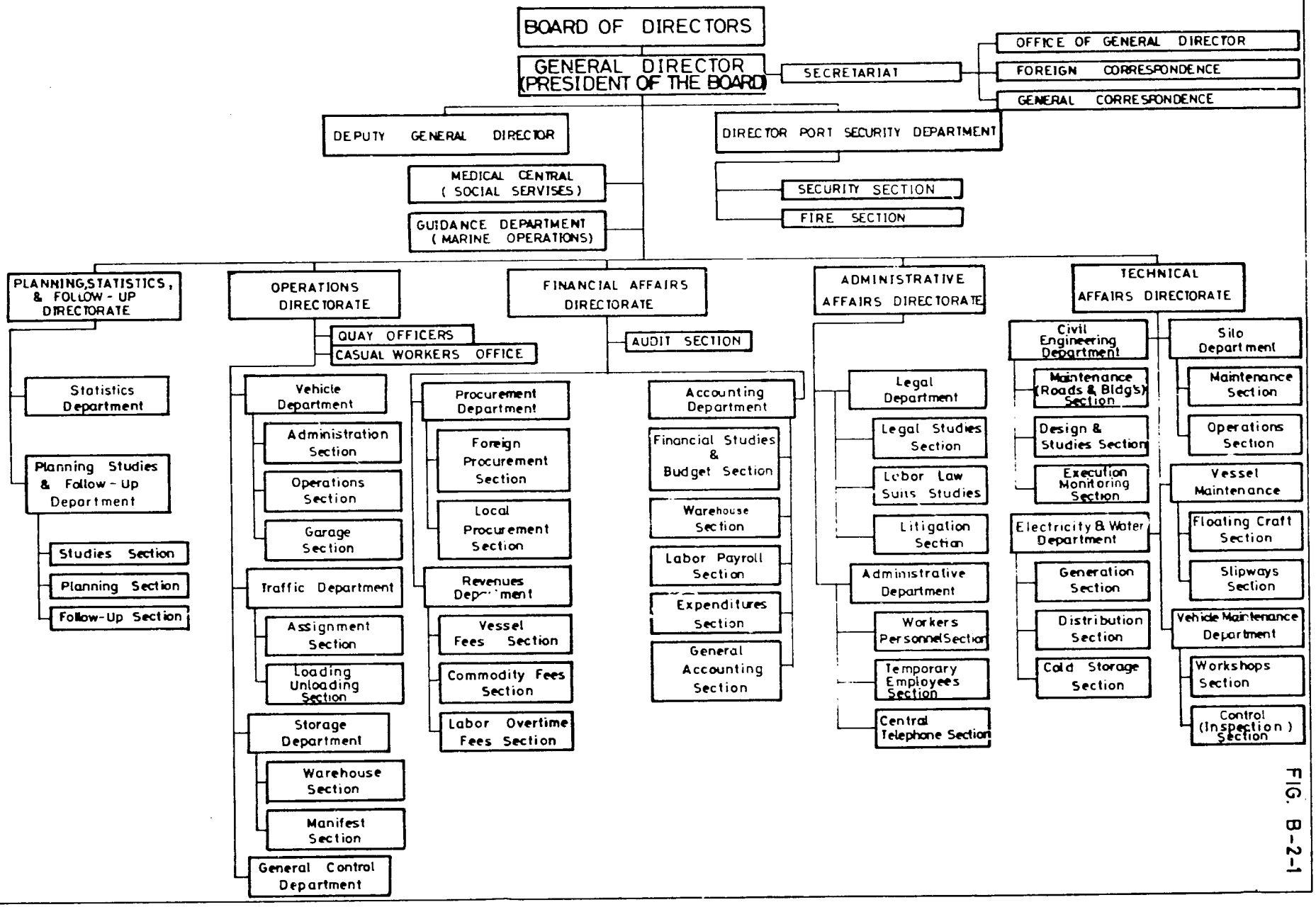


FIG. B-2-1

The Administrative Affairs Directorate and its Administrative Department are misnamed. The directorate consists of a Legal Department employing four lawyers with six support personnel, and a Personnel Unit consisting of fourteen employees engaged in personnel screening and record keeping, along with five telephone operators who work on the central telephone switchboard. Although these activities can be considered administrative affairs, they represent only a small percentage of what in an organization the size of Lattakia Port Company would be considered the responsibilities of an administrative affairs executive. Many of the functions that should be, and are normally considered, responsibilities of an Administrative Affairs Director are now assigned to the Secretariat Office, Medical Center Department, and the Financial Affairs Directorate. The decision to move the Medical Center along with the social services functions from under the directorate to report directly to the General Director only enhanced the disenfranchisement of the Administrative Affairs Directorate.

The Planning, Statistics, and Follow-up Directorate is delegated responsibility for all functions associated with compiling, maintaining, and analyzing all pertinent statistics; undertaking studies to improve productivity; developing training procedures and programs; planning long; medium; and short-range projects to improve operations, reduce costs, and improve profits; developing the annual schedule for the accomplishment of the State's general plan as established by the State Planning Commission; and following up on the execution, and evaluating the progress of, implementation of plans and projects. The Directorate, with a total personnel complement of nine employees, is unable to fulfill the potentially vital functions assigned to it.

The Statistics Department, one of two making up the Directorate, currently compiles production figures, traffic, and other pertinent data, assembles the data, and issues periodic reports. The Planning Studies and Follow-up Department undertakes some studies, where the exigency requires attention, and develops some corrective plans. The shortage of trained qualified personnel precludes the effective performance of the organization and negates the value that could be realized from the application of appropriate analytical techniques. Additionally there are no employees currently engaged in the development of training materials, procedures, and programs.

The Operations Directorate comprises the Vehicles, Traffic, Storage, and General Control Departments. It is responsible for the loading, unloading, transportation, and warehousing all cargo entering or leaving the port area. The Traffic Department develops daily work schedules and supervises the loading

and unloading of vessels. The Vehicles Department assigns vehicles and equipment in support of the work schedule, performs minor maintenance, and maintains equipment records. The Storage Department is responsible for warehousing all cargo, verifying ship manifests, and maintaining all records of movement of inventory in and out of storage.

The General Control Department under the direction of the Deputy Director is essentially non-existent as no employees are assigned to this activity. The functions of this department were to undertake studies and analyses of operations, methods, and procedures for the purpose of identifying areas where improvements could be made, to increase efficiency and productivity. The functions defined for this unit of the organization are needed and can, if properly staffed, make significant improvements in productivity, safety, and the profitability of the port. However, the functions properly should be assigned as part of the study responsibilities of the Planning, Statistics, and Follow-up Directorate.

Under the present assignment of functions, the Vehicles Department operates garage facilities for accomplishing minor maintenance and splits responsibility for assuring the operational condition of the vehicles and equipment with the Technical Affairs Directorate. Preferably all facilities for the maintenance of vehicles and equipment should be under the control of the Vehicle Maintenance Department within the Technical Affairs Directorate. The Operations Directorate should be responsible only for scheduling the use of and operating the equipment.

The Financial Affairs Directorate as currently established is adequately organized to accomplish the functions associated with receiving and controlling revenues; disbursing and controlling expenditures; maintaining the general ledger accounts; maintaining payroll records; and producing the payroll; and conducting financial audits. There are only two employees assigned to the Financial Studies and Budget Section in the Accounting Department. This is a serious shortcoming within the Directorate. There is a need for knowledgeable, competent personnel possessing financial expertise and analytical abilities to staff these activities. Another weakness that is apparent within the Directorate is the absence of cost accounting, as discussed in Chapter B-4 below.

Considering the volume of data and the accompanying records that are maintained in this Directorate and the data analysis and reports that are expected from the Planning, Statistics, and Follow-up Directorate, the port should study the possibility of acquiring a computer and establishing a Data Processing Center. It appears that the utilization of a computer

would reduce the volume of manual record keeping that is presently required and would enhance the analytical capabilities of the port.

The Technical Affairs Directorate is well organized. Its functions, duties, and responsibilities are clearly delineated and assigned to knowledgeable, experienced engineers and technical personnel. The Director is a qualified engineer with many years of experience in port operations, overseas and in Syria. Lack of depth in experienced trained personnel at the management level and skilled positions may in time become a problem if provisions are not made to acquire and train younger replacements for present personnel.

The Port Security Department includes the fire fighting function and is responsible for the security and protection of the port's properties. In addition, the organization undertakes investigations of crimes and other illegal acts that occur on the premises. Considering these duties and responsibilities, it is appropriate that the Director of Security report directly to the General Director.

The Guidance (Pilotage) Department, responsible for all maritime functions associated with the operations of the port, currently reports directly to the General Director. This activity should be closely affiliated with the stevedoring activities. Close coordination and communication need to be maintained. As a vital part of the direct line production functions of the port's operations, it would be preferable to place the responsibility for these functions under an operations manager who daily can coordinate, direct, and control the marine- and land-based shipping and receiving operations.

The Secretariat is the office of the General Director and as such does handle the executive administrative affairs of the General Director and the Board of Directors. In addition it contains two sub-departments, the Foreign Correspondence and General Correspondence departments. These departments assume many of the functions that should be assigned to the Administrative Affairs Directorate, including central mail, typing, copying and files. The extent of the office's activities is reflected in the fact that it employs about the same number of personnel as does the entire Administrative Affairs Directorate.

B-2.2 RECOMMENDATIONS FOR REORGANIZATION

To strengthen the organization at the upper level of management, it is recommended that three Deputy General Director

positions be established with clearly defined direct line responsibilities and delegated authority commensurate with the positions. The three Deputy General Directors should be members of the Board of Directors, replacing the present Deputy and the Director of Planning.

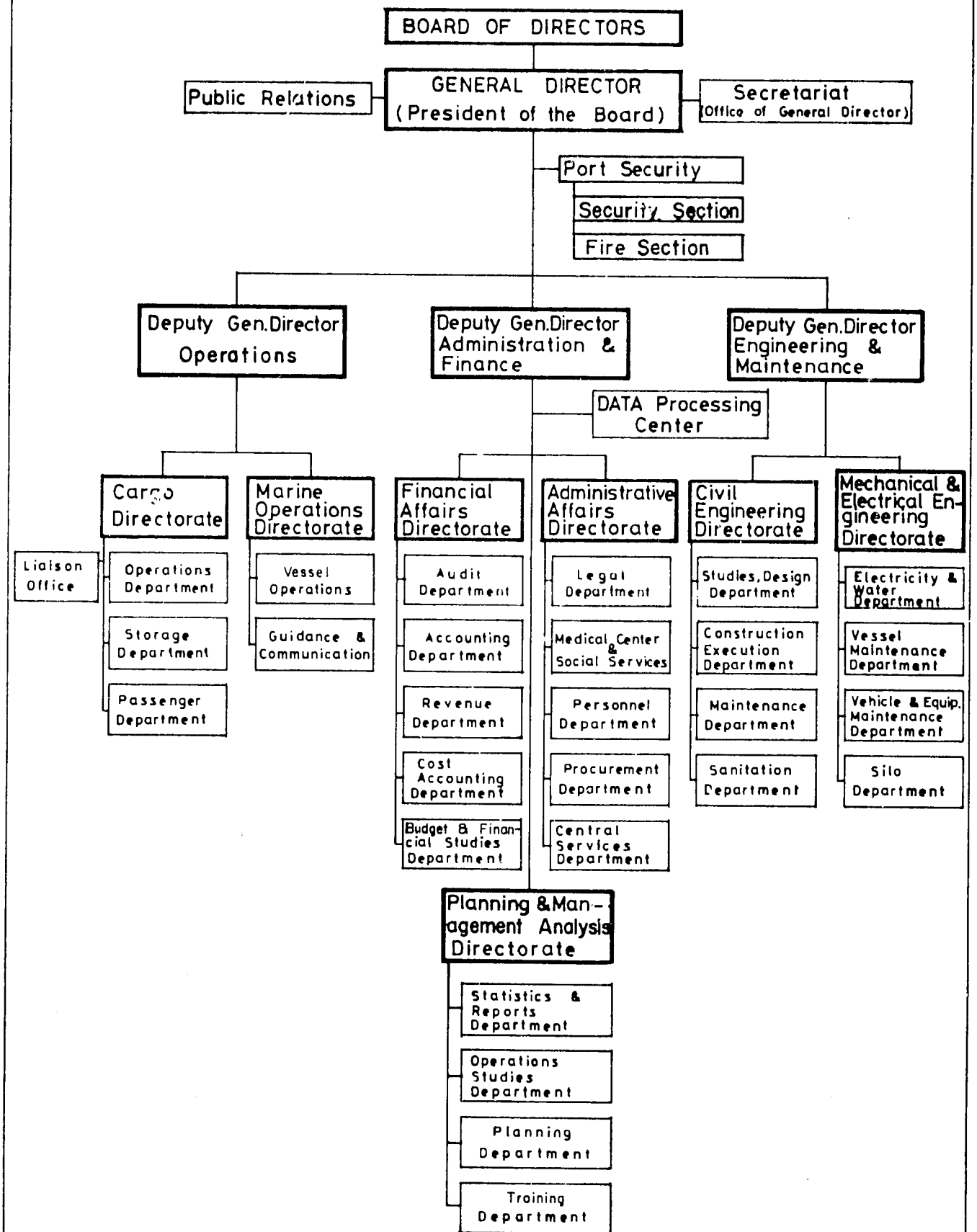
As shown in Figure B-2-2, the proposed organization separates direct cost functions from indirect cost functions, to the extent possible, and delegates responsibility accordingly. Management responsible for the revenue-producing activities inherently has an aversion to all indirect labor, non-revenue-producing activities and therefore should not be confronted with making decisions regarding such expenditures. If faced with the dilemma of how to allocate and spend funds, they will neglect maintenance, operations analysis, and other important overhead support activities in favor of production, the generation of revenues, and the realization of profit or compliance with budget. Decisions as to the allocation of funds between direct revenue-producing activities and the indirect support activities should be responsibility of the General Director under the guidance of the Board of Directors.

The Deputy General Director for Operations would be responsible for revenue-producing activities, or the direct labor functions of the company. These include: cargo, loading, unloading, storage and transport distribution, as well as the marine activities of pilotage, towage, berthing, lighterage, floating cranes, and provisions for ships awaiting berthing. These activities, comprising the Cargo and Marine Directorates, are the heart of the port operations, engaging the majority of employees and requiring close supervision, control, and daily coordination with shippers, agents, and rail and truck agencies.

Recognizing the importance of communicating and coordinating with the transportation companies and agencies that schedule and transport cargo consignments into and out of the port, the Consultants recommend that a Liaison Office be set up and that it report to the Director of the Cargo Directorate. The office, in support of the operations scheduling unit, would maintain a liaison with the railroad companies, the cargo transport offices, and independent trucking interests. The prime responsibility of this unit would be to assure that trucks and rail equipment will be made available and arrive in accordance with a time-phased schedule that is in consonance with the loading and unloading of ships. A well-coordinated effort should contribute significantly to alleviating port storage and traffic congestion and expedite throughput of cargo at the port.

FIGURE B-2-2

PROPOSED ORGANIZATION LATTAKIA PORT COMPANY



The Deputy General Director for Engineering and Maintenance would be responsible for the maintenance all of the entire port facilities and for the design and construction of any new facilities. Although the activities are non-revenue-producing/ overhead cost functions, they are vital for effective operations of the port and maximizing throughput of cargo. The area of the port, the extent of the facilities, the knowledge and skills required, the number of the people employed to accomplish the assigned tasks, and the costs involved justify the position in the management structure. Additionally, when considering the continuing growth in activity and the planned expansion of the port, it is preferable that top management give this important indirect labor support activity close attention. The restructuring of this organization, as recommended is similar to the existing organization. However, in recognition of the importance of sanitation, a department has been included that reports directly to the Director of the Civil Engineering Directorate, the organization responsible for the maintenance of buildings and grounds. Currently, the responsibility for the functions that would be included in this department, such as garbage collection, janitorial services, and window cleaning, are spread throughout the organization and have no point of control for scheduling and direction.

The Deputy General Director for Administration and Finance would be responsible for finance, administrative affairs, legal affairs, planning, operation analysis, and the possible Data Processing Center. As shown in Figure B-2-2, the organization is composed of three directorates and the Data Processing Center, which would be a service center, providing data processing services wherever they have effective utility, across the spectrum of the organization.

The administrative and financial functions would include, but not necessarily be limited to:

- maintaining financial, accounting, production, personnel, legal, and other pertinent required records,

- compiling of relevant data and issuing of financial, accounting, production, and other required management reports,

- analyzing operations with the objective of reducing costs, through increased utilization of equipment and facilities,

- planning improvements in the port's operations, systems, and procedures,

- planning for growth and expansion of the port's operations,

- screening and hiring personnel,

- providing medical services and social benefits for the employees,

- procuring supplies and equipment in support of the operations, and

- providing routine services in support of the daily operations of the company (i e., central mail, typing reproduction, telecommunications, and files).

Under the proposed organization the responsibility for all the indirect cost service functions associated with providing services to management and personnel have been assigned to appropriate departments within the Financial Affairs, Administrative Affairs, and Planning and Management Analysis directorates.

The Financial Affairs Directorate has been structured into five departments to enable it to effectively accomplish its prime functions of accounting, budgeting, and cost control. The Accounting Department will be responsible for maintaining the general ledger accounts, accounts payable, and the payroll and for producing the periodic and annual financial statements and reports. The Revenue Department will be responsible for billing the revenue collection. The Budget and Financial Studies Department will be responsible for compiling and issuing the annual operating cost and capital expense budgets. On a continuous basis, the unit will analyze the actual expenditures versus the budget plan to identify any significant variances.

A new Cost Accounting Department with labor, material, and equipment utilization sections is recommended to discharge the cost accounting functions not currently existing. The Audit Department will perform internal financial post audits of the company's books and records. It will also be responsible for overseeing the taking of periodic physical inventories of the warehouse to reconcile the stock and accounting records with the inventory. In addition, the Audit Department should be responsible for auditing the records of contractors who work for the port to verify payments made and to assure compliance with contracts.

The proposed Administrative Affairs Directorate includes five departments that have been assigned the responsibilities for providing legal, personnel, and other general services that are required in the functioning of the port. The Legal and Personnel departments and the Medical Center will be responsible for the same functions that they are currently assigned. The Procurement Department, currently assigned to the Director of

Financial Affairs, should be transferred to this Directorate. The activity has only a remote relationship to financial affairs in that commitments are made for purchasing supplies. Under appropriate budget and cost control procedures, commitments could not be made that were not within the budget allotment or that lacked proper authorization. The Consultants believe that it is not conducive to good management controls to have an activity that is committing company funds under the same manager who is responsible for verifying expenditures and controlling costs. The proposed Central Services Department would be responsible for the functions of central telecommunications, the storing and distribution of administrative supplies and equipment, and central mail, typing, copying, translation, and files.

The latter functions are currently undertaken by the Secretariat Office. The Secretariat Office should be involved only in the pertinent and personal business related affairs of the General Director and Board of Directors. To provide coordinated direction and continuity for all personnel policies and employment affairs, it is recommended that one Personnel Department be established under the supervision of a personnel administrator.

The proposed Planning and Management Analysis Directorate has been delegated the responsibility for:

- maintaining relevant statistical data and records on the activities of the company, analyzing these data, and issuing appropriate reports,

- compiling regulations, traffic and other data applied at other ports, analyzing them, and apprising management,

- initiating operation, work methods, system and procedure studies to identify potential areas where improvements can be instituted that will reduce costs and increase productivity,

- undertaking studies of the plant to identify areas where changes in the layout and/or the equipment needed can facilitate increased utilization of the facilities,

- maintaining current layouts of the plant and inventories of the vehicles and capital equipment,

- developing long-, medium-, and short-range financial and operation plans and submitting the plans to management, the Ministry of Transport, and other responsible agencies,

- preparing the annual schedule for executing the development plans issued by the State Planning Commission,

- establishing a safety program and maintaining vigilance over all aspects of safety at the port, and

- developing training courses, material, and procedures to be used in training employees at all levels of operation.

To effect these responsibilities, the appropriate functions have been assigned to four departments: the Statistics and Reports, Operations Studies, Planning, and Training Departments. Each of these departments needs to be staffed with trained, experienced personnel who can apply the techniques of their discipline.

As indicated in Chapter B-3, there are unsafe conditions and unsafe practices existing within the port. Safety is an important function within any industrial operation, and a continuous emphasis should be made to eliminate all safety hazards that may damage port facilities or injure personnel. The manhours and medical expenses saved will generally more than justify the costs incurred in setting up a safety inspection and educational program. It is recommended that, within the Operations Studies Department, personnel be assigned the responsibility of establishing a safety program.

B-2.3 ALTERNATIVE ORGANIZATION

An alternative to the Consultants' proposed organization would be to retain the present single Deputy General Director and create five directorates, that would report through him to the General Director. The five directorates would be:

- An Operations Directorate, subdivided into Cargo Operations and Marine Operations Departments.

- A Financial Affairs Directorate, as proposed.

- An Administrative Affairs Directorate, as proposed.

- A Planning and Management Analysis Directorate, as proposed.

- An Engineering and Maintenance Directorate, subdivided into Civil Engineering, and Mechanical and Electrical Engineering Departments.

This alternative would require the Deputy General Director to be in the line of command, making decisions for the General Director and thus reducing the amount of work that would go to him. It would have the advantage of elevating the directorates to a higher level in the organization and it would be less change from the present organization. The main disadvantages would be the increased amount and level of work going to the General Director and his Deputy and the fact that the five directorates listed above are relatively unbalanced in size and importance. Because of this, the Consultants favor the recommended organization with the three deputies, but it is not an absolutely clear choice. The difference between these alternatives is less important than the consolidation of functions within the directorates that is recommended above.

CHAPTER B - 3

INFRASTRUCTURE AND OPERATIONS

Chapter B-3

INFRASTRUCTURE AND OPERATIONS

B-3.1 INTRODUCTION

The Port of Lattakia has been affected by technological changes in transportation, as have all world ports. From the mid-1950s to the mid-1960s, new port construction was designed to meet the requirements of standard general cargo vessels. This was a time of rapidly expanding world trade. By the latter part of the 1960s, container vessels were appearing on high-density trade routes. These vessels were, for the most part, conversions from general cargo ships, retaining much of their original cargo handling equipment. They were generally referred to as combination ships and utilized standard general cargo berths.

The majority of companies handling containers were utilizing conventional ship and pier handling equipment, e.g., fork trucks and ship gear. It was only when a company expanded its service into larger-size containers that more sophisticated vessels and handling equipment were employed, such as special chasis, gantry cranes, and straddle carriers. Most new vessel construction in the 1960s, replacing World War II tonnage, provided wide or multiple hatch openings and lift gear for the handling of containers. These innovations were generally included in two or more cargo holds.

With the rapid and unforeseen spread of container use that actually occurred after 1965, even newly reconstructed ports and ships quickly became obsolete.

Thus, as in the case of many ports, Lattakia was designed and reconstructed in the period just prior to the rapid changes in marine transport technology that brought about new requirements for port design.

The existing and planned expanded port must meet the continuing cargo handling requirements of traditional general cargo vessels and the quite different requirements for combination and full container vessels. For example, with the exception of some small fully containerized vessels, such as the Mini Line, most vessels serving the present port are general cargo vessels with containers carried on deck or within the hatch, mixed with the usual loose cargo stowage. As a result, the increase in container usage diminishes the need for transit and warehouse buildings but increases the demand for open container storage space.

Because of the multiple requirements of Syrian imports and the accompanying, extensive worldwide trade, the use of larger full container vessels does not appear to be likely until after 1985.

B-3.2 ASSOCIATED PORT TRUCKING PROBLEMS

In the 1950s and 1960s, when new transit sheds and warehouses were designed, the length of road vehicles had stabilized to generally meet European road conditions. In most cases, the length of vehicles by law did not exceed 30 feet. Truck and body were generally one unit. With the development of express highways, the lengths of trucks and semi-trailer trucks and the amount of traffic increased. The 40 foot International Container Length Standard adopted in the late 1960s was largely based on two principles: first, it fit a modular standard for containers of 10, 20, 30, and 40 feet; second, 40 feet was the maximum size that was acceptable on European highways. In a very brief period of time, highway engineers and truckers, taking advantage of the economics of size, were permitted to increase the allowable length of vehicles, and the combined length of truck and trailer was legally set at 18 meters.

The development of increased truck and trailer length created worldwide problems for many older cities and ports with restricted roadways. For example, the plans for port warehouses and transit sheds prior to the mid-1960s provided truck docks for direct tailgate loading with space between the dock and intersecting roadway of roughly 11 meters. Present-day trucks that serve these buildings now protrude onto the roadway and restrict traffic.

As a result of these changes in ships and land transport, many ports are now forced to adopt two types of cargo handling systems with very divergent requirements. This is particularly true of Lattakia, where the impact of rising imports and containerization is causing physical and operational problems. The port is making every effort to cope with the problem of inadequate open space for containers, new handling requirements, inadequate ship berthing facilities, a lack of required water depth at most berths, a shortage of surface transportation vehicles, and a shortage in the labor force in both numbers and experience.

B-3.3 DESCRIPTION OF THE EXISTING PORT

General

The Port of Lattakia is located on the northern coast of Syria, at Latitude 35°31' North and Longitude 35°46' East. It consists

of an inner and outer harbor protected by an extensive breakwater. The seaward boundary of the port is about two miles west of the breakwater, starting with the entrance line of 133° South (see Figure B-3.1).

The entrance channel, of approximately 50 meters width, 13 meters depth, and a turning basin of 400 meters diameter, is expected to be adequate for the present time and beyond 1985. The only restricted area is opposite the entrance harbor light. In this area the narrow channel width limits larger vessels to one-way traffic. Table B-3.1 gives specifications for the port's quays, including condition and use.

Physical Condition

A complete inspection and survey of the port's facilities was made by the Consultants. It included warehouses, transit sheds, roadways, an electrical generating station, a pump station, rail tracks, silos, refrigerated storage, mobile cargo handling equipment, quay walls, floating equipment, a passenger terminal, quay revolving cranes, fences, gates, and repair shops. Based on this review, the overall physical condition of the port is generally considered good. The Departments for Civil, Electrical, Refrigeration, and Mechanical Engineering appear to be competent.

Port maintenance in certain areas is hindered by inadequate repair facilities and equipment, lack of spare parts, and a need for training and retaining qualified personnel.

There are certain general, non-critical deficiencies in the 22 transit and warehouse buildings. Improvements are needed in lighting, ventilation, electric wiring, and fire prevention.

In general, the condition of the building floors, walls, ceilings, doors, and physical capacity to handle cargo are more than adequate to last to the year 2000.

The transit sheds and warehouses are well constructed. Column spacing is adequate, ceiling heights are more than adequate, and the walls, floors, and roofs are maintained in good condition. There is no evidence of floors or walls cracking or spalling. Doors are generally of a steel roller type and operable. The number of doors and their openings are suitable for truck and pallet operations. The newer buildings are equipped with security lockers. With the exception of some older buildings, the buildings have adequate wash rooms, offices, scales, and changing rooms for the employees.

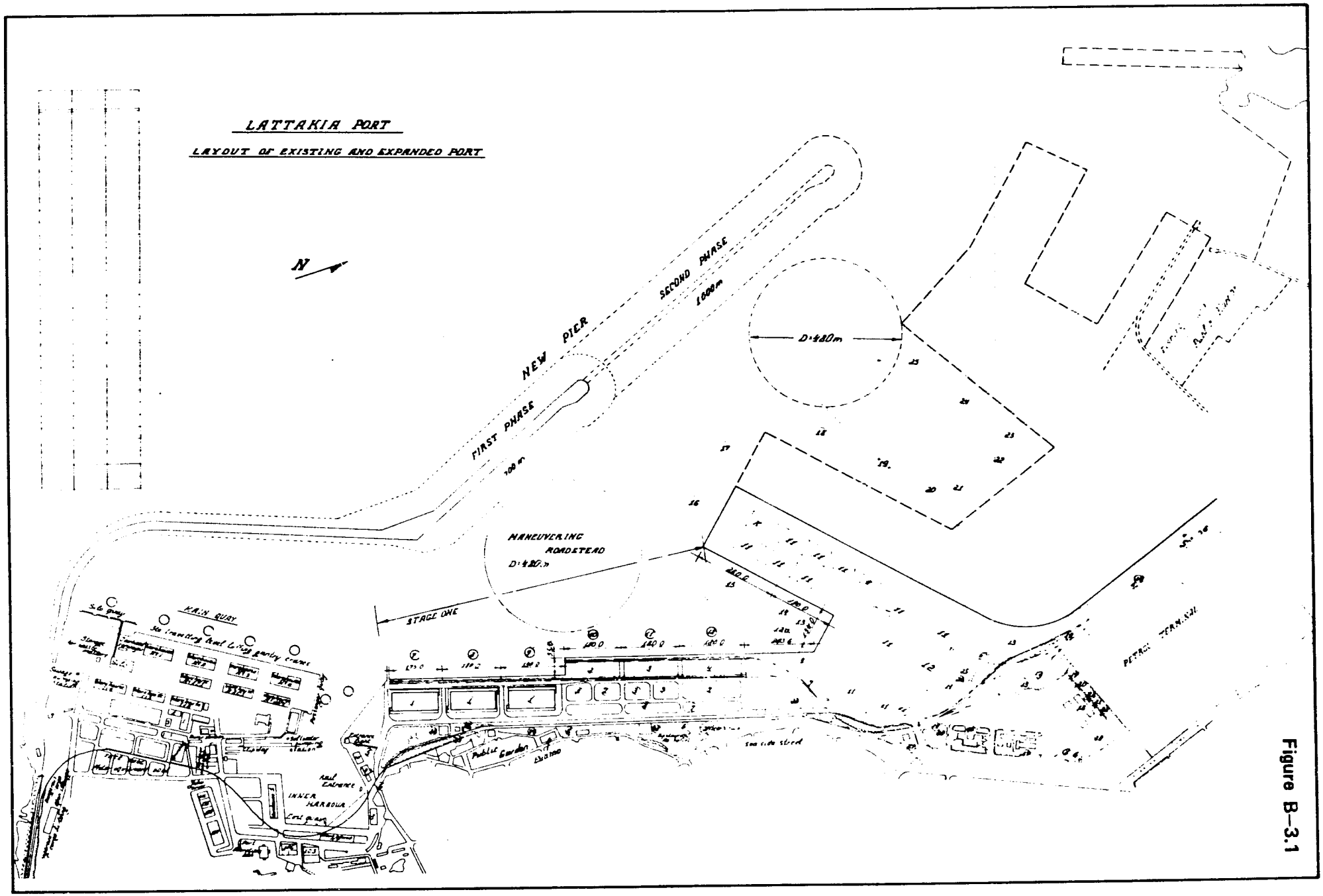

LATTAKIA PORT
LAYOUT OF EXISTING AND EXPANDED PORT
N
NEW PIER
SECOND PHASE
1000m
FIRST PHASE
700m
D=480m
MANEUVERING
ROADSTEAD
D=420m
STAGE ONE
MAIN QUAY
INNER
HARBOUR
Public Garden
PETROL TERMINAL

Figure B–3.1

Table B-3.1

INVENTORY OF EXISTING FACILITIES: PORT OF LATTAKIA QUAYS

Item	Main Quay	Passenger Quay	Slipway Quay
Structure Type and Size	Length 625 meters 4 berths including grain berth of 180 m steel piling with concrete deck; grain berth reinforced concrete	Length 75 meters Under reconstruction; steel bulkhead with steel reinforced concrete deck	Length 200 meters 80 meters in width; steel bulkhead concrete deck with 900 ton capacity slipway
Used For	Grain imports, exports and general cargo	Passenger ships, roll on/roll off, lighters, naval vessels	Naval vessels; repairs to harbor lighters and tow boats
Years of Construction	1950-1959	1950-1958	Reconstructed 1950-1958
Present Condition	Good	Good Under reconstruction	Fair Needs some repairs to apron and fender system
Estimated Remaining Life	40 years	40 years	20 years
Depth of Water at Quay	9.2 meters	8 meters	Approx. 4 meters
Maximum Ship Size	45,000 DWT	25,000 DWT	Approx. 1000 DWT

Table B-3.1 (Continued)

INVENTORY OF EXISTING FACILITIES: PORT OF LATTAKIA QUAYS

Item	Northern Quay	Southern Quay	East Quay
Structure Type and Size	Length 280 meters Steel sheet piling with stone apron paved with asphalt	Length 162 meters Steel sheet piling with concrete deck	Length 260 meters Steel piling with concrete decking
Used For	Small coastal vessels, lighters, general cargo	Lighters	Medium-size general cargo vessels, lighters, coastal ships
Year of Construction	Unknown; repaired 1950-1958	Reconstructed 1950-1958	Reconstructed 1950-1958
Present Condition	Fair	Fair Requires minor sheet piling repairs	Good
Estimated Remaining Life	10 years	20 years	30 years
Depth of Water at Quay	4 meters	Approx. 2 meters	5.2 meters
Maximum Ship Size	3000 DWT	Lighters 150 ton capacity	6000 DWT

Sources: Port records and Consultants' inspection.

Lighting

At the time the buildings were constructed, fluorescent lighting was the preferred type; it is used extensively in both the buildings and outside areas. Although light-meter tests were not conducted, the present lighting system is deemed inadequate for efficient identification of cargo marking; reading of tally sheets, warehouse receipts, and delivery orders; and security and safety.

Ventilation - Forklift Truck Fumes

Forklift trucks, although infrequently used inside the warehouse, are of the gasoline-engine type. They should, when confined to closed spaces, be powered by either electric motor or bottled gas. The present use of trucks creates a severe problem of fumes that results in a hazardous health condition. Many of the buildings' ventilators are clogged or not operating. They should all be inspected and put into proper operating condition.

Fire Prevention

Although there is an adequate fire department within the port, fire prevention conditions and equipment within the warehouses are poor. Hand fire extinguishers are, for the most part, empty. They are located in clusters, often obstructed by either doors or stored cargo. Fire hoses are not attached to fire valves, nor in most cases are fire nozzles attached to the hoses. In a number of instances, the fire valve stem is broken or the valve handle is missing.

Electric Wiring

A large number of conduit connecting boxes with open or missing covers were observed during the inspection of facilities. Wiring connections in the boxes were not of an acceptable standard. This is particularly evident in the grain silos.

Port Cleaning

The cleaning section employs 30 people, most of whom are retired from the port and now work to supplement their pensions. In addition to these 30, each warehouse has one person assigned to cleaning duties.

Under the section manager's direction, all warehouses, office buildings, quays, and open yards are kept clean. Observation of the port's sanitary condition indicates that this section does a very satisfactory job. It is also responsible for the control of rodents.

Equipment used for cleaning is limited, and most of it is past its economic life. There is one automobile, one water tank truck, and one converted front-end loader. Most of the cleaning work is performed by manual labor.

Fences, Gates, and Port Security

Although the vehicle gates and main gates are well manned and a careful inspection is made of vehicle contents and drivers, the security of the port is less than satisfactory.

There are 30 people employed under the direction of the military to ensure security. Their work is hampered by the poor condition of the fences, the lack of proper night illumination, insufficient means of communication, and inadequate coverage of patrol areas.

The present fences surrounding the port are of two types. The first is constructed of concrete blocks and the second, a cyclone type, is constructed of heavy-gauge steel. Both types are seven feet in height and are provided with steel brackets at the top for the attachment of barbed wire. The wire has not been installed. In some areas the wire mesh fence has been cut and in others it appears to have been knocked down by automobiles. With the limited fence height and its broken areas, it would not be difficult for an unauthorized person to gain access to the port. The fencing should be repaired and the top barbed wiring installed. The lack of adequate high-density lighting along the fence line adds to the security problem.

Main Quay Cranes

There are 12 electric rail-mounted cranes of 3 ton capacity located on the Main Quay. These cranes were installed in 1958 and have been in daily use since that time. It was observed that all units were in operating condition and appear to be properly maintained. The present cranes, although in good operational condition, have a slower line speed and hook time between ship and shore than many newer conventional general cargo ships. In some cases, shore cranes are being used when more efficient ship cargo handling gear should be employed.

B-3.4 QUAY BULKHEADS

Utilizing a port tow boat, the Consultants conducted a visual and hammer test of all the port's bulkheads. The general condition is good, with the exception of certain older areas where deterioration has occurred in the steel sheet piling and spalling has occurred in the concrete. In all areas except the passenger quay, considerable repairs to the timber fender system are required (see Table B-3.1).

B-3.5 PORT DREDGING REQUIREMENTS

The port is fortunate in not experiencing siltation to any appreciable degree. Dredging of channels and berthing areas can be held to a minimum.

Siltation has now reduced the berth design depths by approximately 70 centimeters.

The Main Quay design berth depth is 9.50 meters, but the quay is now reduced to approximately 8.80 meters. Review of vessel sizes and random checking of drafts for vessels entering the port indicates that few are arriving at a draft beyond 8.2 meters. Allowing for roughly 0.6 meters of water under a ship's keel for bottom clearance, the water depth at the Main Quay is at a minimum.

B-3.6 ROADWAYS AND GATES

The present arrangement of roadways and gates follows a logical layout for distribution of road traffic. The physical condition of the roads and gates is good, and most roads are adequately paved. In and out gates are properly manned and truck dispatch is not unnecessarily delayed by paperwork.

The length of trucks has increased and tractor-trailer lengths of 18 meters now predominate. Because of the increase in length, the turning radius for these vehicles has increased. This increase in length has also caused a restriction on tailgate loading (because of blockage) on the loading docks. As the number of trucks serving the port increases, these road problems will become more pronounced.

Gates

Truck movements to and from the port are predominantly handled at the Main Gate. In order to avoid difficult traffic problems within the center of the city, trucks leaving the port turn left and use what might be called the back road, which encircles the city and leads to the main exit highways.

The South Gate, No. 9, which would provide a more direct route to the back road, is underutilized at this time.

The third gate, for taxis, small vehicles, and personnel, is located on the north side of the port adjacent to the Container Terminal, Warehouse Building 205. Because of its direct connection to the city streets, this gate is not used for truck traffic. Two additional gates on the north side are now permanently closed to vehicle traffic for the same reason.

Roadways

One-way road traffic patterns should be established to eliminate many of the present difficulties resulting from cross-purpose patterns and to speed the movement of vehicles to and from their destinations.

As the need for open space container operations increases and warehouse space requirements decline, Buildings 112, 113, 114, 103, 104, 106, 8, 9, and 10, under the Consultants' recommendations, would be demolished and the areas paved. Roadways in these areas should be widened and clearly marked and the turning radius enlarged.

With the recommended removal of Warehouse Buildings 112, 113, and 114, the space now occupied by Building 113 and the surrounding open area should be used for the Motor Equipment Pool.

The area now occupied by the Motor Equipment Pool should be utilized as an incoming truck parking area. Trucks will be dispatched from this site to their assigned port loading area as required. This arrangement will relieve the present problem of trucks parking on the port's road sides while awaiting orders. It will also provide a more orderly dispatch of trucks to the quay.

There will still be restricted truck movement in certain areas, such as between transit sheds and warehouses on the Main Quay. However, the flow of truck traffic within the port will be greatly expedited with the above recommendations implemented.

B-3.7 ESTIMATED WAREHOUSE AND TRANSIT SHED CARGO CAPACITY

For planning purposes, it is estimated that the general cargo handled in the Port of Lattakia is averaging approximately 1.9 cubic meters to the ton.

Calculation of total storage space indicates that there are 96,000 square meters of space available in the 26 transit sheds and warehouses (see Table B-3.2).

For storage purposes, this space is reduced by 50 percent. The remaining 50 percent is occupied by aisles, loading areas, offices, and space between stacks. Under the present handling methods of hand trucks and hand stacking, the average height of each cargo stack is less than 1.8 meters.

One-half of total building area is 48,000 square meters, and:

48,000 square meters x 1.8 meter stack = 86,400 cubic meters
1.9 cubic meters 86,400 ÷ = 45,477 measurement tons

Table B-3.2

WAREHOUSE AND TRANSIT SHED SIZE

Warehouse Number	Size in Meters	Size in Square Meters
1	90 X 40	3,600
2	90 X 40 X 3	10,800
3	90 X 40 X 3	10,800
4	90 X 40	3,600
202	95 X 32 X 3	9,120
203	95 X 32 X 3	9,120
204	81 X 31	2,511
112	100 X 36	3,600
113	100 X 36	3,600
114	100 X 36	3,600
107	80 X 30	2,400
109	30 X 30	900
110	20 X 30	600
111	30 X 30	900
5	110 X 25	2,750
Free Zone	95 X 33 X 3	9,459
103	50 X 25	1,250
104	50 X 25	1,250
106	50 X 36	1,800
7	108 X 28	3,024
8	50 X 20	1,000
9	30 X 18	540
10	30 X 18	540
101	48 X 48 and 10 X 22	2,084
Container Buildings	102 X 45	4,590
Cold Storage	25 X 25 X 4	2,500
Total Square Meters		95,938

If pallet and forklift trucks were employed in the storage building, pallets could be stacked three high to a total height of about 4.5 meters. Allowing for short stacks and broken lots, the average height would be about 3.7 meters. It is readily seen that the present handling methods are reducing storage capacity by 50 percent.

A second limitation on warehouse space is the practice of allowing long-term storage and the holding of goods in storage by customs.

Contrary to the opinion expressed by port management that storage space is now limited, it would be, if it were properly utilized, rather in over supply. Most upland warehouses are using less than one-half of the available space, aisles excluded.

B-3.8 WAREHOUSE AND TRANSIT SHEDS

The preceding discussion dealt with the general condition of the port's buildings. Table B-3.3 gives specific information on each building.

North Quay Transit Sheds Buildings Numbers 8, 9, and 10 and Warehouse Building 101

The position of the North Quay bulkhead in relation to the location of the transit sheds provides an apron width of less than eight meters.

Due to the low depth of water at the quay, ship berthing is confined to small coastal vessels, with cement the principal commodity handled.

The current practice of handling cement directly from ship to truck by the mobile shore cranes works very well when trucks are available. However, the practice of utilizing space-taking shore mobile cranes and direct loading trucks limits the space for this operation. These sheds should be demolished in order to provide ample truck maneuvering and loading areas. Again, if trucks were readily available to move quickly into loading position, the production at this operation could be improved by an estimated 50 percent.

Warehouse Building 101 and the adjoining open space, if properly utilized, could accommodate all warehouse and transit shed requirements for this berthing area. In addition, this building could be used for the offices formerly located in the other buildings.

Table B-3.3

INVENTORY OF EXISTING FACILITIES: PORT OF LATTAKIA

WAREHOUSES AND TRANSIT SHEDS

Facility	Location	Area (sq.m)	Construction	Present Condition	Estimated Remaining Life (years)
106	Upland East Quay	1,800	1 story concrete	Serviceable to be removed	2
7[3]	East Quay	3,024	1 story concrete	Good	30
8	North Quay	1,000	1 story concrete wood timbers	Serviceable	5
9[3]	North Quay	540	Concrete Steel Frame	Serviceable	5
10	North Quay	540	Concrete Steel Frame	Serviceable	5
101	Upland North Quay	2,084	Concrete	Good	10
205 Container Building	Next to North Vehicle Gate	4,590	1 story concrete	Good	40
Cold Storage	Upland East Quay	2,500	5 story concrete	Good	30
204	Main Quay	2,511	Concrete	Good	30
112	Upland Main Quay	3,600	Concrete	Serviceable[2]	5[1]
112	Upland Main Quay	3,600	Concrete	Serviceable[2]	5[1]
114	Upland Main Quay	3,600	Concrete	Serviceable[2]	5[1]

Table B-3.3 (Continued)

INVENTORY OF EXISTING FACILITIES: PORT OF LATTAKIA

WAREHOUSES AND TRANSIT SHEDS

Facility	Location	Area (sq.m)	Construction	Present Condition	Estimated Remaining Life (years)
107	South of Main Gate	2,400	Concrete	Serviceable	-
109	South of Main Gate	900	Concrete	Serviceable[2]	5
110	South of Main Gate	600	Concrete	Serviceable[2]	5
111	South of Main Gate	900	Concrete	Serviceable	5
5[3]	South Quay	2,750	Concrete	Good	30
Free Zone Building	South Yard	9,459	3 story with elevators	Good	30
103	Upland East Quay	1,250	Concrete	Serviceable to be removed	2
104	Upland East Quay	1,250	Concrete	Serviceable to be removed	2
Dangerous Cargo Warehouse	Adjacent to Main Gate	2,000	Concrete	Serviceable[2]	5
1[3]	Main Quay	3,600	Concrete	Good	30
2[3]	Main Quay	10,800	3 story concrete with elevators	Good	30

Table B-3.3 (Continued)

INVENTORY OF EXISTING FACILITIES: PORT OF LATTAKIA

WAREHOUSES AND TRANSIT SHEDS

Facility	Location	Area (sq.m)	Construction	Present Condition	Estimated Remaining Life (years)
3[3]	Main Quay	10,800	3 story concrete with elevators	Good	30
4[3]	Main Quay	3,600	Concrete	Good	30
202	Main Quay	9,120	3 story concrete with elevators	Good	30
203	Main Quay	9,120	3 story concrete with elevators	Good	30

Sources: Port records and Consultants' inspection.

1 Should be demolished.

2 Needs repairs.

3 Transit shed.

Warehouse Buildings 103, 104, and 106

It is understood that these old warehouses are scheduled for demolition in the near future. The sloping ground area they now occupy will be graded, paved, and used as an additional container storage area. When Warehouse 106 is removed, the roadway should be realigned to provide direct large truck tailgate loading at the old storage warehouse.

Warehouse Buildings 112, 113, and 114

Originally these warehouses were open-sided sheds used for grain storage. After the silos were constructed, they were converted to general cargo warehouses. They are under-utilized and require considerable repairs. There are numerous wall cracks and roof openings at the expansion joints. When it rains, the below-grade floor leaks a great deal.

In addition to these problems, no provision has been made for a warehouse office or toilet facilities. The lighting in these buildings is very poor, and there are no provisions for ventilation. Because the buildings are used infrequently, they are kept closed and locked at most times. The corrugated steel roof absorbs the heat, resulting in an oven effect on the buildings' contents. The buildings should be removed.

Dangerous Cargo Warehouse Building

This warehouse, measuring approximately 2,000 square meters, is located on a slight ground rise south of, and adjacent to, truck gate 9.

This warehouse is one of the few exceptions to the generally high level of upkeep in the port's buildings, yet it should receive the most attention in terms of security and maintenance. In its present condition and operation, it is unsuitable for housing dangerous cargoes. A number of upper windows and vent screens are broken, thus allowing rain to leak into the building.

Fortunately, the warehouse is only about one-half occupied with goods. Most of the goods stored here have been in storage for a long time - some shipments for up to 10 years. Many of the container drums and packagings are deteriorated and broken and are leaking.

One lot of paint and chemicals, marked flammable, is open and damaged. It is located adjacent to a shipment of cooking oil that contains a number of leaking cans.

Aleppo Storage Yards

The port has acquired two parcels of land located about 10 kilometers outside of the port on the road to Aleppo. The total area is 150,000 square meters; the first parcel is 90,000 square meters, the second, 60,000 square meters.

The first yard has a separate fence-enclosed area of approximately 27,000 square meters for the storage of motor vehicles, mostly automobiles. The remaining area is used for the storage of such items as cement mixers, cable coils, large cement pipe conduits, and construction steel. The material stored here is awaiting customs clearance, which can take from two weeks to three months.

Merzario Yard

The second yard is leased for the most part to Merzario Company as a container terminal. The smaller section is used for the storage of steel drums, which presumably contain chemicals or hazardous material.

The Merzario container terminal serves as a depot for inbound empty containers and as a distribution yard for full containers. It is well equipped with container forklift trucks for loading in and outbound units. A major portion of these containers is employed in the in-transit trade, operating under TIR regulations. On a yearly basis the terminal handles approximately 1,500 inbound and 1,500 outbound units.

It appears that the Merzario Company uses this terminal exclusively for its bi-monthly vessel service. When its vessel arrives, the full containers are taken directly to the yard by truck trailers, which return to the ship with empty units.

The concept and use of this terminal relieves the port of a considerable open storage problem.

B-3.9 WAREHOUSE AND TRANSIT SHED LIMITATIONS

There are four basic operational problems in the buildings that, at present, are limiting their physical capability to handle goods at their full capacity. These problems - truck loading restrictions, goods held in warehouses by customs, handloading in and out of the warehouses, and waste of cubic storage capacity - will now be discussed.

Truck Loading Restrictions

It is important to note that the distance between the rear truck dock loading platform of Transit Shed Buildings Numbers

2, 3, and 4 and the front loading platforms of Warehouse Buildings 202, 203, and 204 provide a roadway width of only 20 meters. When rail cars can occupy the track at the rear of Buildings 2, 3, and 4, the roadway width is greatly reduced. As a result, the combination of rail cars and truck loading at these buildings impedes or in some cases blocks vehicle access to the roadway.

Goods Held in Warehouses by Customs

While there was not a complete survey of all goods held on a long-term basis in the warehouses and transit sheds by customs, a random sample indicates that considerable goods are held (see Table B-3.4). The practice of allowing customs to use the available space in these buildings for long-term storage should be stopped. This practice tends to limit warehouse capacity in the port. Customs should lease its own warehouse space from the port, away from the operational area. Such an area could be, for example, in Warehouse Buildings 109, 110, 111, and 107.

Lack of Mechanization in Warehouses and Loss of Cubic Capacity

Based on a random sample of forklift trucks available in the Motor Equipment Pool, there are enough trucks to handle all warehouse requirements. It makes little sense to purchase this type of expensive machine for handling cargo and then not to utilize its capacity because of lack of necessary pallets for volume handling. It was noted that some of the warehouses and transit sheds, notably Transit Shed Building No. 7, employed a forklift truck for volume pre-palletized loading, unloading, and warehousing.

The newer warehouses were equipped with electrical receptacles for powering mobile conveyors. It was intended that these conveyors be used for stacking cargo. The conveyors, however, were never purchased.

B-3.10 GRAIN TERMINAL SILOS

The Grain Terminal Silos and berthing dock with associated conveyors were built in 1958, with a storage capacity of 45,000 tons.

The machinery and associated equipment are in good operating condition. However, there are problems, such as exposed electrical wiring connections and men smoking in areas that should be restricted, that should be promptly corrected in order to avoid possible dust explosions or health problems to the workers.

Table B-3.4

RANDOM EXAMPLES OF GOODS HELD IN WAREHOUSES BY CUSTOMS

Warehouse No. 5 - 51: Small cartons of cheese, in storage three years. The cheese is now spoiled.

Warehouse 107 - 240: Cases of sponges, warehoused approximately ten years.

Warehouse No. 9 - 13: Pallets of imported beer, in storage six months. Crated boxes with goods not identified destined for Iraq, in storage four years.

Warehouse No. 10 - Open Storage Area No. 1: Five large wooden crates marked for Ministry of Radio and T.V. dated 1974.

Between Warehouses 9 and 10: Large pile of roll paper, completely damaged, in storage ten years.

Warehouse No. 7: 5,500 boxes of packaged figs weighing 120 tons, in storage seven years. The figs are now spoiled and the immediate area has an unpleasant odor. 30 round cartons marked "manufacturer Lowe and Carr for delivery to Radwan Dahhan, Aleppo," three years. 14 tons of cargo in cartons from West Germany, After Tex Company, in storage five years.

Warehouse 112: 300 tons carbonate of soda, in storage four years.

The silos and conveyor system and ship berth were designed with an annual export capacity of 650,000 tons of grain. The years 1972 and 1973 were the only times that grain was exported. As a result, the ship berth and conveyor systems have been underutilized. This is particularly unfortunate because the ship grain berth, as designed, cannot be used for other cargo movements. The import grain ships must use a berth on the Main Quay. The problem is further aggravated since the berthing area on the Main Quay has the few necessary deep-water berths for heavily laden ships.

In many instances, it is necessary for grain to move directly by rail to its destination. There are two problems associated with long-distance movement. First, it is reported that there are only 250 grain rail cars in Syria. A sufficient number must be assembled before the vessels begin discharging in order to expedite ship turnaround and reduce demurrage charges. Second,

once the ship begins discharging, full cars must be moved from the quay and empty cars must be quickly positioned alongside the ship.

Often the port locomotive switch engine is employed in other areas of the port, and the mobile car switch truck is not available. These operational problems and the time needed for switching create great delays to the vessel. If these difficulties cannot be overcome by improved rail scheduling, winch-type car movers should be installed alongside the track. This will allow the available laborers to position the cars when the other car movers are not available.

Transfer of Grain

The grain silos were designed and constructed strictly for grain exports approximately 15 years ago. The silos are connected to the overhead conveyor and delivery system on the pier by a long horizontal conveyor. Traveling on a track fastened to the base of the silos are moving loading arms for the delivery into the holds of the vessel.

With Syria now a heavy importer of grain, it has become necessary to convert the present export system to handle imports, utilizing the same equipment and structures. In order to accomplish this, the following recommendations should be implemented:

- All the conveyors are motor driven with gear reducers to pulleys to drive the belts. By the electrical reversal of the motors, the conveyor belts can be changed to take in grain from ships. This is a simple matter, and requires that only two wires be moved on each motor.

- To assist in the gravity flow of grain, the belt elevations will require modification. This can be accomplished by jacking up the pulley support carriage assembly to lift the belt, at the same time cutting the frames down at several sections.

- A problem requiring some minor engineering is at the central station, where the silo delivery conveyor has a junction with the pier conveyor system. At present, the silo conveyor is above the pier conveyor for delivery outbound. The belt support frames must be changed to place the pier receiving belt over the silo delivery conveyor, reversing the flow to the grain elevators and storage.

- The silo delivery conveyor is connected to the internal elevators over the silo control tower for distribution from the

silos. This system cannot be reversed without excessive and unnecessary expense. The Consultants recommend that a cut-off be made just prior to the tower in the silo delivery belt. This cut-off can be connected to a small receiving cyclone or funnel to a vertical tube extended from the control tower to the truck receiving area, where it would utilize the present silo feed system of underground conveyors and escalators.

- A careful engineering study should be undertaken to ascertain the best method of utilizing the vacuvators now used by the port and the new vacuvators on order to lift the grain from the vessel to the overhead conveyor system. Some alternatives are as follows:

a. Continue the present method of mounting the movable vacuvators to the deck of the vessel and blowing the grain upwards to a cyclone and drop sleeve onto the conveyor belt.

b. To increase volume, mount a vacuvator to operate in tandem with a shipboard vacuvator on an undercarriage on the present loading arm support rails and then to inbound conveyor.

c. Mount vacuvators on the present loading arms above the structure.

The important point of these recommendations is that there is no structural or mechanical reason for not using the present facilities for the import of grain. The modifications recommended are minor and could be accomplished in a matter of weeks or months, thereby making another berth available and reducing unloading time and handling charges.

Vacuvators

The present eight vacuvators operated by the silos were recently purchased. They are maintained and repaired separately from the other port equipment by the silos mechanics. The port engineer inspected them in and out of operation and, except for the usual minor repairs needed, found them to be in reasonably good condition. Inspection of the oil sticks while in operation showed considerable grit. If these expensive machines are to have a long serviceable life, the oil and the oil filters must be changed often. Since these machines are operated in a hot, dust-filled, and dirty atmosphere, frequent inspection is required to check on their oil, grease, and battery water level.

B-3.11 SHIP AND LIGHTER REPAIRS

The center for repairs to lighters and harbor small craft is located at the foot to the Slipway Quay. This repair facility

is limited to vessels not exceeding 800 tons. The slipway for hauling boats out of the water has experienced a foundation failure at, and just below, the waterline. At this time it is out of service. The failure in the slipway is creating a backlog of vessels awaiting annual inspection, hull repairs, cleaning, and maintenance painting.

The failure of the slipway foundation takes on added importance as it is the only such slip repair facility in Syria. At this time, lighters and vessels of less than 100 tons can be lifted from the water and placed in the repair yard by the use of the heavy lift floating crane.

B-3.12 FIRE DEPARTMENT

The fire station, centrally located alongside Warehouse Building 204, is under the jurisdiction of the Fire Chief, who reports to the Chief of Port Security. The station consists of a one-story office and spare parts room with an adjoining covered shed area for the fire-truck, mobile pumping machines, and fire smothering machines.

Types of Fires

For the most part, the 28 recorded fires occurring in 1978 were minor, consisting of trash and old cargo crates, cargo in lighters, and minor ship fires. None of these fires spread or went out of control. Injuries to the firemen have been minor, occurring only twice in the past two years. This is indicative of an efficient and experienced fire department.

Automatic Sprinkler System

In the limited number of three-story warehouses, specifically Warehouse Buildings 2, 3, 202, and 203 and the Free Zone Warehouse, automatic fire sprinkler systems were installed in 1958. They have not been tested since then. It is now beyond the generally acceptable period when the heat melting elements should be examined for deterioration and renewed as required.

Automatic Fire Alarm

The automatic fire alarm system installed in the buildings has been disconnected. It is reported that the system has no instruction book or list of spare parts. The reason given for disconnecting the system was the high incidence of false alarms. Although the port has not experienced a major fire, the manufacturer's recommendations on repair should be sought and the system placed in working order.

Fire Main

The present fire main and sea water pumping station appear to be adequate for the port's requirements. Since pumps are not started until requested by the fire department, however, delays of from 5 to 10 minutes result before there is a sufficient build-up of water pressure to quickly combat a fire and to prevent it from spreading. The port's fire main system should be kept in constant operation with the fire main under pressure at all times. The fire pump station and two pumps now operate with automatic starting and stopping remotely controlled.

Port Fire Inspection

Under the present fire prevention organization, it is the responsibility of each warehouse manager to report used and empty hand extinguishers to the fire department for refilling or replacement. Many of these extinguishers are empty, broken, or located in inaccessible places. In addition, although the inside warehouse fire mains are under a separate fresh water line with very low water pressure, fire hoses, in most cases, are not connected for quick usage.

Location of Mobile Fire Equipment

The present shed covering the mobile fire equipment is too small for the equipment it shelters. The fire truck, ambulance, and Land Rover are parked in the entrance with other unpowered mobile equipment grouped immediately behind. Response to a fire with the mobile towed equipment is delayed by the need to jockey the Land Rover tow bar to the machines.

Fire Equipment and Condition

The following is a list of existing fire equipment, the year of purchase, and current condition.

Quantity	Year of Purchase	Type	Condition
1	1977	Volkswagen converted to ambulance	Good
2	1965	1,000 lb chemical foam smothering machines on wheels with tow bar	Good
4	1965	850 lb chemical foam smothering machines on wheels with tow bar	Good

Quantity	Year of Purchase	Type	Condition
1	1965	575 lb chemical foam smothering machine on wheels with tow bar	Good
1	1959	Land Rover with tow clamp, and a mounted sea suction pump. (This is the only powered vehicle available to bring the towed equipment to the scene of the fire.)	Fair
1	1975	Water-foam-fog smothering machine on wheels with tow bar	Good
1	1975	Water-foam-fog smothering machine, hand portable	Good
4	1974	Sea suction pumps on wheels with attached hoses. (One machine has a broken pump. There is no spare and no catalogue of spare parts. This expensive machine is now useless.)	3 Good 1 Poor
1	1972[1]	Fire engine equipped with CO^2 system and hose, portable extinguishers, high pressure water jet mounted on turret. Foam-water-fog system for smothering fires needs repair. Spare parts are not available. Sea suction pump needs repair; there are no spare parts, suitable hoses, or miscellaneous equipment.	Fair to Poor

[1]This fog system is expensive and well maintained except that it requires spare parts. Each machine has the manufacturer's name plate with appropriate data on type and serial number. The manufacturer should be written to, with the complete equipment data given, to request instruction books and parts catalogues.

B-3.13 HARBOR WORKSHOPS

The workshop area consists of seven repair buildings and one spare parts building centrally located directly south of the slipway. The general condition of the buildings housing the various shops is from good to poor. Both the equipment and shop areas are, in most cases, inadequate to handle the expanding workload. They also have the general problem of poor lighting.

Machine Shop

This shop and its adjacent welding and fabricating shop handles all the machine work for the port. The shop is adequately maintained. The equipment is old and, in some instances, worn beyond the point of being capable of precision work.

Mobile Crane and Forklift Repair Shop

This is a large, well-constructed building with extra high ceilings and eight doors that provide clearance for inside access and most mobile cranes. The shop employs 17 people, divided between laborers and mechanics. The primary work performed here is engine and body repairs.

Provision within the building structure was made for traveling overhead cranes. Unfortunately, these were never installed.

With the exception of one tripod chain hoist pole, there are no lifting devices.

The basic equipment for this repair work is very limited. The building should have work pits and hydraulic mobile lifting devices for under-engine repairs and drip pans for oil. At present, machines are chocked up with wood. In order to lift a front end of one machine, a crane is required.

The shop is notably lacking in simple work benches, vises, drills, grinders, and parts cleaning tanks. There is a lack of proper lighting for this type of work.

The following list of equipment awaiting repair is an indication of the workload and the lack of facilities and manpower for its accomplishment.

- On July 5, 1979, there were 3 mobile cranes and 18 fork trucks inside the building in various stages of disrepair. On the outside, awaiting repair, were 10 mobile cranes and 8 forklift trucks.

- On July 10, 1979, there were 2 mobile cranes and 12 forklift trucks inside. On the outside, there were 7 cranes and 12 forklift trucks awaiting repair.

- On July 16, 1979, there were 8 fork trucks and 1 crane inside and 8 fork trucks and 14 cranes outside.

- On July 22, 1979, there were 12 cranes and 2 forklift trucks outside awaiting repair. No observation was made onthat day of the vehicles inside the building.

Electric Motor Repairs

Due to multiple manufacturers of port equipment, unavailability of spares for older equipment, and the wide range of motor size and type, the port must rely on its own ability to rewind motors.

Again, the backlog of various types of machines awaiting repairs, such as mobile cranes that need electric motor repairs, indicates the inadequacy of this shop. For example, there were five cranes awaiting motor repairs on 5 July, seven cranes on 10 July, and eight cranes on 16 July.

Battery Charging Room

The shop consists of a small room containing three battery chargers and a small boiler for making distilled water. By count, there were 20 batteries waiting to be charged. This shop needs to be equipped with at least three additional battery charging machines.

Yard Trailer Repairs

One small shop handles yard trailer repairs. Most repairs are to the wheels, axle tree, and towing yokes. The high incidence of this type of repair is an indication of gross overloading. On 10 July 1979, there were 11 units outside this repair facility awaiting repair.

B-3.14 FLOATING EQUIPMENT

The port's floating equipment is considerable, amounting to 72 units that include tow and tug boats, floating cranes, lighters, and personal and pilot boats (see Tables B-3.5 and B-3.6). In general, the equipment is in good condition. As can be expected, the older equipment that has been in constant use is showing visible wear and tear.

Table B-3.5

INVENTORY OF EXISTING FACILITIES: PORT OF LATTAKIA CRANES, TUG BOATS, AND PILOT BOATS

Item	Number		Type or Capacity	Year Purchased	Estimated Remaining Life (years)	Condition
	On Hand	Operational				
Floating Crane	1	1	100 ton	1958	10	Good
	1	1	30 ton	1976	20	Good
Tow Boats	1	0	30 HP	1950	0	a
	4	0	35 HP	1951	0	a
	2	2	85 HP	1960	5	Fair
	2	2	265 HP	1961	7	Good
	1	1	172 HP	1970	11	Good
	1	1	300 HP	1973	14	Good
	1	1	150 HP	1973	14	Good
Pilot Boats	2	2	300 HP	1976	20	Good
	2	2	150 HP	1976	20	Good
Tug Boats	1	1	660 HP	1956	4	Good
	1	1	1100 HP	1970	15	Good
	1	1	750 HP	1976	20	Good

Sources: Port records and Consultants' inspection.

[a] Should be scrapped.

Table B-3.6

LATTAKIA PORT EQUIPMENT: LIGHTERS

Number of Units	Year of Manufacture	Place of Manufacture	Condition
13	1958		Fair
8	1958	Hungary	Fair
20	1961	Lebanon	Fair
4	1965	Lebanon	Fair
4	1975	Lattakia, Syria	
1	NA	NA	Fair[1]
1	NA	NA	Fair[2]
51			

Sources: Port records and Consultants' inspection.

Notes: Lighters are in constant use. By the nature of their work, they are prone to damage. Four or more units are under repair at any given time.

NA = Not available.

1 Fresh water delivery to ships.

2 Ship garbage disposal.

B-3.15 SHORE EQUIPMENT

Because of the wide dispersal of mobile equipment used throughout the port, there was difficulty in matching the reported inventory with the actual number of machines available. Review of equipment in use and certain derelict vehicles scattered throughout the port indicates that some equipment has been stripped for spare parts and other equipment has been abandoned as useless. In some cases, this derelict equipment may still appear on records as operating equipment.

From an analysis of a random sample of equipment undergoing repair and unused equipment in the Motor Equipment Pool, it appears that the port is oversupplied with equipment, much of which should be disposed of by sale or scrapping. It is not economically feasible to maintain a large inventory of old equipment that spends much of its time unproductively in the repair shops, a practice that places an undue strain on the limited repair facilities.

It was observed that out of 90 reported forklift trucks, there was an average of 25 under repair and 18 in the Motor Pool, or 40 unproductive units per day.

Tables B-3.7 to B-3.11 include an inventory of equipment by number, year purchased, and condition.

B-3.16 CARGO HANDLING

The tons of cargo handled in the Port of Lattakia per stevedore gang hour from vessel to truck or to transit shed fall considerably below prevailing rates in world ports.

Neither the Port Company nor statistical records were able to supply actual records of ship loading and discharge rates by type of tonnage handled. However, the Operations Department reports average daily rates of discharge. These reports were checked against random time studies at ship berths. With the exception of a number of variables that enter into such operations, the time studies generally confirmed the reported rates of productivity. These rates, compared to an acceptable average port discharge rate, are shown in Table B-3.12 below.

Table B-3.7

LATTAKIA PORT EQUIPMENT: SPECIAL EQUIPMENT

Number	Year Purchased	Company or Country of Manufacture	Type and Condition
1	1958	Clingen	Tow truck-No good
1	1962	Dingler	Road paving roller-Fair
1	1962	Mack	Road paving roller-Fair
1	1962	Dempsey	Dump truck-Fair
2	1968	Popprads	Tow truck-No good
1	1976	Belcon	Tow truck-No good
1	1976	Belcon	Tow truck-Fair
2	1977	Henley	31 ton container carrier-Good
1	1977	Caterpillar	31 ton container carrier-Good
1	1978	Mitsubishi	31 ton container carrier-Good

Sources: Port records and Consultants' inspection.

Table B-3.8

LATTAKIA PORT EQUIPMENT : MOBILE CRANES

Number of Units	Year of Manufacture	Company or Country of Manufacture	Condition
1	1956	Coles 4 to 5 ton	Not operating
2	1957	NEAL	Need spare parts-Fair
5	1958	P & H	Some need spare parts-Fair
1	1958	Johnson	Requires spare parts-Fair
2	1959	Coles	Used for repair shop work-Poor
1	1962	Coles	Used for repair shop work-Poor
1	1962	Johns	Good
3	1966	Mashner	Fair
2	1968	Wares	Poor
8	1972	Proutous	Fair
1	1972	P & H 22 ton	Good
1	1975	P & H 75 ton	Fair
4	1975	Coles 12 ½ ton	Good
30	1976	Poclan, French 18 ton capacity	Very good

Sources: Port records and Consultants' inspection.

Table B-3.9

LATTAKIA PORT EQUIPMENT: FORK TRUCKS

Number	Year Purchased	Company or Country of Manufacture	Condition
3	1965	David Brown-English	Fair
10	1968	Tarcraft	Not working
11	1970	Sameki-French	Fair
3	1974	Euphrates	Fair
24	1975	Lancer-British	Fair to poor
30	1976	Mitsubishi-Japanese	Good
7	1958	Shnainback	No good
2	1958	Slingen	No good
90			

Sources: Port records and Consultants' inspection.

Table B-3.10

LATTAKIA PORT EQUIPMENT: YARD TRAILERS

Number	Year Purchased	Company	Condition
4	1974	Euphrates-Syria	Fair to poor
15	1974	Ebro-Spain	Fair to poor

Table B-3.11

LATTAKIA PORT EQUIPMENT: YARD TRACTORS

Number	Year Purchased	Company	Condition
9	1956	David Brown	Fair to poor
1	1958	Clingen	Fair
4	1959	Mann	Fair
1	1965	David Brown	Fair

Sources: Port records and Consultants' inspection.

Table B-3.12

THROUGHPUT BY CARGO TYPE

Type of Cargo	Average Port (ton/hr)	Lattakia (ton/hr)	Desired % Increase
Heavy Cargo	17	8	113%
Wood Bundles	15,000 board m	1,500 board m	900%
Cotton Bales	15	5.3	183%
General Cargo	17	5	140%
Iron & Steel	16	13.5	19%
Cement	16	15	7%
Flour	13	6.6	97%
Containers	25 per hour	4 per hour	525%

Sources: Port Authority of New York-New Jersey documents.
Port of Lattakia records.

Thus, there is considerable potential for productivity improvement in the port operations at Lattakia. Based on a 12-hour day, the estimated average tons per gang hour in the Port of Lattakia was 8.9. This is 75 percent below the average port.

On 21 July 1979 time studies were made in the port. They provided the following information on time delays experienced by the Syrian Navigation Company vessel LATTAKIA, a small, two-hatch ship.

Vessel Operation	Recommended Operation	Time Delays (minutes)
1. Vessel arrives at berth 0815.	Vessel should arrive and be ready for 0700 start.	
2. Vessel ties up 0830.	Vessel should have been tied up before 0700 for a 0700 start.	
3. Vessel cargo hatches opened 0850.	Vessel should have hatches open on arrival.	
4. (Fwd hatch) first truck arrives 0855.	Truck should have been waiting for ship.	115

Vessel Operation	Recommended Operation	Time Delays (minutes)
5. (Fwd hatch) first sling of cargo from vessel 0905.	Cargo should have been ready for immediate delivery to truck.	10
6. Sling leaves truck; delay caused by hand unloading on truck; second sling load leaves vessel 0918.	Palletized cargo could be left on the truck and the boom returned to the vessel. Average boom cycle time should be 3 min.	10
	Forward Hatch--Lost Time: 135 min.[1]	
7. Second hatch does not start work until 0900.	Should have started at 0700.	120
8. First sling to truck 0900. Second sling to truck 0905. Third sling to truck 0925.	Truck not available.	20
	Second Hatch--Lost Time: 140 min.	
	TOTAL Lost Time.....275 min.	

[1]For the remaining four hours of observation, the discharge rate from the forward hatch approached normal. When trucks were available, the cycle time for ship to truck averaged one sling load every four minutes.

The vessel delays show that considerable time is lost through poor planning and lack of coordination between ships and port operations. This accounts for a large part of the low productivity rate at Lattakia.

Factors that lead to low productivity and vessel delay are as follows:

- Vessels should be in position at the berth with the hatches open and the booms in position for a 7 a.m. work start.

- Lost time waiting for an uneven arrival of trucks is a major contributor to time delays.

- Using slings for cargoes that should be on pallets delays the ship cargo boom cycle. This is largely caused by the boom waiting for the cargo to be unloaded from the sling and returning it to the ship. While pallets are the preferred method for handling most cargoes, a supply of extra slings in the ship's hold would allow the boom to return without waiting for the sling. The empty sling could be picked up on the next boom cycle.

- Stevedore crane and fork truck operators start at the same time as other gang members. However, they must proceed to the equipment pool, check out their machine, and bring it to the work site. As a result, while the gang is at the ship for a 7 a.m. start, the equipment generally does not arrive until 8 a.m. Equipment operators should start at 6 a.m. The cost of overtime for one or two equipment operators is more than offset by the man hours of productivity gained by the stevedore gang and resultant decreased demurrage costs.

In the above example, vessel time delays resulted in the loss of four and one-half production hours. If these delay factors are typical, then the annual loss of cargo productivity due to this one factor alone is over 80,000 tons. This loss of production could be eliminated with proper coordination and planning.

The Port Company Operations Department should keep an accurate record of the cargo handling productivity on each ship. These records should note the actual working and delay times and causes for delays. These records should be reviewed and summarized so that supervisors can take corrective action.

B-3.17 CONTAINER HANDLING

In 1979 containers entered the port on three types of vessels, namely: roll on/roll off, full container ships, or combination break-bulk and container ships.

Containers on combination ships carried either on deck or in the square of the hatch opening, mixed with conventional stowed general cargo, are the port's most serious handling and storage problem. Because they are 2.5 meters by 2.5 meters by 6 or 12 meters in length and weigh up to 20 tons, neither the ship's

cargo handling equipment nor the quay cranes have the capacity to lift them. The only presently available method for handling containers from this type of cargo ship is by the use of the port's floating crane. Considerable time is lost positioning the crane on the outboard side of the vessel. The floating crane boom must then be extended across the ship's beam while avoiding the ship handling booms, mast, and stay wires. This requires considerable skill and is a time-consuming operation.

It should be noted that in a similar operation at the Port of Tartous, the floating crane is positioned between the quay apron and the vessel, which approximately doubles productivity in handling containers. The Port of Lattakia is now obtaining a mobile heavy lift container crane. With this crane, the operator will be able to control the container-lifting device automatically. When this equipment is placed in service, container handling efficiency to and from ship to quay should increase from 4 to a maximum of 25 per hour.

Assuming the present method for handling containers on and off vessels allows for handling four per hour, the total time spent for this activity in May of 1979 would theoretically have been 993 hours. If these units had been handled by a mobile container crane with an automatic spreader lifting device at a maximum rate of 25 per hour, the total hours required would have been 159, or a savings of 834 vessel hours, or $125,000 in direct vessel time costs alone. (Depending on the queue, the total saving would be two or three times greater.)

Because the containers themselves are a form of storage unit and their number is increasing, a number of present warehouses are no longer required. Once these warehouses are removed, the open spaces should be used for container storage. This will reduce travel time and road congestion from the quay to the new storage areas.

The congestion caused by these movements can also be alleviated by initiating one-way traffic on most of the roadways in the port.

Another problem associated with the increasing number of containers handled in the port is the number of empty containers requiring storage space until the vessel returns to the port. Other shipping companies with large container movements should be encouraged to lease similar space outside the port similar to the Merzario yards. The Port Administration should also determine which shipping companies serving the port now provide similar trade route service. Discussions with the shipping agents should then take place to attempt to establish interchange pooling arrangements for the back-haul of empty containers. This would also relieve the port of providing space for long-term empty container storage.

B-3.18 RAIL MOVEMENTS

Rail Freight Movements

Rail service to the Port of Lattakia commenced in 1975, but there will be no connection south of Homs to Damascus until about 1984. At present rail service is virtually confined to the northern half of Syria on the Lattakia-Aleppo-Al Kamishli line, and the movements from the port are primarily foodstuffs and construction materials.

The Lattakia Port Company does not record cargo tonnages moved by rail. Table B-3.13, showing rail movements to and from the port, was developed from the records of the Chemin de Fer Syrien. The figures shown are planned movements for 1979, the actual traffic is thought to have fallen about 30 percent below that planned.

Table B-3.13

RAIL FREIGHT TRAFFIC - PORT OF LATTAKIA - 1979

Imports		Exports	
Commodity	Tons	Commodity	Tons
Structural Steel	30,000	Bulk Cement	20,000
Timber	30,000	Ginned Cotton	50,000
Bagged Cement	15,000		
Fertilizer	25,000		
Sugar	40,000		
Rice	25,000		
Miscellaneous	50,000		
Total Planned	215,000		70,000
Estimated Actual	150,000		50,000

The estimated rail movement of 200,000 tons represents only 11 percent of the total general cargo moving in and out of the port. This percentage is very small. However, the completion of the rail link between the port and Damascus before 1985 offers a great potential for increasing the rail percentage of surface transport and relieving the present problem of truck shortages.

Rail Operations

There is little or no coordination between the port operations management and the railway management. Statistical information on cargo movements is not available. There is no planning to determine rail capability and its role in serving the port. Also, there is no scheduled rail service to the port. If ship agents are to use or encourage rail transport, they must be confident that the rail service will be reliable and the goods will reach their destination within a reasonable amount of time at a comparable or lower cost than the more flexible direct trucking.

The Lattakia Railway Branch Manager does not attend the meetings of the port committee that arranges the daily work load, although he is a member of the committee. The port should appoint a rail wagon coordinator in the Exploitation Department to work with the rail agency in order to ensure coordination. A statistical analysis should be undertaken to determine productivity of rail wagons, number of cars loaded, and commodity movements by type and season in order to plan an expanded rail role.

B-3.19 LIGHTERAGE

Due to the required double handling from ship to lighter and lighter to quay, this method of cargo handling is the most expensive as well as the most difficult handling problem for the port. There is a substantial amount of lightering at Lattakia. All ships using the six Mediterranean type moorings and those that discharge or load at anchor in the outer harbor must lighter their cargoes. Some ships commence their cargo operations by lightering, especially if it is close to their turn for a berth, and then shift to a quay to complete their operations when it is their turn. No lightering is done from ships at anchor outside the breakwater. The general procedure for handling the cargo aboard the ship is the same as for a conventional ship at a quay using its own gear.

Problems associated with the lighterage operation include:

- Delays in moving empty lighters away from the quay because loaded lighters have been moved directly behind them.

- Double handling, which increases cargo breakage, especially when pallets are not used.

- Lack of available trucks to remove the cargo from the quay.

- Poor scheduling of tractor trucks for movement into the transit sheds.

- Obsolete buildings on the North Quay that interfere with truck and crane operation when lighters are handled in that area.

- Unpalletized cargo piled into lighters in a jumbled fashion, causing difficulties in sorting and handling when unloading.

- The availability of only two lighters for handling containers.

The resulting delays contribute to an apparent lighter shortage. In fact, there is no shortage of lighters, nor is there space at the quay for additional lighters. The present lighters are being underutilized, although in some cases they are not designed for the cargo they are carrying. Most lighter time is spent waiting. This contributes to vessel delay. Lighters should not be used for short-term storage.

New lighters should be acquired as needed only to replace the old lighters as a temporary arrangement until the expanded port construction is completed. New lighter replacements should be designed with shallow wells or flat decks in order to facilitate rapid pallet loading and unloading. The new lighters will, with the use of dock boards, provide ready direct access to the lighter by fork trucks, thus providing both fork truck and crane unloading adaptability to match the type of cargo to be handled.

Inspection of lighters being loaded from ships in the harbor showed that some vessels were provided with only one lighter, and two vessels were discharging cargo to two lighters each, while others were moored with no lighters alongside. It is difficult to ascertain how much cargo each ship was to discharge or how many holds on the ship held cargo for Lattakia.

Full lighterage should be provided for each ship corresponding to the number of hatches being worked. On most general cargo ships one hatch can discharge to both sides of the vessel at the same time. Thus, a lighter on both sides of the hatch being worked would reduce discharging time by one-half.

B-3.20 TRUCK TRANSPORT

In 1978 trucks handled an estimated 90 percent of the 1,751,000 tons of cargo that moved through the Port of Lattakia; this

percent share was almost certainly the same in 1979. Fifty-six percent of the cargo handled by truck - 53 percent of imports and 76 percent of exports - was directly delivered between ship and truck.

Based on overall O & D survey data and 285 working days, in 1978 an average of 407 trucks served the Port of Lattakia each day. The breakdown by type was:

- 187 two axle trucks
- 114 three axle trucks
- 106 combination trucks

The 2-axle trucks accounted for 46 percent of the cargo movement, or 714,000 tons. The 3-axle trucks handled 28 percent, or 434,000 tons, and the combination trucks carried 26 percent, or 403,000 tons.

Trucks, and their availability, are critical elements in the productivity of the port, and other sections of this chapter contain recommendations concerning road access and other factors affecting truck congestion. Direct loading to or receiving from trucks or rail wagons is the most efficient method of cargo handling, and it should be encouraged. However, there are not now enough trucks available to keep the cargo handling gear and labor working steadily. Depending on the size of the ship queue and other factors, every minute lost waiting for a truck costs Syria SP 40 or more in addition to the direct costs of idle labor and equipment. Every action possible should be taken to minimize these delays.

One major cause of the shortage of trucks is reported to be the real difference in hauling rates for public versus private cargo. This problem is discussed in detail in Volume IV.

Trucks for the port are dispatched by the Government-controlled Lattakia Cargo Transport Office (CTO). The CTO dispatches trucks to the port in the order of their arrival at the depot, but there are not always sufficient trucks to meet the requests. In addition, the number of trucks being dispatched to the port or to a particular vessel on any given day is often unknown to the port operating management. Under these circumstances it is nearly impossible for the port operating department to properly schedule manpower or to control productivity.

Information on the number of trucks available must be in the hands of the port operating department prior to its two daily planning meetings. The department must know how many trucks are to be sent to the port, and there must be strict control of their scheduling. The trucks should be dispatched to coincide

with the vessel delivery rate. Sufficient trucks must be on hand at all times to provide immediate positioning under the ship's cargo boom or shore crane. The timely availability of surface transport in sufficient numbers to meet the requirements of the port should be given top priority by the concerned agencies.

The port should also establish a rule that if a truck is not available, the cargo should be palletized and stacked by fork-lift away from the operations, either to open storage or transit sheds. This alternative defeats to some degree the efficiency of direct delivery, but this loss is more than made up by reducing the turnaround time of the vessel, and since the transit handling costs are borne by the shipper, it should give an additional incentive to have trucks available on time.

B-3.21 COMMENTS ON THE PLAN FOR THE EXPANDED PORT

The following comments on the plan for the expanded Port of Lattakia are based solely on a review of the General Arrangement Plan. A more careful analysis could be made only if the planning criteria were available for extensive review.

The problems associated with matching vessel and terminal productivity in expanding economies and new ports are universal. They center on the difficulty of adjusting to new shipping technology, financing, congestion caused by limited road and rail access, lack of coordination in the intermodal exchange of containers, and low labor productivity. Ports that cannot match the vessel cargo-handling efficiency will continue to pay the cost of delays by increasing surcharges on the cargo transportation costs.

Road Access

In the general layout for the expanded port, road access to and from the port appears to be restricted to one gate at the port's far north section. It appears that truck traffic will be routed through the section of the city known as "New Lattakia." Unless there are considerable plans to enlarge the roadway through the city and the road leading to the main highway, truck congestion will be a major city and port problem. For example, the Consultants' estimated annual total throughput tonnage for the year 2000 is 4.2 million tons for the present and expanded port. If 15 percent of the traffic is handled by rail, the remaining traffic for truck delivery is 3.6 million tons. Assuming the present average load of 13.35 tons of cargo per truck, the annual number of trucks would total 267,000. With 350 working days per year, this is 764 trucks per day. If an eight-hour day was worked at the port, for example, the

number of trucks per hour would total 96, or 1.6 trucks per minute. Allowing for empty trucks arriving, this number would double to 3.2 trucks per minute passing through the gates, either inbound or outbound. Even if less cargo were handled by truck and a greater share were borne by rail, or the percentage of larger trucks increased, the trucking requirements would still be unmanageable for the city streets.

Railway Access

Railway access to the port and the problems it creates for road transport and general port operations have to be considered in the context of the national transport network. The railway from Lattakia to Aleppo was constructed primarily to serve the port. To take advantage of this mode of transport, proposals are made (Volume III) to improve the coordination between port and railway operations at the technical level.

Rail movement to the expanded port is a continuation of the present line that enters from the extreme south portion of the present port. Rail movement of any consequence through the present port to the expanded port will interfere with road traffic entering or leaving the port. Following the series of curves the rail line must make in order to accommodate the topography of the present port, both the Main Gate and South Gate will be bisected. In addition, activity on the East Quay, South Quay, and North Quay will be disrupted. Review of the berth allocations under the expansion plan indicates that the present berthing areas on these quays are to be eliminated. The total present port area eliminated by rail access to the expanded port therefore represents a considerable loss of high-value property.

To ensure minimum interference between railway and road transport, the possibility of grade separation at points of conflict should be investigated. The sloping site of the port should allow this to be accomplished.

There is a possible development of rail freight train ferry service at Lattakia. Such a development would embrace a high volume of cargo movement. Should such a service be instituted, the expanded port must be designed with the flexibility to adapt to this change. Review of the general layout indicates that the most acceptable and economic (in terms of space) location would be in the berth area shown as number 13. (The potential for rail ferry service between Greece and Syria is discussed in Chapter A-8, Volume III.)

Container-Handling Berths

The rising trend in the number of containers handled by conventional cargo ships in the port is most disruptive to the present port operations in terms of vessel delays. This is caused primarily by the lack of modern container cranes, inadequate quay apron widths, restrictive roadways, long-term storage of empty containers awaiting re-delivery to their vessels, and space limitations.

It was observed that the present use of the floating crane to discharge containers required 35 minutes to unload two containers.

For the above-mentioned reasons, it is suggested that a high priority be given to the construction of the container terminal shown on the general layout. Further consideration should also be given to the need for, and sizing of, the transit sheds shown.

Berth Lengths

The 180-meter design berth lengths for general cargo ships would be adequate for most vessels currently using the port. After allowing approximately 15 meters for vessel mooring lines, the berth space of 180 meters would provide for vessels with a maximum length of 165 meters. However, the trend in new vessel construction (Table B-3.14) indicates that this design berth length will not meet demand in the near future. Vessels are currently being constructed larger than they previously had been and will require more than 180 meters of berth space.

The general layout shows two vessel turning basins of 480 meters in diameter. Based on the Journal of the Waterways, Harbors, and Coastal Engineering Division of the American Society of Civil Engineers, the planned maneuvering area or turning basin will meet the criteria for ships up to 245 meters in length with the assistance of the port's tug boats.

The entrance channel alignments and associated channel widths and natural water depths appear to be ample to meet future port requirements.

Maintenance and Repair Shops

The Consultants' recommendations for improvement to the present port included undertaking a study for the restructuring of the

Table B-3.14

NEW SHIP CONSTRUCTION

Name	Country or Company	Length in Feet	Length in Meters	Width in Meters
Ming Spring	Taiwan	565	172	
Ming Autumn	"	565	172	
Ming Summer	"	565	172	
Ming Winter	"	565	172	
Container Ship	Sealand	662	201	
Falcon	Spain	515	157	
Eagle	"	515	157	
(Not Named)	Transfreight Line	515	157	
Pishgan	Iran	465	141	23
M/V Nobollane	(Auto Carrier)	646	196	28
(Not Named)	Evergreen Line	550	167	24
M/V Lagos Star		528	161	75
M/V Shenandoah	Hoegh Line	580	176	
Hoegh Merit		660	201	
Seatrain Charleston	Seatrain	856	260	
Seatrain Asia Liner	Seatrain	800	243	

Sources: Hamburg, New York, and South Carolina Port Publications, 1978-1979.

maintenance and repair shops for mobile cargo handling equipment. It appears that under the expanded port plan, this function would be relocated to the area marked 17 at the far north section of the port. Considering the magnitude of planned development and the distance from the planned shops to the retained berths 1 through 6 in the present port, the recommended rehabilitation of the present workshops should be implemented. The concept of a central maintenance area for all repairs is generally considered good; however, the distance to be travelled for vehicles undergoing repairs, in this instance, is too great. It is thus recommended that two such maintenance areas be provided.

Expanded Port Annual Capacity

From a review of the estimated tonnage capacity of the expanded port, First Stage Development (Quays 7 to 16) appears to be underestimated. When the estimated 180,000 tons per quay of general cargo are compared to the present design quay tonnage of 160,000, the annual increase in productivity is relatively modest. It would appear that there was little adjustment made for the increased efficiency of vessel cargo-handling capability. Additional cargo capacity per quay should be anticipated by the trend to unitized loading either by palletization, pre-slinging, or containers.

It is recommended that trends in vessels, tonnage projections, new cargo handling equipment, and availability of surface transport be under constant review during the construction period in order to modify the design of the port as required.

CHAPTER B - 4

FINANCE

Chapter B-4

FINANCE

B-4.1 HISTORICAL EVALUATION

From a financial viewpoint, operation of the Lattakia Port Company has been quite erratic. Revenue and expenses per ton have increased dramatically, but not in any continuing apparent relationship to port activity. Operating and financial indicators shown in Table B-4.1 indicate that tonnage throughput during these nine years has varied, as might be expected, with respect to political activities in the region and that both total tonnage and tonnage per ship have generally declined over this period. Revenue per ton increased rather steadily from SP 14 per ton in 1970 to SP 21 in 1974, jumped to about SP 29 in each of the next three years as a result of higher tariffs, then shot up to SP 39 in 1978 as a result of the substantial increase in storage charges made effective 1 January 1978 by Presidential Decree No. 2637 of 22 December 1977. Expenses per ton increased rather steadily from SP 9 in 1970 to SP 18 in 1975, then held at that level for three years before increasing to SP 30 in 1978 - probably the result of the year's decreased tonnage being handled by the same number of workers. As a result, profit per ton increased gradually from SP 5 in 1970 to SP 7 in 1974, increased to SP 12 in 1975, fell to SP 9 by 1977, and then increased again to SP 10 in 1978.

Some insight to the port company's ability to manage its expenses may be gained from the statements of revenues and expenses shown in Table B-4.2. While total operating expenses increased from SP 19.5 million in 1974 to SP 40.3 million in 1978, they increased only from 53 percent of total revenue in 1974 to 57 percent in 1978. Wages and salaries, by far the largest component of these expenses, fluctuated between 43 percent and 52 percent but moved around a remarkably consistent 48 percent of revenues. As new facilities were added during the port's expansion program, depreciation increased from 5 percent of revenues in 1974 to 11 percent in 1978. By holding administrative expenses at a rather steady level, its proportion of revenues declined from 10 percent to 7 percent over this period. The net result of these shifts has been a decrease from 32 percent to 25 percent in profit before tax, even while it increased from SP 12 million to SP 17 million in absolute terms.

Balance sheets as of December 31, 1977 and 1978 are shown in Table B-4.3. By increasing current assets and reducing current liabilities, the company was able during 1978 to eliminate its net working capital deficit. Annual depreciation was more than

Table B-4.1

LATTAKIA PORT COMPANY OPERATING AND FINANCIAL INDICATORS

Year	No. of Ships	Tonnage (000)	Revenues (SP 000)	Expenses (SP 000)	Profit Before Tax (SP 000)
1970	1,570	1,941	27,287	17,675	9,612
1971	1,519	1,633	21,677	17,269	4,408
1972	1,748	1,651	26,768	17,924	8,844
1973	1,481	1,297	27,052	19,160	7,892
1974	1,744	1,776	37,122	25,227	11,895
1975	1,915	1,653	50,454	30,543	19,911
1976	2,496	2,182	61,896	39,100	22,796
1977	1,976	2,132	61,683	43,059	18,624
1978	2,030	1,783	70,095	52,817	17,278
1979	NA	2,458	NA	NA	NA

Source: Statistical Bulletin and Company statements.

Table B-4.2

LATTAKIA PORT COMPANY REVENUES AND EXPENSES

(SP 000)

	1974	1975	1976	1977	1978
REVENUES					
Vessel Charges	1,023	1,312	1,588	1,244	1,293
Charges on Goods	31,860	44,461	54,162	53,795	63,347
Other	4,239	4,681	6,146	6,644	5,455
Total Revenues	37,122	50,454	61,896	61,683	70,095
OPERATING EXPENSES					
Wages & Salaries	17,971	21,629	29,269	32,130	33,433
Maintenance & Repairs	1,522	2,547	2,270	3,172	5,780
Fuel, oil & Lubricants			823	878	1,050
Total	19,483	24,175	32,362	36,180	40,263
Operating Profit Before Depreciation	17,629	26,279	29,534	25,503	29,832
Depreciation	1,861	1,808	2,215	5,054	7,373
OPERATING PROFIT	15,768	24,471	27,319	20,449	22,459
Administration	3,873	4,560	4,523	1,825	5,181
PROFIT BEFORE TAX	11,895	19,911	22,796	18,624	17,278

Source: Company statements.

Table B-4.3

LATTAKIA PORT COMPANY BALANCE SHEETS

(SP 000)

	1977	1978
CURRENT ASSETS		
Cash & Banks	11,586	10,954
Receivables (net)	7,621	7,996
Inventories	8,903	14,105
Total Current Assets	28,110	33,055
CURRENT LIABILITIES		
Accounts Payable	29,926	22,538
NET WORKING CAPITAL	-1,816	10,517
FIXED ASSETS		
Buildings, Machines, etc.	91,181	116,569
Less: Depreciation	25,524	32,896
Net Buildings, etc.	65,657	83,673
Land	5,384	8,653
Project Under Construction	32,998	11,167
TOTAL NET FIXED ASSETS	104,039	103,493
TOTAL NET ASSETS	102,223	114,010
LONG TERM DEBT		
EQUITY		
Share Capital	54,000	54,000
Reserves	38,308	48,464
Retained Earnings	9,915	11,546
Total Equity	102,223	114,010

Source: Company statements.

the amount expended on fixed assests, resulting in a slight decrease of net fixed assets. The net gain in total assets seems to have been financed entirely by retention of profits in the equity accounts. But it must be pointed out that this is probably a misleading assumption due to the local practice of handling long-term debt as an obligation of the Government without showing it as an obligation of and cost to the individual operating companies. This practice results both in an unrealistic presentation of the company's ultimate sources of long-term financing and an overstatement of profitability without deduction of appropriate interest expenses.

B-4.2 COSTING SYSTEM

The ability of the company to manage its expenses under conditions of widely fluctuating activity is rather impressive when one realizes the lack of financial information which is provided on a current basis for making important decisions. The company does not have a cost accounting system - expenses are aggregated only on a gross basis, and cost centers are not identified. This absence of a cost accounting system impedes management's ability to plan and control costs. Management is unable to pinpoint areas of inefficiency and take timely corrective action to bring performance up to standard. Furthermore, with no costing system, management is unable to accurately estimate the costs of the various port services and the adequacy of available revenues to meet these various costs.

In an attempt both to gain an insight to the above problem and to develop a base for forecasting future expense, the Consultants have used 1978 figures in developing Tables B-4.4 and B-4.5. The first step in this process was identification of eleven cost centers - seven production centers plus four service centers. Fixed and variable expenses of each service center were allocated to the production centers.

Table B-4.4 develops variable costs per unit for each of the production centers. Both total fixed costs and variable costs per unit serve as bases for updating to the 1980 prices which are used in projecting the various expenses over the forecast period.

Table B-4.5 carries this process one step further by allocating the burdens of the service centers, by methods which reflect with reasonable accuracy the actual rates of utilization of these services, to the seven production centers. By so doing, it can be seen that total figures, the only numbers currently available to company management, are quite misleading. On a total weighted average basis, the company showed a profit of

Table B-4.4

LATTAKIA PORT COMPANY 1978 VARIABLE COSTS PER UNIT

Cost Center	Fixed Cost (SP 000)	Variable Cost (SP 000)	Total Cost (SP 000)	Output (Ships)	Variable Cost Per Unit (SP)
Pilotage & Towage	614	1,510	2,124	2,030	743.8
Anchorage & Berthing	229	461	690	2,030	227.1
				Tons (000)	
Loading-Unloading	3,486	9,696	13,182	1,783	5.4
Porterage	2,745	10,140	12,885	1,783	5.7
Storage	3,188	3,753	6,941	713	5.3
Silo	664	343	1,007	45	7.6
Cold Storage	291	171	462	4	41.1
Power Plan	947		947	na	na
Public Utilities	4,470		4,470	na	na
Maintenance Workshop	5,363		5,363	na	na
Administration	8,652		8,652	na	na
Total	30,649[1]	26,074	56,723[1]	na	na

Source: Company statements.

[1] Differs from total expenses shown in Table B-5.1 and B-5.2 by amount of inputed depreciation on fixed assets with zero book value.

Table B-4.5

LATTAKIA PORT COMPANY 1978 PROFIT/LOSS PER UNIT (SP)

Cost Center	Revenue Per Unit	Cost Per Unit	Profit/Loss Per Unit
Pilotage & Towage	750	1,382	-632
Anchorage & Berthing	392	432	-40
Loading & Unloading	12	10	2
Porterage	8	10	-2
Storage	47	18	29
Silo	16	40	-24
Cold Storage	82	278	-196
Average	41	32	9

Source: Company statements.

SP 9 per unit. But on a cost center basis, profit is seen to be generated only by the loading-unloading and storage operations, while offsetting losses existed in the other five production centers.

The port's accounting department must now elaborate the Consultants' first attempt into a full-fledged cost accounting system and integrate it into the present financial accounting system. It is recommended that this task be done in collaboration with a cost accounting consultant who would supervise the system's design and implementation.

B-4.3 INCENTIVE WAGES

One of the problem areas affecting productivity and throughput is that lack of incentives contribute to low cargo handling productivity, equipment shortages, and maintenance costs. As at least a partial solution to this problem, an incentive wage system has been authorized by Law No. 75 of 1 December 1979. The Consultants reviewed the provisions of this law and recommended that it be implemented promptly using the following principles as a basis for establishing the wage rates.

- The definition of persons covered by the incentive wage scheme should include equipment operators and supervisors as well as manual labor. Loading and unloading are team operations in which tractor drivers or crane and forklift operators are an integral part. They must be involved directly in the incentive wage plan if it is to succeed.

- The pay plan should be as simple as possible. The simpler the plan, the more clearly workers will see the connection between their productivity and their income, and administration will be simplified. Data on existing loading and unloading rates at Lattakia indicate that the range, in terms of tons per hour, varies greatly among commodities. This contrasts sharply with experience at other ports, where average tons per hour for general cargo range from 13 to 17, with five out of six categories of goods having loading rates of 15 to 17 tons per hour (see Table B-3.12 above). These differences can be better accomodated by equalizing assignments among the gang than by setting different wage rates for different types of cargo.

- The incentive rate should be substantial. It should provide an increase in income for the workers at present levels of productivity, provide an income competitive with private industry at a resonable level of increased productivity, and permit workers to earn even more by high production. The costs in wages are relatively minor compared to the economic savings in reduced demurrage and other hidden costs that will continue if port throughput is not substantially increased.

- The variances in rates based on the packaging of the cargo should be carefully set. If incentive rates set for pre-palletized or containerized cargo result in lower incomes than those for loose cargo, the workers will oppose these productive innovations as a threat to their income. Conversely, if they can see that they can handle more palletized cargo per hour and thus earn perhaps a little more money, they will support the shift to palletization and containerization.

B-4.4 PROJECTED PROFITABILITY AND FINANCIAL PLAN

Profitability

Revenues and expenses for the 5th Five-Year Plan, by year, and by plan period from 1981 to 2000 are shown in Tables B-4.6 and B-4.7. These projections have been based on the following assumptions:

- Revenues are in accordance with the proposed tariff structure discussed in Chapter A-4.

- Wages are assumed to have increased in proportion to the early 1980 Government-wide salary increase.

- Other variable unit costs are assumed to have increased by 15 percent by mid-1980.

- Fixed costs are increased at intervals appropriate to new investment and greater activity.

- Operations are forecast to levels consistent with forecast traffic and under conditions of increasing productivity resulting from implementation of the recommendations made in this report.

As expected, the new tariff rates increase revenue per ton from SP 39 to 1978 to SP 58 in 1981, and the higher costs raise expenses per ton from SP 30 in 1978 to SP 45 in 1981. But with revenues rising at a higher rate than expenses, profit per ton increases. As a result of these changes, revenues increase from SP 70 million in 1978 to SP 139 million in 1981, and profits before tax increase from SP 17 to SP 38 over this same period.

During the 5th Five-Year Plan, as shown in Table B-4.6, profits decline each year, primarily as a result of increasing depreciation as the expansion of the port is completed. This same phenomenon holds true for the period 1986-1990, but in the ensuing ten years profits rise as depreciation begins to decline and increasing amounts of containerized and palletized cargo result in more efficient operations.

Table B-4.6

LATTAKIA PORT COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981 - 1985

(SP Million)

	1981	1982	1983	1984	1985	Total
Revenues						
Vessel Charges						
Pilotage/Towage	5.5	5.7	5.8	5.9	6.1	29.0
Berthing	2.7	2.7	2.7	2.7	2.7	13.5
Mooring	0.6	0.4	0.3	0.2	-	1.5
Total Vessel Charges	8.8	8.8	8.8	8.8	8.8	44.0
Charges on Goods						
Loading/Unloading	116.0	119.4	122.9	126.3	129.7	614.4
Storage	4.5	4.6	4.6	4.7	4.8	23.1
Silo	1.7	1.5	1.2	1.0	0.7	6.0
Cold Storage	1.7	1.9	2.0	2.2	2.3	10.1
Total Charges on Goods	123.9	127.3	130.7	134.1	137.5	653.6
Other	6.7	6.9	7.1	7.2	7.4	35.3
Total Revenues	139.4	143.0	146.6	150.2	153.8	733.0
Operating Expenses						
Wages and Salaries	55.6	60.4	65.6	71.3	77.5	330.4
Maintenance and Repairs	6.6	6.8	7.0	7.1	7.3	34.8
Spare Parts	3.4	3.5	3.6	3.7	3.8	18.1
Fuel, Oil and Lubricants	1.6	1.6	1.7	1.7	1.8	8.3
Other	4.8	4.9	5.0	5.1	5.2	25.0
Total Operating Expenses	72.0	77.2	82.9	89.0	95.6	416.6
Operating Profit before Depreciation	67.4	65.8	63.7	61.2	58.2	316.4
Depreciation	16.3	20.6	27.8	32.8	37.9	135.4
Operating Profit	51.1	45.2	35.9	28.4	20.3	181.0
Other Expenses						
Administration	12.9	[illegible]	12.9	12.9	12.9	64.7
Interest	-	-	-	-	-	-
Total Other Expenses	12.9	12.9	12.9	12.9	12.9	64.7

Table B-4.6 (Continued)

LATTAKIA PORT COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981 - 1985

(SP Million)

	1981	1982	1983	1984	1985	Total
Profit before tax	38.2	32.2	23.0	15.5	7.4	116.3
Tax	25.1	21.2	15.1	10.1	4.8	76.3
Profit After Tax	13.1	11.0	7.9	5.4	2.6	40.0

Source: Consultants' estimates.

Table B-4.7

LATTAKIA PORT COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981 - 2000

(SP Million)

	1981-1985	1986-1990	1991-1995	1996-2000	Total
Revenues					
Vessel Charges					
Pilotage/Towage	29.0	35.2	43.3	51.3	158.7
Berthing	13.5	15.8	19.5	23.1	72.0
Mooring	1.5	-	-	-	1.5
Total Vessel Charges	44.0	51.0	62.7	74.4	232.2
Charges on Goods					
Loading/Unloading	614.4	735.6	880.5	1,025.4	3,255.8
Storage	23.1	25.8	28.9	32.1	109.9
Silo	6.0	5.1	7.8	10.4	29.3
Cold Storage	10.1	12.3	13.4	14.5	50.3
Total charges on Goods	653.6	778.7	930.6	1,082.4	3,445.4
Other	35.3	42.1	50.3	58.5	186.0
Total Revenues	733.0	871.8	1,043.5	1,215.3	3,863.6
Operating Expenses					
Wages and Salaries	330.4	434.8	505.4	565.1	1,885.7
Maintenance and Repairs	34.8	45.6	60.2	73.9	214.5
Spare Parts	18.1	22.0	27.0	32.0	99.1
Fuel, Oil and Lubricants	8.3	10.1	12.5	14.8	45.7
Other	25.0	30.4	37.4	44.3	137.2
Total Operating Expenses	416.6	542.9	642.4	730.2	2,332.2
Operating Profit before Depreciation	316.4	328.9	401.1	485.1	1,531.4
Depreciation	135.4	185.2	180.2	178.8	679.6
Operating Profit	181.0	143.7	220.9	306.3	851.9

Table B-4.7 (Continued)

LATTAKIA PORT COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981 - 2000

(SP Million)

	1981-1985	1986-1990	1991-1995	1996-2000	Total
Other Expenses					
Administration	64.7	71.2	77.6	84.1	297.5
Interest	-	-	-	-	-
Total Other Expenses	64.7	71.2	77.6	84.1	297.5
Profit before Tax	116.3	72.6	143.3	222.2	554.4
Tax	76.3	47.5	94.2	146.2	364.2
Profit after Tax	40.0	25.1	49.1	76.0	190.2

Source: Consultants' estimates.

Tables B-4.8 and B-4.9 show the port financial plan for the 5th Plan and 1981-2000. Table B-4.9 shows that profits after tax and depreciation charges are insufficient for meeting plan investments during the 5th Plan period. But these annual deficits become a surplus in the period 1986-1990. By the year 2000, cumulative internally generated funds are sufficient not only to meet all planned investment expenditures but to accumulate a surplus of SP 619 million.

As in the other modes, it must be pointed out that these calculations do not include availability of new foreign loans or repayments required on existing foreign loans which may have been earmarked specifically for port projects. Likewise, there is no interest charge made for any type of existing debt. The Consultants feel strongly that such items should be included in any proper analysis of this sort, but adequate data have not been made available. It is recommended that Syrian planners insert such information into the computer programs which generated these analyses, while updating and reviewing each of these programs as new developments occur and more refined information becomes available.

Table B-4.8

LATTAKIA PORT COMPANY

FINANCIAL PLAN 1981 - 1985

(SP Million)

	1981			1982			1983		
	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL
Capital Expenditures									
Investments									
Enlarge Lattakia Port	60.0	83.0	143.0	42.0	57.0	99.0	65.0	89.0	154.0
Equipment	7.4	-	7.4	7.3	-	7.3	3.9	-	3.9
Total Investments	67.4	83.0	150.4	49.3	57.0	106.3	68.9	89.0	157.9
Foreign Loan Repayments	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	67.4	83.0	150.4	49.3	57.0	106.3	68.9	89.0	157.9
Funds Available									
Internally Generated	16.5	25.8	42.3	17.9	49.1	67.0	19.5	75.3	94.8
Foreign Loans	-	-	-	-	-	-	-	-	-
Total Funds Available	16.5	25.8	42.3	17.9	49.1	67.0	19.5	75.3	94.8
Annual Excess/ Deficit	-50.9	-57.2	-108.1	-31.4	-7.9	-39.3	-49.4	-13.7	-63.1
Cumulative Excess/ Deficit	-50.9	-57.2	-108.1	-82.3	-65.1	-147.4	-128.7	-78.8	-210.5

Table B-4.8 (Continued)

LATTAKIA PORT COMPANY

FINANCIAL PLAN 1981 - 1985

(SP Million)

	1984			1985			TOTAL		
	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL
Capital Expenditures									
Investments									
Enlarge Lattakia Port	46.0	64.0	110.0	45.0	64.0	109.0	258.0	357.0	615.0
Equipment	3.9	-	3.9	3.9	-	3.9	26.4	-	26.4
Total Investment	49.9	64.0	113.9	48.9	64.0	112.9	284.4	357.0	641.4
Foreign Loan Repayments	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	49.9	64.0	113.9	48.9	64.0	112.9	284.4	357.0	641.4
Funds Available									
Internally Generated	21.2	101.2	122.4	23.2	30.2	53.4	98.3	281.6	379.9
Foreign Loans	-	-	-	-	-	-	-	-	-
Total Funds Available	21.2	101.2	122.4	23.2	30.2	53.4	98.3	281.6	379.9
Annual Excess/ Deficit	28.7	37.2	8.5	- 25.7	-33.8	- 59.5	-183.1	-75.4	-261.5
Cumulative Excess/ Deficit	-157.4	-41.6	-202.0	-183.1	-75.4	-261.5	-	-	-

Source: Consultants' estimates.

Note: FO.EX = Foreign Exchange
LO.CU = Local Currency

Table B-4.9

LATTAKIA PORT COMPANY

FINANCIAL PLAN 1981 - 2000

(SP Million)

	1981-1985			1986-1990			1991-1995			1996-2000			TOTAL		
	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL
Capital Expenditures															
Investments															
Enlarge Lattakia Port	258.0	357.0	615.0	-		-	-			-		-	258.0	357.0	615.0
Equipment	26.4	-	26.4	16.7		16.7	15.0		15.0	15.0		15.0	73.1		73.1
Total Investments	284.4	357.0	641.4	16.7		16.7	15.0		15.0	15.0		15.0	331.1	357.0	688.1
Foreign Loan Repayments	-	-	-	-		-	-		-	-		-	-	-	-
Total Capital Expenditures	284.4	357.0	641.4	16.7		16.7	15.0		15.0	15.0		15.0	331.1	357.0	688.1
Funds Available															
Internally Generated	98.3	281.6	379.9	132.4	149.0	281.4	163.1	143.9	307.0	199.1	139.7	338.8	592.9	714.2	1,307.1
Foreign Loans															
Total Funds Available	98.3	281.6	379.9	132.4	149.0	281.4	163.1	143.9	307.0	199.1	139.7	338.8	592.9	714.2	1,307.1
Excess/Deficit	-183.1	-75.4	-261.5	115.7	149.0	264.7	148.1	143.9	292.0	184.1	139.7	323.8	261.8	357.2	619.0
Cumulative Excess/ Deficit	183.1	75.4	-261.5	-67.4	73.6	3.2	80.7	217.5	295.2	264.8	357.2	619.0	-	-	-

Source: Consultants' estimates.

C

PART C

TARTOUS

CHAPTER C - 1

SUMMARY OF FINDINGS AND RECOMMENDATIONS

Chapter C-1

SUMMARY OF FINDINGS AND RECOMMENDATIONS

C-1.1 SUMMARY OF FINDINGS

The major finding with regard to the Port of Tartous is that, when the port is completed, and with achievable increases in productivity, it will have sufficient capacity to handle its share of forecast imports and exports and transit traffic through the year 2000. However, as with the Port of Lattakia, present and forecast container trends underline the importance of specialized container berths. A second container berth may be required as early as 1985. (See Chapter A-5, above.)

A complete inspection and physical survey was made of the existing port facilities, including warehouses, transit sheds, roadways, the electrical generating station, the workshop area, rail tracks, cargo-handling equipment, floating equipment, quay walls, fences and gates, quay cranes, phosphate silos, loading facilities and conveyors, refrigerated warehouses, and the uncompleted grain silos and Pier A transit sheds.

With the exception of the four small warehouses that formerly belonged to the Foreign Trade Zone, the physical condition of the port was found to be good.

Although considerable construction work remains to be accomplished, there are certain physical and operational advantages the port enjoys over Lattakia that preclude an effective comparison of productivity or efficiency of operations between the two ports.

These advantages are, generally, as follows:

- The more recent design of the port provides wide aprons between the ships and transit sheds, thus allowing ample space for cargo, vehicle roadways, and container handling with minimal interference.

- Port management displays a high degree of interest in improving operating efficiency.

- The mix of cargo is more uniform, providing greater ease of handling and higher productivity.

- Use of cubic space in the warehouses is generally good.

- The well-operated phosphate bulk-handling conveyor system accounts for approximately 1 million tons of total cargo handled.

- The frequent schedule of roll on/roll off vessels with their quick port turnaround and the rapid movement of vehicles in-transit through the wide port roads provides a substantial part of the total general cargo tonnage and generates little or no requirement for handling.

- A truck marshalling yard for roll on/roll off vessels outside the port gate eliminates much in-port vehicle congestion.

- Large open storage areas away from the immediate pier operations used for imported cars, containers, trucks, large crates, and structural steel removes these obstructive items from the pier operating areas.

- For the most part, cargo handling equipment is, with the present exception of container cranes, adequate to port requirements, relatively new, and in good condition.

- The equipment work shops, although not completed, are well designed and will be fully equipped.

The present operations are somewhat hampered by the following:

- Construction taking place in every section of the port is causing interruptions in cargo handling and vehicle movement.

- Dirt from construction, and particularly the serious problem of dust from the phosphate pier, are an irritant to the workers, a major cause of high vehicle and machinery maintenance, and a hinderance to operations.

- A large portion of the labor force is untrained in both cargo handling and equipment operation.

- First-line supervision on the piers and ship unloading operations could be improved.

- Labor, equipment, and surface transport scheduling to the work areas are not fully coordinated, resulting in a high loss of manpower labor hours.

- Truck scheduling and shortages are delaying the loading and unloading operations.

- At present, spare parts and equipment in the workshops are in short supply.

- Rail construction to the port has not been completed.

- The lumber yard area is in complete disorder. Broken steel bands and lumber in a jumble are causing truck loading in this area unnecessary delays. The condition of the yard is a safety hazard for people working in this area and is a potential area for a major fire.

- Rodent control is non-existent.

- Efforts to clean the port are hampered by the lack of equipment and a vigorous work force.

- Mobile cargo handling equipment that is no longer operable is not disposed of, resulting in cluttering and poor usage of the equipment storage yard.

- Top management department heads and their immediate subordinates are relatively inexperienced in port operations.

C-1.2 RECOMMENDATIONS

Phosphate Pier

Immediate improvements are recommended to contain the dust from the phosphate conveyor and ship loading systems. Details are contained in Chapter A-3; they have been reviewed with the phosphate facility management. It is assumed that the labor and engineering required to accomplish the work will be performed by the port staff. Material costs are estimated to be SP 80,000 purchased on the local market. Equipment costs for additional dust collectors are estimated at SP 600,000 at 1979 prices, resulting in a total expenditure of SP 680,000. Annual maintenance and repair to the phosphate mechanical system due to dust is estimated to have been SP 1,200,000 in 1979; containment of the dust would provide substantial additional savings.

The building used for receiving the trucked phosphate should be equipped with truck-rail car body vibrators to hasten the unloading operation.

Port Cleaning

A road sweeping machine, similar to the recently acquired city machine, should be purchased immediately and used extensively throughout the port on a daily basis to alleviate the dirt and dust problem.

One of the three new mobile tow bar sea suction pumpers acquired by the Fire Department should be assigned to the Cleaning Section and used for washing down the roadways and quay aprons at night after vessel loading activities have

stopped. As an additional precaution against fires, the Fire Department could assist the Cleaning Section in this endeavor.

In addition to the road sweeping machine and mobile water pumper with hose, two warehouse type sweepers should be purchased and used for cleaning the warehouse and transit sheds.

The Cleaning Section Chief should discuss rodent control methods with his counterpart in Lattakia, where this problem has been brought under control, and a definite program of rodent control should be instituted.

Pier A quay aprons should be scraped and thoroughly cleaned.

Port Operations

The port should acquire 20,000 pallets as soon as possible for cargo movements from ship through the transit sheds and to the truck loading dock. The pallets should be used to reduce manhandling of cargo, which will release additional labor to alleviate the present shortage in the labor pool.

The port should establish an office of Rail Coordinator within the Office of Exploitation to work with the railroad. The early establishment of such an office will be beneficial in the long term as rail movements become a major transporter of bulk cargoes to and from the grain and phosphate facilities.

When the new main gate and associated roads are completed, consideration should be given to using the present gate for expedited roll on/ roll off truck movements through the port.

Port equipment operators should participate in the incentive productivity pay for cargo handling enjoyed by the other cargo handling workers. (A similar recommendation has been made for the Port of Lattakia.)

Hand hooks used in the movement of cargo are helpful tools but should be used only on those cargoes that they will not damage.

The handling of lumber piece by piece to trucks should be stopped. Lumber should be handled in prestrapped units in order to have an efficient operation.

Specifications for imported lumber should call for unitized strapped bundles of uniform lengths.

The port should expedite the delivery of two mobile container cranes with automatic lifting spreader attachments. These units will greatly increase ship to quay handling productivity, with annual savings of $45,000 or more.

Floating Equipment

The 10-year-old tow boats are showing signs of wear from being used constantly. Because of high replacement costs for these vessels, a careful evaluation should be made of their condition before a replacement program is begun. Most often, extensive hull repairs and engine replacements can extend boat life for a considerable time at a cost less than replacement.

Roll on/Roll off Truck Service

A direct approach from the roll on/roll off berth at Pier B will cause less port truck congestion. This alignment can be accomplished by relocating warehouses 4 and 5 from a north-south position to an east-west orientation in the adjacent open space.

Fences, Gates, and Port Security

Vehicles using the Southern Gate that require security inspection or instructions for the driver should be allowed to move inside the gate to an off-the-road area so as not to block the gate entrance.

Portable barriers should be used at the Main Gate to keep the trucks in line. This will relieve much of the present congestion and will also allow for a quick adjustment to the variable use of either of the gates for heavy incoming or outgoing traffic.

Quay Bulkheads

When the tubular rubber fenders on Pier A are replaced, they should be made uniform with the larger diameter fenders used on the phosphate pier. The larger units will give better protection to the structures.

Fire Department

One of the three mobile tow pump machines, with extra hose, should be permanently located adjacent to the lumber yard. This unit should be checked daily to ensure proper operation.

The Fire Department should be provided with a Land Rover-type personnel carrier and fitted with a tow bar for the mobile tow pumping machines.

Electric Generator Power Supply

The generator coil windings should be cleaned and a Megger test of the insulation resistance made. Heating elements should be used on the windings when the units are not operating.

Grain Terminal Silos

After a review of the Port General Arrangement Plan, it was not clear as to how the railway wagons loading or unloading at the silos would be switched for a return to the marshalling yard. This operation and design layout should be reviewed.

C-1.3 ESTIMATED EQUIPMENT REQUIREMENTS

Table C-1.1 shows estimated equipment requirements and costs for 1980, 1985, and 2000. Between 1980 and 1985 the major remaining construction of the port should be completed. During this period equipment requirements for the new facilities are expected to be large.

Review of the port's design plan and list of required equipment indicates that certain criteria have either been over- or under-stated.

With the trend to increasing movements of roll on/roll off and container ship cargoes entering the port, the need for pallets and fork trucks will over a period of time decline. Therefore, the design estimates of 228 fork lifts in the 2 to 4.5 ton range is felt to be overstated, as are 166 pallet trucks, 194 trailers of 5 ton capacity, and the 98 tractors.

For the above reasons, these earlier design estimates have been reduced. Replacing this equipment will be the need for additional container fork trucks with automatic lifting spreader attachments. The design plan list calls for two rubber-tired gantry container cranes and two rail container cranes of 40 tons capacity each. This number will be insufficient for the planned three container berths, where a total of six container cranes will be required.

It must be assumed that there will be a transition period between the now predominant break-bulk cargo handling and the build up of full container terminal utilization. In preparing the estimated major equipment requirement list and costs, the Consultants have considered this period of time.

As the next five years will be critical in providing for the expanding facilities, equipment requirements should be kept under review and lead times for suppliers rechecked.

Table C-1.1

ESTIMATED EQUIPMENT REQUIREMENTS AND COSTS-PORT OF TARTOUS

(1979 prices)

Equipment by Type	1980			1985			2000		
	No.on Hand	Add. Req'd	Cost (000 SP)	No.on Hand	Add. Req'd	Cost (000 SP)	No.on Hand	Add. Req'd	Cost (000 SP)
Mobile Cranes 6-12 ton capacity	9	2	320	11	2	160	5	5	800
Mobile Cranes 5 & 20 ton capacity	39	0	-	39	0	-	10	15	3,900
Mobile Container Crane & Auto Lifting Spreader	0	2	2,800	2	2	2,800	4	2	2,800
Tow Trucks	0	2	120	2	0	-	0	2	120
Road Paving Roller	0	1	80	1	0	-	1	0	-
Yard Trailers for Containers	0	10	600	10	40	2,400	40	20	1,200
Tractor for Container Trailers	2	4	160	6	8	320	8	15	600
Industrial Farm Type Tractor	55	0	-	50	0	-	0	10	520
Yard Trailers 5 ton capacity	78	0	-	50	0	-	0	20	800
Wood Pallets 160 x 120 cm	0	20,000	1,600	18,000	0	-	10,000	0	-
Fork Trucks 2 ton capacity	21	10	1,400	21	20	2,800	10	10	1,400

Table C-1.1 (Continued)

ESTIMATED EQUIPMENT REQUIREMENTS AND COSTS-PORT OF TARTOUS

(1979 prices)

Equipment by Type	1980 No.on Hand	1980 Add. Req'd	1980 Cost (000 SP)	1985 No.on Hand	1985 Add. Req'd	1985 Cost (000 SP)	2000 No.on Hand	2000 Add. Req'd	2000 Cost (000 SP)
Container Fork Truck & Auto Lifting Spreader	2	0	-	2	2	2,800	2	6	8,400
Tow Boats 85-300 HP	5	0	-	5	0	-	0	5	-
Tug Boats 300-1,000 HP	1	1	1,200	2	0	-	3	1	1,200
Pilot Boats	2	0	-	2	0	-	2	1	500
Street Sweeping Machine	0	1	35	1	0	-	0	2	70
Warehouse Sweeping Machine	0	2	40	2	0	-	0	2	40
Yard Mobile, Equipment Service Truck	0	1	140	1	0	-	0	1	-
Yard Fuel Truck for Mobile Equipment	0	1	40	1	0	-	0		40
Total			8,535			11,280			22,390

Source: Consultants' estimates.

Note: Number of additional equipment required is based on estimated life and additional equipment required.

CHAPTER C-2

ORGANIZATION

Chapter C-2

ORGANIZATION

C-2.1 THE PRESENT ORGANIZATION

The de facto organization is structured in accordance with the Legislative Decrees that created the Tartous Port Company and the approved de jure organization that has been in force since March 1977. The deviations in the organization center around the extent of performance, staffing, and accomplishment of some of the functions. For example, the Studies Directorate essentially does not exist. It currently is staffed with one Director, who is also the Deputy General Director.

The civil engineering functions are currently divided. The Major Projects Agency is charged with the task of preparing plans for the construction and expansion of the port. The Civil Engineering Directorate is responsible for supervising construction and accepting completed projects.

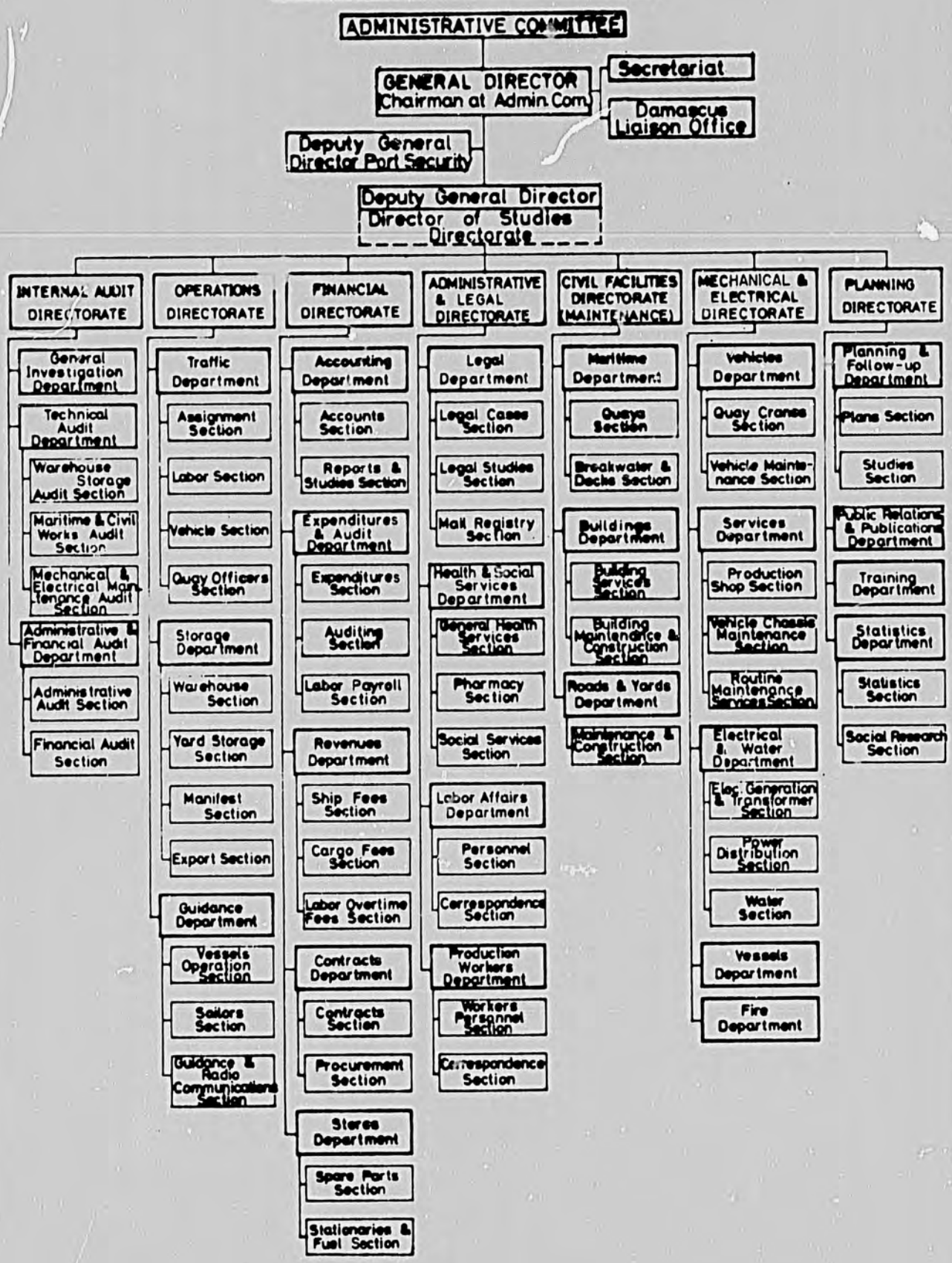
The present organization, shown in Figure C-2-1, is organized under a six member Administrative Committee. The members of the committee are the General Director as Chairman; the Directors of the Operations, Planning, and Civil Engineering Directorates, and two labor representatives.

The General Director is the Chief Executive Officer, appointed to the position on the recommendation of the Minister of Transport. He has two Deputy General Directors. The one who is nominally Director of the non-functioning Studies Directorate coordinates the activities of the directorates, undertakes special studies, and assumes the General Director's responsibilities in his absence. The other Deputy General Director is in charge of Port Security, which enforces safety regulations, protects the premises against vandalism and outside unauthorized encroachment, and safeguards the employees.

Under the de facto organization, the title and level of position is not necessarily indicative of the authority and influence that an individual has within the organization. The Deputy General Director, who has the responsibility for coordinating the activities of the directorates, does exercise some authority in making decisions and resolving routine operating problems that may occur. However, he is restricted in exercising authority, is not a member of the Administrative Committee, and does not get involved or is limited in his involvement in: the employment of personnel; transfer of personnel between directorates; procurement; and contacts with Government organizations and other agencies. Obviously, under the current organization of the Administrative Committee, the Deputy

FIGURE C-2-1

PRESENT ORGANIZATION TARTOUS PORT COMPANY



General Director would have some difficulties in exercising authority over the directors who are members of the committee. This potential form of over-ride influence tends to negate his effectiveness as Deputy General Director.

Essentially, he is an assistant to the General Director, acting in accordance with his instructions, rather than having clearly delineated duties and responsibilities and the authority to exercise them.

The Administrative and Legal Directorate has a personnel complement of 52. It is responsible for legal affairs; personnel screening, evaluation, record keeping, and counseling; medical services and social welfare and benefits programs; and central typing, mail, and copying services. As part of the company's administrative services, the directorate should also be assigned the responsibilities for procurement, the storing of administrative supplies, and central telecommunications.

The Operations Directorate, the production/revenue producing activity of the port, employs upward of 1,400 permanent employees. The organization is responsible for the scheduling and berthing of ships, for loading, and unloading transportation, and for storage of cargo. The maritime operations are assigned to the Guidance Department, the stevedoring activities are scheduled and controlled through the Traffic Department, and the porterage and warehousing functions are assigned to the Storage Department. The Storage Department maintains records of inventory and verifies and records all manifests. The Quay Officers Section of the Traffic Department provides supervision over the activities on the docks although the workers are directly supervised by foremen appointed from the workers cooperatives. To be effective, foremen should be recognized as part of management and not members of the workers' cooperatives. They are in effect and should be first line representatives of management working directly for a Quay Officer (Dock Supervisor). The Vehicles Section within the Traffic Department is responsible for scheduling and dispatching vehicles, mobile equipment, and operators to the worksites in support of the Labor Section's work schedule. This function of scheduling equipment and drivers was recently transferred from a Technical Follow-up Section within the Mechanical and Electrical Directorate to the Operations Directorate, where it more appropriately belongs. This change eliminates the Technical Follow-up Section.

At the Tartous Port the pier used for exporting phosphates, the grain storage silos, and the cold storage warehouse are not staffed or operated by the port company. The port company maintains the facilities, but the daily operations are under the control of the Government organizations that are responsible for phosphate shipments, grain imports and exports,

and the transportation and distribution of food products that require refrigeration.

The Internal Audit Directorate is charged with the function of overseeing the effectiveness and efficiency of the port operations and reporting the findings to the concerned directors and/or the General Director. In accordance with the directives establishing the organization, the Internal Audit Directorate was assigned a wide range of auditing, investigative, and production analysis functions.

The extensive functions assigned to the Internal Audit Directorate are in conflict with some of the functions that are or should be the responsibility of other units within the organization. To accomplish the defined activities of the directorate would require a considerable staff of talented people possessing knowledge in a broad range of disciplines including engineering, finance, accounting, mechanics, maritime operations, warehousing, and legal investigation. People with these talents would be more constructively employed if they were engaged in applying their knowledge and skills in the development of improved methods, systems, procedures, and related controls. Currently, to the general benefit of the organization, the Internal Audit Directorate has only five employees including the Director, who is also the head of the port's labor union. Primarily, these employees investigate accidents and a range of other problems assigned to them by the General Director.

The organization would not be warranted if the functions that are desirable and required were assigned to appropriate units within the organization and if proper systems and procedures existed. The auditing of financial and accounting records as well as the auditing of inventory, including the periodic taking of physical inventories, should be functions of the Expenditures and Audit Department under the Finance Director. With proper time keeping and payroll procedures coupled with the periodic audits conducted by the Expenditures and Audit Department, any discrepencies in workers' attendance should routinely be identified. Operations analysis for the benefit of improving productivity and throughput of cargo should be the responsibility of the appropriate department in the Planning Directorate. Complying with laws and regulations should be part of the routine responsibilities of all management representatives and key administrative employees. They should be aware of the latest statutes, rules, and regulations applicable to their operations and should inform their employees. Additionally, systems and procedures should be developed to incorporate the checks and balances needed to assure compliance. The investigation of illegal activities and law violations should be either turned over to outside authorities or, when necessary, undertaken by the Port Security Office. The current

prime activity of the Internal Audit Directorate is investigating accidents. This should become a function of a recommended Safety Unit assigned to the Planning Directorate.

The Financial Directorate includes five departments employing 100 staff members. The departments are: Expenditures and Audit. Accounting; Revenues; Stores; Contracts and Warehouse.

The Contracts Department, within its Contracts Section, prepares and maintains records on all tenders to be called and all contracts to be issued. The Section also processes and follows up on the issuance of import licenses and requests for letters of credit. Under the Procurement Section, arrangements are made for the purchase of all supplies required by the company.

The purchasing function should be assigned to the Administrative and Legal Affairs Director. The Consultants consider that it is inappropriate to have the activity of making commitments of expenditures under the jurisdiction of the executive who is responsible not only for the controlling revenue, funds, and expenses but also for auditing, verifying, and making payments.

The Stores Department, whose activities also should be assigned to the Administrative and Legal Affairs Director, is responsible for maintaining the inventory records and operating the warehouses and storage facilities for all parts, equipment, material, administrative supplies, and fuel required in the daily operations at the port. Again, it is inappropriate to have the executive who is responsible for maintaining, auditing, and validating inventory and asset accounting records to also be responsible for the actual storage and distribution of these assets. Such an arrangement sets up possible conflicts of interest and negates proper checks and controls.

The Expenditures and Audit Department, comprising Audit, Expenditure, and Labor Payroll sections, should be split, and an Audit Department should be expanded to cover a broader range of auditing functions, some of which are currently designated as part of the responsibilities of the Internal Audit Directorate. The Expenditures Section, responsible for all expenditures (except payroll) and for budget compilation and analysis, should be dispersed and the functions reassigned. Expenditures, or accounts payable, as a logical extension of accounting, should be assigned to the Accounting Department, as should the Labor Payroll Section. The important functions of budgeting and related analyses should be set up as an independent Budget and Financial Studies Department.

The Revenues Department is, as the name implies, the accounts receivable unit of the organization and as such is responsible for verifying manifests and for the collection of all ship,

cargo, and overtime labor fees that are charged to shippers, agents, and brokers. Although accounts receivable is often a responsibility of an accounting department, it is not inappropriate, considering the emphasis placed on and the importance of revenue collection to the port company, to set up this activity as a separate department.

The Accounting Department maintains the general ledgers and all other pertinent books of accounts; issues monthly, annual, and other required fiscal reports; and undertakes studies and projects requested by the Administrative Committee and the General Director. It should, as mentioned above, be assigned the responsibility for expenditures (accounts payable) and labor payroll.

A vital function that should be a responsibility of the Financial Director but is currently not recognized as an activity is cost accounting. A cost accounting unit should be set up within the Finance Directorate to enable the development and compilation of functional costs applicable to specific operations.

In addition to supervising construction, the Civil Facilities Directorate is charged with the maintenance of all buildings, grounds, roads, quays, and marine structures. The directorate employs approximately seventy employees, who are assigned to three departments: Roads and Yards; Buildings; and Maritime Facilities. The organization is so staffed and equipped that it does undertake minor construction and reconstruction projects as needed. Although the organization is adequately staffed to accomplish its assigned functions, it does have some problems in acquiring and keeping sufficient numbers of skilled experienced personnel.

The Mechanical and Electrical Directorate is responsible for the maintenance and technical services required to keep all vehicles, equipment, utilities, and vessels in operation. In addition, it is responsible for fire prevention and fire fighting. The functions have been logically assigned to five departments: Fire; Vessels; Electrical and Water; Services; and Vehicles. The directorate employs 125 permanent employees, most of whom are skilled, including engineers, mechanics, electricians, and metal workers. Similar to the Civil Facilities Directorate the mechanical and electrical organization has a chronic need for additional skilled, experienced personnel.

The Planning Directorate consists of three departments: Planning and Follow-up; Statistics; and Public Relations and Publications. In the de jure organization, it is chartered to have a training department, which in fact does not exist.

The directorate, with only 13 employees, is seriously understaffed, not only in the number of personnel but, more important, in the skills required to effectively accomplish the functions delegated.

The Public Relations, and Publications Department has only one employee, who is engaged in arranging and scheduling tours of the port and preparing and publishing of informational brochures and promotion material. These functions are important, but they are not planning functions. As established and defined, the organization should be reporting to an administrative affairs executive.

Within the Planning and Follow-up Department, the Plans Section is responsible for preparing: projects for inclusion in annual and five-year investment plans; the annual financial plan and foreign exchange currency plan; yearly production plans; and manpower projections. The Studies Section of this department collects regulations and tariffs applied at other ports, makes comparative studies, and compiles informational reports on these findings. With only a department head and a clerk making up the staff of the Planning and Follow-up Department, there are severe limitations on the extent to which plans are developed and studies undertaken. As a result, no feasibility studies or cost benefit analyses are undertaken. The plans that are prepared are developed from a compilation of whatever data are readily available and/or can be extracted from other managers. The department endeavors to accomplish the tasks assigned and to perform the functions designated as responsibilities, but the value that could be realized cannot be attained without having an adequate number of trained, qualified personnel and consistent, reliable sources of data.

The Statistics Department employs eight people, who are engaged in compiling statistical data and preparing reports on production, vessels using the port, types and volume of cargo, energy and fuel consumption, workers' salaries and qualifications, retirement plans, social security benefits, productivity, and other statistics requested by management.

The Planning Directorate, which can be vitally important in planning for growth and improvement in the operations of the port as well as contribute to improved methods systems, procedures, and controls, needs to be reorganized and strengthened.

The Tartous Port Company organization follows the pattern in other Government-owned transportation companies. The organization centers around the Director General, who alone makes all significant decisions, delegating only limited authority to the management staff for making routine decisions pertinent to

daily operations. The Administrative Committee, an internal committee controlled by the General Director, does, within the authority granted it through the legislative decrees, establish policy. The committee will consider problems presented by the General Director that require a decision. Such problems are presented at the discretion of the General Director, usually when he deems it desirable to share the responsibility. There is an apparent reluctance to delegate authority and relinquish control of the decision-making process, and subordinate management is reticent to assume responsibility for making decisions. In part, this can be attributed to:

- a shortage in knowledgeable personnel possessing administrative skills,

- a lack of depth in the number of people trained and experienced in port operations to the extent that confidence in decision making is developed,

- a fear of jeopardizing one's position and job security,

- management's limited control over employees

- the fear of retribution resulting from the outcome of decisions,

- the intense political environment which engenders attempts at survival through avoidance of decision making, and

- the potential of arbitrary application of the Economic Sanction Law, which deals with all acts that impair and harm operations of production, distribution, and exchange.

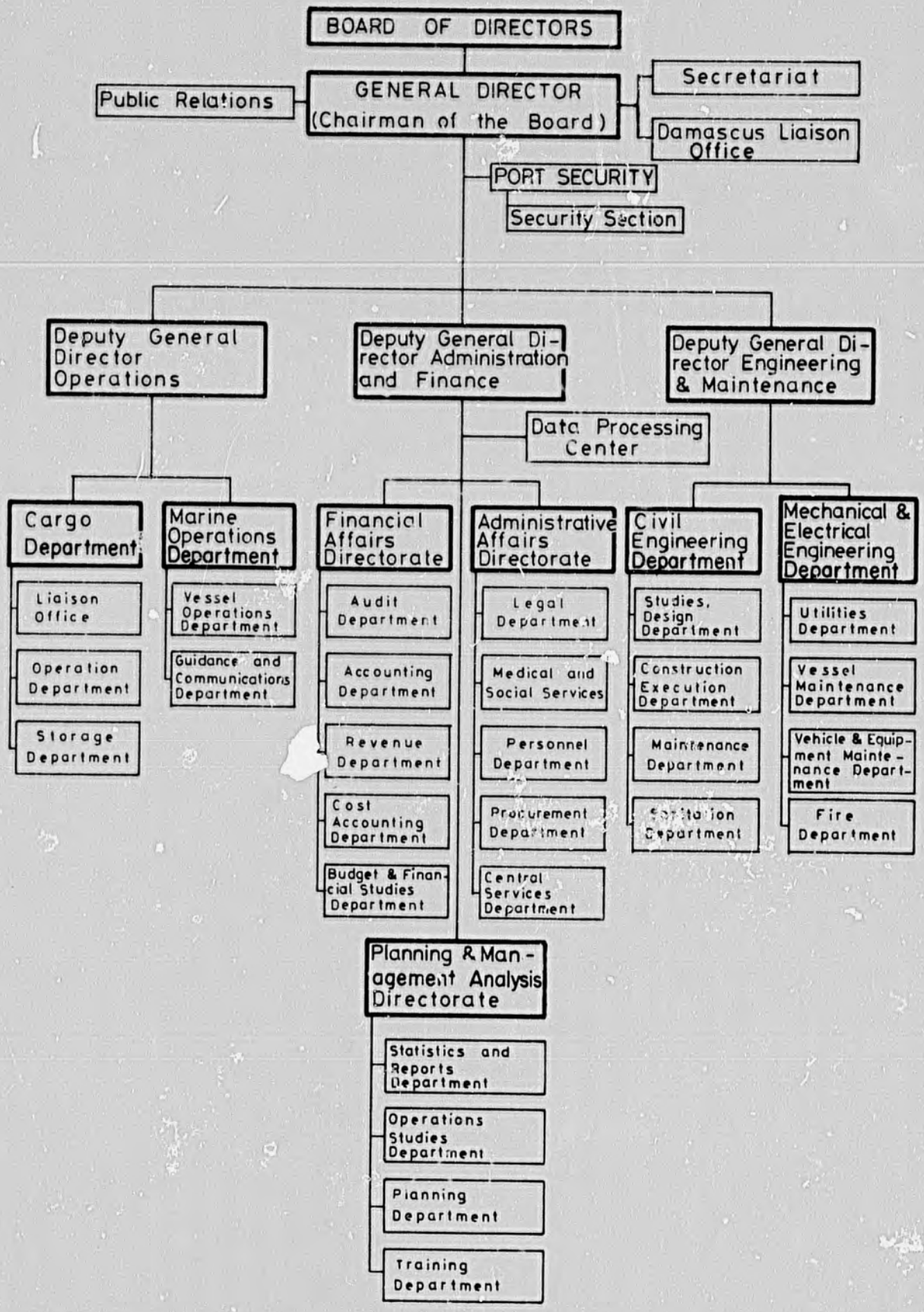
C-2.2 RECOMMENDATIONS FOR REORGANIZATION

The organization recommended by the Consultants for the Tartous Port Company is shown in Figure C-2-2. The recommended structure is essentially the same as that recommended for the Lattakia Port Company, for the reasons discussed in Section B-2.2, Chapter B-2 above. The only differences are minor ones, resulting from differences in operations - e.g., passengers at Lattakia.

To strengthen the organization at the upper level of management it is recommended that three Deputy General Director positions be established with clearly defined direct lines of responsibilities and delegated authority, commensurate with the positions.

FIGURE C-2-2

PROPOSED ORGANIZATION TARTOUS PORT COMPANY



The three positions are:

- Deputy General Director for Operations
- Deputy General Director for Administration and Finance
- Deputy General Director for Engineering and Maintenance.

The three Deputy General Directors should be members of a Board of Directors. It is recommended that the Administrative Committee be changed to a Board of Directors and that the members include outside company representatives that can provide external knowledge, experience, and direction in formulating policies and making major management decisions. A representative of the Ministry of Transport should be a member of the Board. Membership on the board should also include some representation from such agencies as Customs and the Shipping Agencies Company that have an interlocking interest in effective port operations.

The present Administrative Committee, as legislated in Decree No. 18, is an internal management committee controlled by the General Director. It provides no forum for invaluable outside knowledge and experience that can contribute significantly toward the improvement of policies, operations, and controls.

An internal management committee can meet as often as necessary to resolve operating problems, but major policy subjects and questions that have an impact on the company, such as the five year and annual plans, financial plans, major operation or organization changes, and the periodic financial and operation reports,should be presented to a broader representation of interests and experience.

C-2.3 ALTERNATIVE ORGANIZATION

As is the case in Lattakia, an alternative to the Consultants' proposed organization would be to establish a single Deputy General Director position and create five directorates, reporting through him to the General Director. The five directorates would be:

- an Operations Directorate, subdivided into Cargo and Marine Operations Departments,

- a Financial Affairs Directorate, as proposed,

- an Administrative Affairs Directorate, as proposed,

- a Planning and Management Analysis Directorate, as proposed, and

- an Engineering and Maintenance Directorate, subdivided into Civil Engineering, and Mechanical and Electrical Engineering Departments.

This alternative would require the Deputy General Director to be in the line of command, making decisions for the General Director and thus reducing the amount of work that would go to him. It would have the advantage of elevating the directorates to a higher level in the organization, and it would be less change from the present.

The main disadvantage would be the increased amount and level of work going to the General Director and the Deputy, and the fact that the five directorates are relatively unbalanced in size and importance. Because of this, the Consultants favor the recommended organization with three deputies, but it is not an absolutely clear choice. The difference between these alternatives is less important than the consolidation of functions within the directorates that is recommended in Section B-2.2.

CHAPTEF. C - 3

INFRASTRUCTURE AND OPERATIONS

Chapter C-3

INFRASTRUCTURE AND OPERATIONS

C-3.1 INTRODUCTION

In contrast to the present Port of Lattakia, the planning for the Port of Tartous occurred at a time when the trend to container and roll on/roll off ships, larger road trucks, and unitized cargo and the need for specialized ship terminals had become apparent. These trends were taken into consideration in the planning of the port. As a result, adequate road widths, quay aprons, and rail facilities have been provided. Specialized terminals are under construction for the roll on/roll off and container ships, with provision also made for the continuing use of conventional general cargo and bulk vessels. The port's initial expansion plans have been and continue to be revised as further study is made of future ship facility requirements.

C-3.2 BRIEF HISTORY OF THE PORT

Construction of the Port of Tartous, located at the site of an ancient Roman port, started in 1960 with the building of the breakwaters and was completed in 1966. In 1966, limited operation of vessel handling had begun, and in 1968, a separate pier was placed in operation for the handling of bulk phosphate.

With the port's excellent geographical location, the movement of both bulk and general cargo continues to expand. The number of ships serving the port since it was opened has risen from 166 in 1969 to 1,722 in 1978. It is estimated that total port development is now some 40 percent complete.

Since heavy construction is currently being carried out in all sections of the port, ship loading and unloading and vehicular movement and construction often interfere with one another. This temporary setback of operations will be almost completely eliminated when the grain silos and the transit sheds on Pier A are completed in the near future and when rail service to the phosphate-loading silos is initiated.

C-3.3 DESCRIPTION OF THE EXISTING PORT

General

The port is located on the northern coast of Syria at Latitude 34°53' North and Longitude 35°43' East.

Port facilities are protected by an extensive breakwater, whose total length is 4,270 meters.

The 200 meter wide entrance channel, with a planned depth of 14.5 meters and leading to a turning basin diameter of 450 meters, is expected to be adequate to meet future ship-handling requirements.

There will be three separate piers (Piers A, B, and C) when the planned port construction is completed. These piers will be equipped with distinctive general cargo-handling facilities, an enlarged phosphate bulk handling facility, a possible sulfur quay, and two shipyard repair facilities, one for harbor vessels and one for ocean-going ships (see Table C-3.1).

Because of the incomplete construction of the port, the operational area that handles general vessel cargo loading and discharging is presently restricted to the north and south side of Pier A and to the phosphate pier and adjoining wharf separating these two facilities.

Additional vessel berthing is provided by buoy moorings within the sheltered harbor along the breakwater. These moorings allow lighter operations for 12 ships (see Plate C-3.1).

C-3.4 PHOSPHATE PIER

When the phosphate pier was designed, aneffective dust-gathering system was installed throughout the silos and conveyor system. At that time, the phosphate contained a relatively high degree of moisture to which foreign buyers objected. As a result, a drying facility was installed at the site of the mine. Although this process is beneficial to the sale of Syrian phosphate, the port's vacuum dust-gathering system is now unable to cope with the excessive dust problem caused by the drying process.

Because of prevailing southwest winds and because the phosphate pier is located at the southern end of the port, the phosphate dust blows across the entire port. When the wind changes to a southeasterly direction, the dust contaminates a nearby hospital.

The phosphate dust is also causing problems in the refrigerated warehouse and in the power station machinery. The GM of the phosphate facility estimates the added cost of maintenance to the phosphate-handling equipment because of the dust is approximately SP 1 per ton handled. The facility is expected to have handled 1.2 million tons in 1979, expanding to its full capability of 3 million tons over the next few years. Phosphate dust creates, and will continue to create, a serious

Table C-3.1

INVENTORY OF PIER FACILITIES - PORT OF TARTOUS

	Pier A	Phosphate Pier	Pier B	Pier C
Structure Type and Size	160 meters wide 800 meters long-north 770 meters long-south 11 berths of varying size. Interlocking concrete block bulkheads	270 meters long Interlocking Concrete block bulkheads	200 meters wide 540 meters long-north 890 meters long-south Interlocking concrete block bulkheads	156 meters wide 610 meters long-south Interlocking concrete block bulkheads
Used For	General cargo and roll on/roll off. Grain imports and exports in future	Phosphate and general cargo	General cargo and roll on/roll off	Container vessels (north side used by military)
Years of Construction	1966 - 1968	1966 - 1968	Under construction	South side not constructed yet
Present Condition	Excellent but needs stringers on bulkhead edges	Excellent but needs dust control system	NA	NA
Estimated Remaining Life	50 years	40 years	NA	NA
Depth of Water at Quay	540 meters of 4 meter depth 130 meters of 7 meter depth 300 meters of 8 meter depth 170 meters of 9 meter depth 360 meters of 10.5 meter depth 240 meters of 12 meter depth	11 meters	Not known	NA

Sources: Port records and visual inspection.
Note: NA = Not applicable.

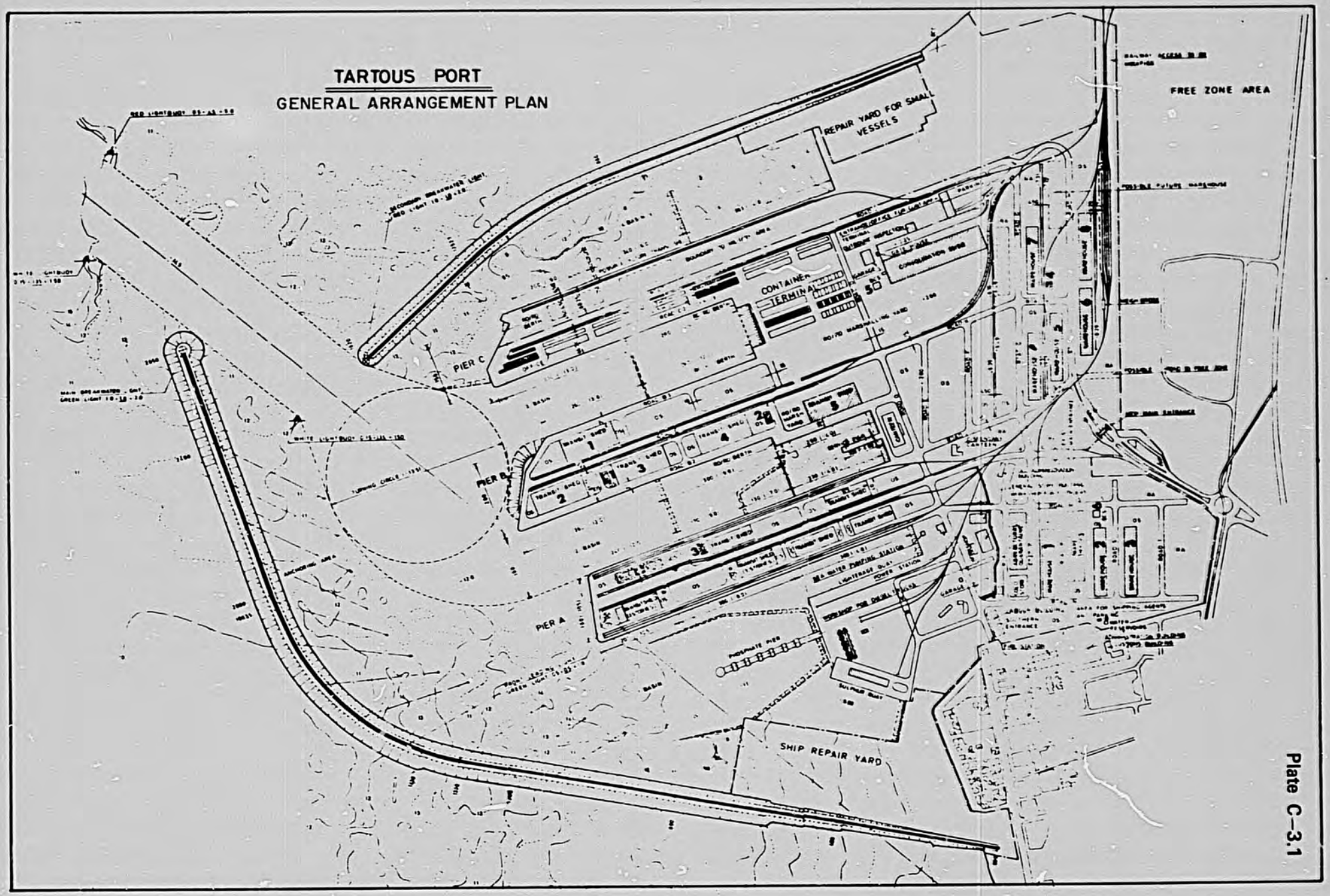

TARTOUS PORT
GENERAL ARRANGEMENT PLAN
REPAIR YARD FOR SMALL VESSELS
FREE ZONE AREA
CONTAINER TERMINAL
PIER C
PIER B
PIER A
SHIP REPAIR YARD

Plate C-3.1

equipment maintenance problem as well as health problems throughout the port. Excluding the dust problem, the phosphate-handling equipment is managed and operated efficiently.

Phosphate dust is blown into the air at three places in the delivery system - trucks dumping into the grates, phosphate moving along the conveyor, and discharge into the ships' hatches.

Losses in Dumping

Trucks enter the facility through large open doors, proceed to the floor grates and dump their cargo, and continue straight out through the exit doors. The dumping raises a substantial cloud of dust, and the wind going through the open entrance and exit doors causes a wind tunnel effect, pulling the dust out of the building. To prevent this, curtains should be installed over the two sets of doors. They must be kept closed at all times except when a vehicle is actually entering or leaving.

While there are many curtain doors on the market for dust control, the simplest method requiring the least time and expense would be to erect a horizontal steel track over the top of each door from which a heavy canvas or tarpaulin is suspended on small wheels connected to a cable driven over pulleys by a reversible motor drive. The outside edges should be fastened securely to the wall to prevent billowing, with a substantial overlap in the center.

It must be reemphasized that these curtains should be closed at all times except when the trucks are actually moving in or out. At the least, the entry or exit curtain should be closed even if another truck is waiting.

When railway delivery of phosphate begins, the same system of door curtains can be used. Since the curtains would be loose fitting, they would effectively enclose a railway car that is stopped in the doorway, leaving open only the area under the car.

Examination of the interior of the premises revealed that the present cyclone dust collectors were not functioning. Hand tests for suction under each cyclone showed no movement of air. On the second visit, one cyclone was operating. The others were under repair or awaiting parts. The cyclone that was working was merely taking the phosphate powder up to the roof and letting it blow away.

The Port Engineering Department should perform a study to determine the most suitable type of dust collector to be installed in conjunction with the existing cyclones. Principal criteria should be cost, effectiveness in meeting desired air quality standards, and ability to obtain reusable material.

In addition, the present collectors should be immediately overhauled and made operable with constant cleaning and maintenance. Because of the potential health hazard, the use of goggles and masks should be stringently enforced on the workers in the dumping area.

Conveyor Losses

Visual inspection of the corrugated sheeting and windows of the structure covering the external conveyor system showed torn sections, broken glass, and leaks between sheets. These should be repaired as quickly as possible by the maintenance staff to protect the integrity of the system. Phosphate dust is being sucked through these openings, contributing to the pollution.

A major source of product loss and pollution is the phosphate blown off of the open feeding joint from the boom and the overhead conveyor from along the partially open conveyor on the boom, and from open sections or rips in the loading sleeve. To correct this, a plastic fabricated sleeve or tube should be installed, connected to the overhead conveyor by a flexible cover with a bellows or flexible joint. This should increase the security of the product and stop most of the loss.

Loading Losses

The free fall of phosphate into a ship necessarily creates a cloud of powder within the hold of the vessel. The winds across the hatch suck powder from the cloud and substantially aggravate the pollution from dust. The recommended method of preventing this is to install a large tarpaulin, supported by a beam on each side of the loading boom, that would act as a flexible hatch cover or tent to enclose the entire hatch. At most, this would require the effort of one or two men to adjust the cover over the hold and make it secure from billowing, using ropes to the deck. As each hold is filled, the entire cover could be carried by the boom assembly to the next hold.

Summary

The recommendations presented here would reduce greatly the environmental pollution in the port. The costs should not exceed SP 95,000 for the covers and repairs. Additional dust collectors, depending on the type selected, would cost an estimated SP 750,000. This total cost of SP 845,000 compares very favorably with the GM's estimate of approximately SP 1,200,000 in additional maintenance costs due to dust in the phosphate facility alone. These costs would not be eliminated, but they would be reduced, and as noted above, there would be substantial tangible and intangible (i.e., health) savings elsewhere in the port.

C-3.5 FIRE DEPARTMENT

The three fire trucks and pumping machines are completely equipped and maintained in good operating condition. However, there is no vehicle available for towing the three mobile pump machines. The fire tow bar is located too high for a connection to be made to them.

C-3.6 EQUIPMENT

Lighters

The port employs 14 lighters of approximately 150-ton capacity each for handling cargo from moored vessels. Considering the ample availability of lighter space and the number of daily vessels waiting to be discharged, the lighter fleet should probably be expanded. A review of the number of vessels tied to moorings indicates that some are moored for repairs while some use the mooring only for safe anchorage.

A study of the recorded vessels at moorings for cargo handling purposes over a one-year period would indicate how often the moorings are used for cargo handling. Based on a simple multiplication, each mooring for cargo handling should require four lighters. Two of the lighters for each vessel would be in service at the quay and two would serve the vessel.

As expansion continues, the number of lighters required will be reduced. However, the present stage of development indicates that the demand for lighterage will continue until port construction is completed. To meet this need, the possibility of borrowing lighters from Lattakia should be explored.

Tow Boats and Tugs

The 10-year-old tow boats are beginning to show the wear of constant usage. Because of high replacement costs, it is recommended that a careful evaluation of their condition be made before a replacement program is started. Most often, extensive hull repairs and engine replacement can be made, thus extending the boat life for a considerable period of time at a cost considerably less than building a replacement.

Floating Cranes

Table C-3.2 includes present equipment by type, year purchased, estimated life, and remarks on condition.

C-3.7 ANALYSIS OF THE PLAN FOR TARTOUS PORT EXPANSION

The plans and criteria for the expanding port project are reviewed and analyzed in this section.

Table C-3.2

INVENTORY OF EXISTING FLOATING AND MOBILE EQUIPMENT - PORT OF TARTOUS

Item	On Hand	Operational	Type or Capacity	Year of Purchase	Estimated Life (years)	Remarks
Dump Trucks	8	7	6 ton	1968	2	-
	12	12	10 ton	1977	9	-
	10	10	8 ton	1975	6	-
	10	10	10 ton	1975	6	-
	3	0	Small diesel	NA	0	Should be disposed of
Fork Trucks	20	0	3 ton	1970	0	Should be disposed of
	15	14	3 ton	1977	8	-
	7	7	6 ton	1977	8	-
	1	0	2 ton	1970	0	Should be disposed of
	1	0	3 ton	1970	0	Should be disposed of
	1	1	1 ton	1970	6	Seldom required
	2	2	32 ton container	1977	8	-
Mobile Cranes	1	0	6 ton	1968	0	Should be disposed of
	1	0	16 ton	1968	0	Should be disposed of
	10	0	12 ton	1972	2	-
	10	10	15 ton	1975	6	-
	20	17	15 ton	1976	7	1 to be disposed of
	12	12	25 ton	1977	8	-
	3	0	NA	1969	0	Should be disposed of
Portal Cranes	4	4	3 ton	1967	11	-
	4	4	3 ton	1972	13	-
	8	8	6 ton	1972	13	-
	4	4	6 ton	1979	10	-

Table C-3.2 (Continued)

INVENTORY OF EXISTING FLOATING AND MOBILE EQUIPMENT - PORT OF TARTOUS

Item	On Hand	Operational	Type or Capacity	Year of Purchase	Estimated Life (years)	Remarks
Tractors	10	5	-	1973	4	Could not identify
	10	NA	-	1973	4	-
	25	NA	-	1977	8	By manufacture Most not seen
	10	NA	-	1975	6	-
Trailers	78	NA	-	NA	NA	Various conditions of repair and disrepair
Lighters	14	14	150 ton Open deck	Approx. 1968	10	-
Tow Boats	2	2	300 HP	1969	10	May require extensive repairs
	1	1	100 HP	1969	10	May require extensive repairs soon
	2	2	300 HP Estimate	1975	15	One unit may require overhaul
	1	1	500 HP	1976	16	-
Floating Cranes	1	1	Hungary, 100 ton Lift-Jawhara	1971	15	Good condition
	1	1	Lift, 32 ton	1976 Estimate	15	Good condition

Table C-3.2 (Continued)

INVENTORY OF EXISTING FLOATING AND MOBILE EQUIPMENT - PORT OF TARTOUS

Item	On Hand	Operational	Type or Capacity	Year of Purchase	Estimated Life (years)	Remarks
Fire Trucks	1	1	Modern, fully equipped	1971	10	Excellent condition
	1	1	Modern, fully equipped	1975	15	Excellent condition
	1	1	Modern, fully equipped	1979	20	Excellent condition
	3	3	Mobile Tow bar.sea water suction pumpers	1979	15	Excellent condition

Source: Port records and Consultants' inspections.

Note: NA = Not available.

Upon completion of construction, the Port of Tartous will reflect the excellence of the planning criteria that led to its design. The initial design has undergone a number of changes in response to continuing changes in maritime technology. It is recommended that this review of plans continue throughout all further stages of construction.

Planning Considerations

In line with world trends in port design, the expanding port is developing outside the populated city center. Rail and road access to and from the port will connect to a new highway under construction and a rail terminal that will route traffic away from the city center. The location of the port, north of the city, satisfies criteria for improved environmental and recreational aspects of the city waterfront promenade and beaches.

As the port continues to expand, a notable growth in city population is taking place. Upon completion of this expansion, Tartous will be a major Syrian city. When this occurs, the preserved waterfront land will become increasingly valuable economically and the area will be popular as a recreational and social center.

The plan for three separate marine terminals, each designed to meet the present and future requirements of specialized ships, is excellent.

The mix of vessel types that can be expected to serve Syrian cargo over the next 20 years ranges from large bulk carriers, container vessels, traditional general cargo break-bulk ships, and combination container break-bulk ships, to lumber ships and small coastal vessels.

The matching of terminal equipment, transit sheds, warehouses, water depths at the berths, and open storage space to meet the cargo handling and efficiency of each vessel type should improve productivity, thereby reducing costly vessel delays.

As planned, Pier A is to be used primarily for older vessels of the traditional general cargo break-bulk type and for the grain terminal. Supporting transit sheds have been provided for temporary storage. Railway lines that extend along both quays and between the transit sheds will provide either direct or indirect car delivery. Ample roadway has been included for two-way traffic and truck parking. Open space between the buildings is sufficient for the storage of steel or containers.

The grain facility with direct rail connections has ample water depth and berth length.

Pier B is to be used for modern, highly efficient ships specializing in cargoes, heavy lifts, and unitized cargo. Provision has been made at this terminal for roll on/roll off vessels on the south and north end of the pier.

Pier C is designed as a container-handling facility with gantry cranes for efficient loading and unloading. It will provide open storage space and will be served by excellent road and rail systems.

Warehouses

Under revised design criteria, a number of warehouses have been eliminated and more open space has been provided in the newer plans.

Because trends in packing cargo into more uniform sizes, pre-palletizing, and unit loading both bagged and boxed cargo are continuing, and because the present mix of cargo by type may not remain constant, it is possible that open storage needs and warehouse requirements will undergo some changes in the future.

Port statistics reflecting the need for such changes should be made available to the Office of Major Projects. As these changes occur, they will influence modified designs of the facilities not yet constructed.

Sulfur Pier

A study is now underway to develop a special quay in the southern section of the port for the export of new sulfur. This material consists of very fine particles in a free-flowing condition and is a by-product of the oil refineries at Homs and Banias.

In addition to posing a potential health hazard, sulfur in this form represents a serious fire hazard.

The proposed location of the sulfur quay is adjacent to the phosphate pier and is exposed to the same prevailing winds that sweep across the port.

Because of the potential hazards that sulfur presents to port personnel and operations, it is recommended that alternative sites be considered for handling this cargo.

Ship Repair Yards

The location of the two ship repair facilities at opposite ends of the port will reduce flexibility in exchanging skilled manpower and equipment from one yard to the other. Traditionally, ship repair operations show a series of intensive work

activities followed by slack periods. The present plan should be reviewed to consider combining the activities of the two yards.

New Main Gate

Given an estimated 634,000 vehicles per year in transit through the port once construction is completed, the retention of the present main gate in addition to the planned new gate and roadway is also advisable. As located, the present main gate would not interfere with other port plans if it were retained.

Future Container Vessels

The trend toward increased use of containers at the Syrian ports is expected to continue. The smaller, full container vessels employed by such companies as the Mini-Line are now using the port. The employment of the medium-size container vessels is expected to develop first as a feeder system from larger ports in the Mediterranean that will accommodate the large mother ship.

As the Syrian economy and industrial expansion develop, the large container ships will become more economically justifiable to serve Syrian ports directly.

Future Roll on/Roll off Vessels

The development of roll on/roll off vessels was greatly accelerated by the lack of port facilities in the Arabian Gulf. These vessels can be loaded and unloaded quickly with relatively modest facilities. As the ports in the Gulf continue to develop, the use of roll on/roll off ships is declining. For example, the use of container vessels with a capacity of 200 containers as opposed to the capacity of 60 trucks for the same size roll on/roll off vessel, is more efficient and economically justifiable. It can be expected that the use of these vessels, except for short sea routes, will decline.

Under this assumption, the three planned roll on/roll off berths will be more than sufficient to meet the future port's requirements.

It is recommended that the port's statistical department provide continuous details about the roll on/roll off operations to the Office of Major Projects for purposes of possible modifications to the present plan.

Roll on/Roll off Truck Road Alignment

The roadway provided for trucks will require two 90° turns to reach the new main gate. The concentration of this traffic,

with 80 to 90 trucks leaving or entering the port at any given time, will effectively close off this area to all other activities. Therefore, a direct approach to Road H (the main road) would cause less port congestion. This can be accomplished by relocating warehouses 4 and 5 from a north-south position to an east-west orientation in the adjacent open space. The present location of these buildings would then become the open storage areas. The road from the roll on/roll off berth would then pass between these buildings and directly connect with Road H, the main road (see Plate C-3.2, Note 1).

This plan also shows a minor recommended change to Road L that connects the container terminal with Road H. The way in which the dogleg is now designed has been done more for aesthetic value than for utilization. Expected heavy traffic on this segment of the road would best be served if the tangent of the road was long and the radius of the curve was great. (See Plate C-3.2, Note 1.)

C-3.8 PRODUCTIVITY

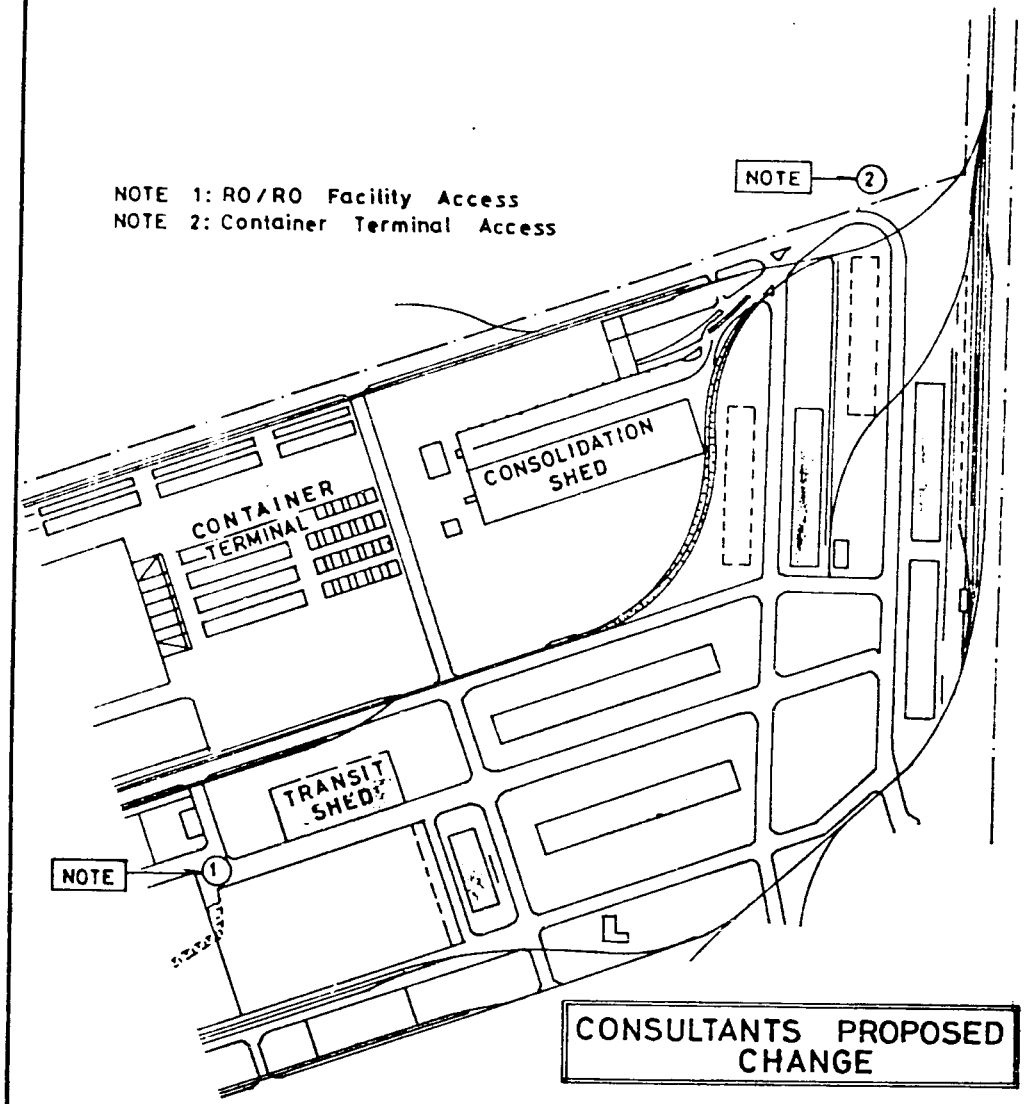
Productivity Rates

The productivity norms by type of cargo at a multi-purpose terminal per working shift, as determined by a United Nations study, are shown in Table C-3.3.

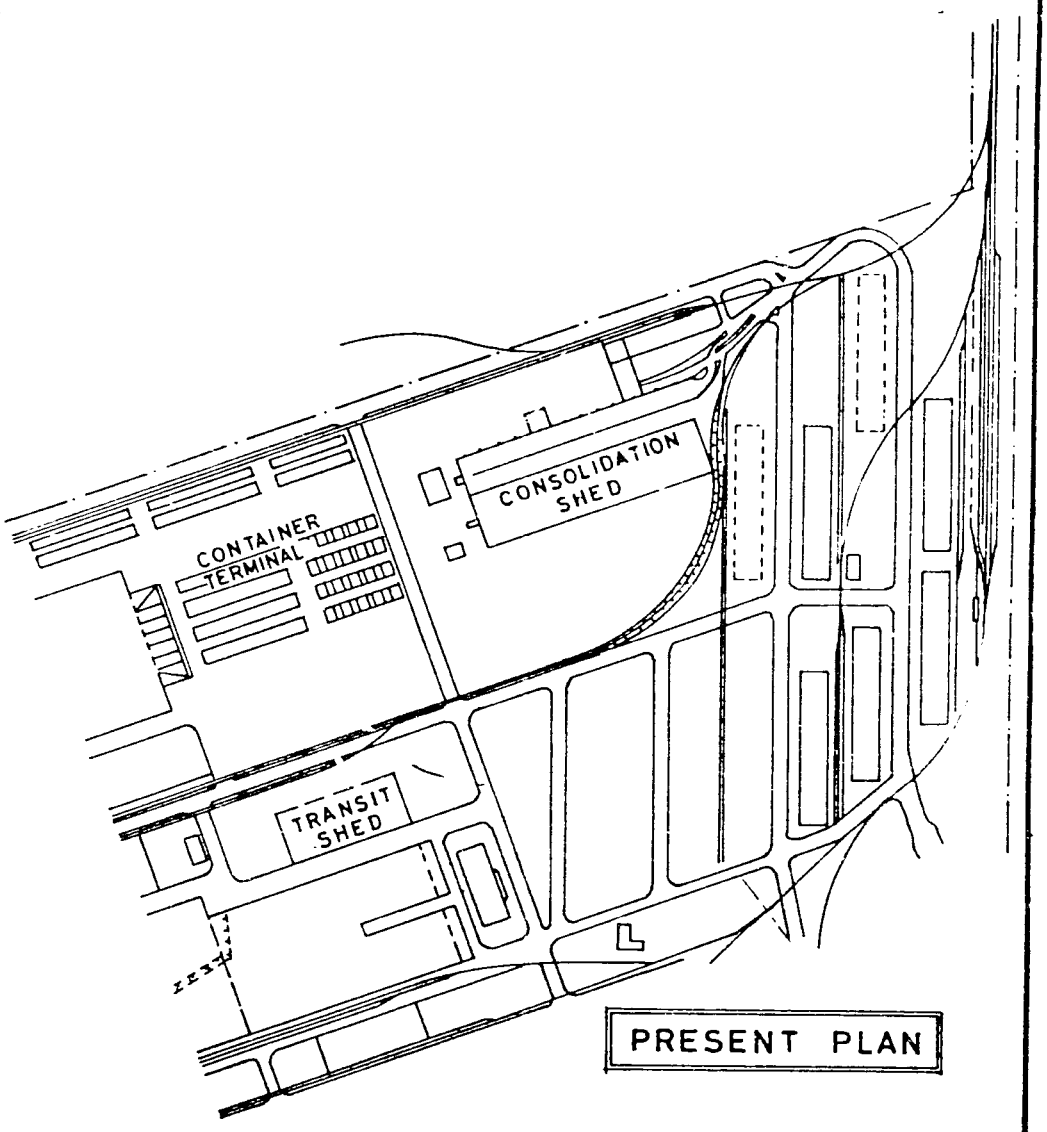
The generally acceptable daily rate of discharge per shift from a mix of general cargo ships per vessel berth at a multi-purpose terminal is 750 to 800 tons. The estimated daily rate of discharge per berth in Tartous is 500 tons (i.e., about 350 tons per shift per berth). This is based on the port having the equivalent of 12 vessel berths, including roll on/roll off and lighterage. The operating days per year at the port are given as 350. 500 tons/berth x 350 working days x 12 berths = 2,100,000 tons. This is comparatively close to the actual total general cargo handled in 1978 of 2,117,000 tons. In 1979, the rate is estimated to have increased to about 730 tons per berth per day, influenced by roll on/roll off traffic and, to a lesser extent, containers. The Consultants estimate that, in 1979, over 500,000 tons (about 15 percent of general cargo) was roll on/roll off or containerized.

A comparison of these average rates with those of Tartous Port is shown in Table C-3.4.

A minimal obtainable goal of 750/tons/vessel/berth/day should become a port operating objective. Such a goal would raise the present annual port capability for handling general cargo to 3,150,000 tons, an increase of over 1 million tons/year.



CONSULTANTS PROPOSED CHANGE



PRESENT PLAN

TARTOUS PORT

PLATE C-3.2

Table C-3.3

AVERAGE PORT PRODUCTIVITY RATES BY TYPE OF CARGO

Type of Cargo	Rate (tons/berth/day/shift)
Conventional General Cargo Palletized on Port Pallets	400
Bundled Lumber	900
Bundled Iron and Steel Products	1,100
Pre-palletized Cargo	500
Roll on/Roll off	1,500
Containers	1,500
Preslung Cargoes (e.g., cement)	500

Source: UNCTAD Port Performance Indicators, United Nations Publications, Sales Number E76.11.0.7.

Table C-3.4

TARTOUS PORT - AVERAGE TONS UNLOADED PER DAY, SHIP LOADS, & WAITING DAYS BY COMMODITIES

(July 1979)

Commodity	No. Ships	Number Days Waiting Berth	Number Days Working	Total Tons Unloaded	Average Tons Per Day Working	Average Tons Per Ship	Average Waiting Days Per Ship
Cement							
Less than 1000 tons	23	34	30	16,450	548	715	1.5
Over 1000 tons	5	33	52	38,312	737	7,662	6.6
Wood							
Less than 1000 tons	7	13	34	3,535	104	505	1.9
Over 1000 tons	9	138	112	26,340	235	2,927	15.3
Fertilizer	1	3	24	10,424	434	10,424	3.0
Sugar	2	75	46	32,053	697	16,026	37.5
Rice	2	44	28	17,268	617	8,634	22.0
Barley (Bulk)	1	10	28	26,250	938	26,250	10.0
Flour	7	43	35	21,392	611	3,056	6.1
Iron	9	122	49	25,610	523	2,846	13.6
Equipment	4	36	14	3,654	261	914	9.0
Foodstuff	2	3	7	961	137	481	1.5
Paper	1	30	9	1,399	155	1,399	30.0
Marble	3	7	10	2,354	235	785	2.3
Miscellaneous	14	134	77	17,752	230	1,268	10.3

Source: Compiled from Tartous Port Company data.

The following unloading rates are based on direct observations:

- Lumber Direct to Trucks: Crane cycle time per load ranged from five to eight minutes depending mainly on condition of bundle, configuration of the truck, availability of truck for immediate loading, and stowage of lumber in either broken or unbroken bundles.

- Cement: Crane cycle time, eight minutes. This should be four minutes. Delays were caused by hand stacking in the truck. Preslung unitizing slings used and left with the cargo would solve this problem.

- Ammonia Nitrate: Crane cycle time ranged from twelve minutes to four minutes. Cycle time should have been maintained at four minutes. Delays were caused by broken bags caused by chocker slings and poor handling, hand stacking in the truck, men in the hold of the ship not keeping up with the truck because chocker slings were not available, and inexperienced ship winch operators.

Factors Affecting Productivity

Vessel unloading is often maintained, over various lengths of time, at most acceptable rates. It is the many interruptions to normal operations that bring down the average discharge rate during a working shift. These interruptions are caused primarily by the following:

- Using chocker slings when pallets should be employed.

- Truck or equipment operators leaving their vehicles unattended.

- Truck shortages or poor scheduling.

- Roadways and quay aprons blocked or narrowed by either truck parking or cargo left in the way of vehicle traffic.

- Broken preunitized loads requiring piece by piece handling, resulting in ship or shore crane cycle delays.

- Floating cranes used to discharge containers.

- Manhandling cargo piece by piece into transit sheds and using hand trucks at a rate slower than the crane.

- The equipment operators do not participate along with the workers in receiving the incentive or productivity extra pay allowances. This tends to affect the cooperation required

between the equipment operators and the workers in striving for the best possible productivity.

Productivity Potential

Production rates can be expected to increase considerably and should meet the acceptable averages when the following conditions are met:

- Two mobile container-handling cranes with automatic spreader are delivered and placed into operation.

- The majority of bagged cargo i.e., cement flour, and sugar, arrives preslung or palletized.

- The Pier B roll on/roll off ship dock is completed and placed in full operation.

- Port pallets are acquired and used for nonpalletized general cargo from the ships through the transit shed and onto the truck or rail loading dock.

- Packaged lumber is handled by prestrapped bundled units instead of piece by piece.

- Supervision of labor is improved and personnel are trained and gain more operating experience.

- The port is cleaned and the phosphate dust problem is solved.

- The rail track is completed and operating.

- Equipment operators take the extra care to stack cargo in the storage areas properly.

C-3.9 RAIL SERVICE

Although construction of the rail lines to the port is not completed, limited service was resumed in December 1979. Inspection of rail operations in the port in January 1980 indicated that the limited service was being well utilized.

If rail wagon loading and port operations are not properly controlled and coordinated with scheduled, prompt movement of cars in and out of the port, rail wagons left in the port will be an obstruction to other operations. When the grain silos are placed in operation and rail service to the phosphate pier is completed, the high number of rail wagons entering the port will intensify this potential problem.

The number, type, and movement of rail wagons should be scheduled, and this information should be in the hands of the Exploitation Department prior to its daily planning meetings. The magnitude of future rail wagon service required by the port suggests that an office of rail wagon coordinator in the Exploitation Department should be established by the Chemin de fer Syrian to work with the port. An early start in establishing in-port rail regulations and guidelines for operation will be beneficial in the long run.

C-3.10 CONTAINER HANDLING

One container is generally handled by the port's floating crane every 10 to 15 minutes depending on location of the crane. If the crane is located between the quay and the ship, the cycle tends to be less than when the crane is positioned outboard of the vessel. The location of the floating crane should depend on the number of containers to be handled. For one to ten containers, the time required to reposition the ship outboard of the crane is not warranted.

Ten minutes is the average time required for containers handled in the open storage area by fork truck with an automatic spreader lifting device. Delays are caused by parked trucks, which crowd space, operating aisles narrowed or narrow by too many container stacks.

When the port acquires shore mobile container cranes with automatic lifter spreaders, the movement of containers from ship to truck should be 25 per hour, with a potential savings in vessel time costs of $45,000.

C-3.11 PORT HOUSEKEEPING

Port Cleaning

In contrast to the very clean Port of Lattakia, the Port of Tartous is exceptionally dirty.

Port cleaning is greatly hampered by the large accumulation of phosphate dust, cement powder from construction, broken bags in the unloading operation, and dirt from building excavation. In addition to these problems, the lack of present toilet facilities is causing sanitation problems.

There is also a considerable amount of trash that should be picked up and disposed of. Lumber that can be suitably used for blocking, for shoring under heavy crates to facilitate the placing of crane slings or the entrance of the forks of a forklift, and for separation in stacking iron and steel structural members should be salvaged and neatly stacked in a special area.

The quay apron (particularly the north side of Pier A) has a large build-up of sugar, cement, truck and automotive oils, flour, and fertilizer that renders it difficult to walk through the area. This material must be scraped up before additional cleaning is undertaken. A water/chemical solvent spray on the pier applied by a tank truck may expedite this effort.

In addition to these problems, the water drainage system is clogged with waste material.

Compounding these problems is the lack of any program to keep the port facilities clean. For the most part, this is a reflection of limited manpower and the physical inability of many of the 30-member cleaning staff to perform hard work.

With new facilities operational, the port company should acquire proper cleaning equipment, such as large power sweepers for cleaning the roads, small power sweepers for the paved yards, and storage building hoses for washing down the quays. The facilities are too large to be kept clean and neat on a continuing basis with brooms, although there will still remain the need for manual sweeping in some areas. To do an effective cleaning of the roads and quays, the sweepers will have to operate at night, when cargo handling has been completed for the day.

Rodent Control

The Consultants observed that many ships do not have rat guards on their mooring lines at the quay. Rat guards attached to the mooring lines keep rats from going on or off the ship. Rodent control is always a problem in a port because of the types of materials and foodstuffs stored. Besides the damage they do to the cargo, they are a health problem for the port workers. The rodent problem in Tartous is particularly serious, while in the Port of Lattakia it has been effectively controlled. The Cleaning Section Department supervisor should discuss the control methods with his counterpart in Lattakia.

CHAPTER C-4

FINANCE

Chapter C-4

FINANCE

C-4.1 HISTORICAL EVALUATION

Construction of the port is still underway under the supervision of the Major Projects Administration (MPA), an agency of the Ministry of Public Works and Water Resources. As a result, the costs of structures, facilities, and equipment have not been finally determined. The MPA keeps records of the annual investment expenditures on the port and has aggregated them by type of contract through 1974, but it has not made the cost of structures, facilities, and equipment available to the port. As a result, the port company has not been able to prepare any balance sheets. The port company does not keep any asset or liability accounts, and the capital of the company is still undetermined. The only accounts that the port company keeps are revenue and expense accounts.

Thus, financial analysis of the Tartous Port Company must be limited to studying the basic operating and financial parameters and the structure of revenues and cost.

Table C-4.1 shows that as tonnage throughput fluctuated from 1970 to 1978, revenue per ton also fluctuated quite widely, from SP 14 per ton in 1973 to SP 30 in 1975, and to SP 31 in 1976. As a result of the same presidential decree cited in Chapter B-4, revenues per ton then increased to SP 27 in 1978. Fluctuations in expenses per ton and profit per ton are equally wide.

Because of the difference in traffic between Tartous and Lattakia, comparisons of revenues per ton are not valid between these two ports. Likewise, in the absence of depreciation figures for Tartous, and because of the different ages, design, and efficiencies of the two ports, detailed comparison of expenses and profits per ton between these two ports must be treated with caution. It could be noted, however, that 1978 wages and salaries at Tartous as shown in Table C-4.2 average only 45 percent of total revenues at Tartous as compared with 48 percent at Lattakia - an expected result of the newer port's modern design and efficiencies. Also as in Lattakia, the trend of profitability has been generally downward since 1974 as rising costs have overtaken the 1974 tariff increase.

C-4.2 ACCOUNTING SYSTEM

As noted above, there is a complete absence of balance sheet accounting at Tartous. Thus, the port company has no cash,

Table C-4.1

TARTOUS PORT COMPANY OPERATING AND FINANCIAL INDICATORS

Year	Number of Ships	Tonnage[1] (000)	Revenues (SP 000)	Expenses (SP 000)	Profit Before Tax (SP 000)
1970	129	460	NA	NA	NA
1971	187	705	NA	NA	NA
1972	223	558	NA	NA	NA
1973	395	636	8,718	3,906	4,812
1974	609	1,036	24,168	6,210	17,958
1975	1,138	1,486	43,804	11,741	32,063
1976	1,646	2,121	56,948	24,369	32,579
1977	1,438	2,508	65,270	30,733	34,537
1978	1,611	2,415	57,731	30,215	27,516

Sources: Statistical Bulletin and Company statements.

Note: NA = Not Applicable.

[1] Excludes phosphate.

Table C-4.2

TARTOUS PORT COMPANY REVENUES AND EXPENSES
(SP 000)

	1974	1975	1976	1977	1978
REVENUES					
Vessel Charges	598	1,059	1,557	1,805	1,478
Charges on Goods	20,803	35,530	46,487	50,111	48,176
Other	2,767	7,215	8,904	13,354	8,077
Total Revenues	24,168	43,804	56,948	65,270	57,731
OPERATING EXPENSES					
Wages & Salaries	5,307	7,108	19,901	26,675	25,872
Maintenance & Repairs	515		1,693	2,563	2,628
Fuels, Oil & Lubricants				494	535
Total	5,822	7,108	21,594	29,732	29,035
Operating Profit Before Depreciation	18,346	36,696	35,354	35,538	28,696
Depreciation					
OPERATING PROFIT	18,346	36,696	35,354	35,538	28,696
Administration	388	4,633	2,775	1,001	1,180
PROFIT BEFORE TAX	17,958	32,063	32,579	34,537	27,516

Source: Company statements.

inventory, receivable, payable, accrual, fixed asset, or depreciation accounts. Furthermore, the capital of the Port company is still undetermined. In theory, the port company has a backlog of at least 15 balance sheets to prepare, but it is doubtful that this is worth the effort. It would be better to construct a 1979 balance sheet using the available asset data from the MPA and then attempt to make current balance sheets each year thereafter, as recommended below.

Another shortcoming is the lack of an appropriate financial accounting system, procedures, and forms, with which proper, up-to-date accounting records might be kept. Finally, no cost accounting system exists.

For the same reasons, and according to the same methods applicable to Lattakia, the Consultants have taken preliminary steps in identifying costs at Tartous. This study has been prepared in the absence of balance sheets; the only financial statements the port company issues are those for revenues and expenses.

This lack of data created a problem in terms of identifying the depreciation expense of fixed assets. This problem was overcome by estimating the fixed asset values and applying the Port of Lattakia depreciation rates. To estimate the fixed asset values, annual actual expenditures for the structures, equipment, and vehicles of the Tartous Port were obtained from the MPA for the years 1975-1978. These expenditures were aggregated by type of asset for each year and then for the period. The MPA had previously prepared an aggregate actual expenditure table, by type of asset, from the beginning of construction of the port until 1974. By adding the total expenditures on each type asset for the two periods, an estimate of the value of the various type assets of the Tartous Port was obtained.

Table C-4.3 develops variable costs per unit for each of the five production centers. The port has a phosphate silo and a cold storage operation; however, they are under the jurisdiction of other public enterprises, the General Phosphate Company and the General Consumption Organization, and thus have not been included among the port's cost centers.

Table C-4.4 allocates service center fixed costs to the various production centers in proportion to their estimated utilization of services. By doing so, the overall profit of SP 8 per unit is seen to be composed of profitable anchorage and berthing, loading and unloading, and storage centers, a breakdown porterage center, and an unprofitable pilotage and towage operation.

Table C 4.3

TARTOUS PORT COMPANY 1978 VARIABLE COSTS PER UNIT

Cost Center	Fixed Cost (SP 000)	Variable Cost (SP 000)	Total Cost (SP 000)	Output (Ships)	Variable Cost Per Unit (SP)
Pilotage & Towage	888	524	1,412	1,721	304.5
Anchorage & Berthing	541	72	613	1,712	41.8
				Tons (000)	
Loading-Unloading	3,593	7,878	11,471	2,177	3.6
Porterage	2,173	9,206	11,379	2,177	4.2
Storage	651	1,038	1,689	330	3.2
Power Plant	449		449	na	na
Public Utilities	2,282		2,282	na	na
Maintenance Workshop	4,992		4,992	na	na
Administration	6,142		6,142	na	na
Total	21,711[1]	18,718	40,429[1]	na	na

Source: Company Statements

[1] Differs from total expenses shown in Tables C-5.1 and C-5.2 by amount of imputed depreciation.

Table C-4.4

TARTOUS PORT COMPANY 1978 PROFIT/LOSS PER UNIT

(SP)

Cost Center	Revenue Per Unit	Cost Per Unit	Profit/Loss Per Unit
Pilotage & Towage	1,285	1,489	-204
Anchorage & Berthing	583	432	151
Loading & Unloading	11	8	3
Porterage	7	7	0
Storage	46	13	33
Average	27	19	8

Source: Company statements.

It is recommended that the Tartous Port Company hire an accounting consultant to design an integrated financial and cost accounting system suitable to the port's operation. This consultant should supervise a fixed asset and material physical inventory; help in evaluating fixed assets and materials in stocks; supervise the implementation of the new accounting system; and train the accounting staff. The implementation supervision should continue until the first annual financial statements of the new system are produced and the system is operating smoothly.

C-4.3 PROJECTED PROFITABILITY AND FINANCIAL PLAN

Revenues and expenses for the 5th Five-Year Plan by year, and by plan period from 1981-2000 are shown in Tables C-4.5 and C-4.6.

These projections have been based on the following assumptions:

- Revenues are in accordance with the proposed tariff structure discussed in Chapter A-4.

- Wages are assumed to have increased in proportion to the early 1980 Government-wide salary increase.

- Other variable unit costs are assumed to have increased by 15 percent by mid-1980.

- Fixed costs are increased at intervals appropriate to new investment and greater activity.

- Operations are forecast at levels consistent with forecast traffic and under conditions of increasing productivity resulting from implementation of the recommendations made in this report.

As with Lattakia, the new tariff raises revenues per ton from SP 23.9 in 1978 to SP 39.8 in 1981, and higher costs raise expenses from SP 12.5 per ton in 1978 to SP 17.0 per ton in 1981. But with revenues rising faster than expenses, net profit per ton increases. As a result of these changes, revenues increase from SP 57.7 million in 1978 to SP 105.2 million in 1981.

During the 5th Plan, profits decline slightly through 1984 primarily as a result of increasing depreciation, as the expansion of the port is completed. This phenomenon holds true for the period 1986-1990, but in the ensuing ten years, profits rise as depreciation declines slightly and increasing amounts of containerized and palletized cargo result in more efficient operations.

Tables C-4.7 and C-4.8 show the port financial plan for the 5th Plan and 1981-2000.

Table C-4.6 shows that profits after tax and depreciation charges are insufficient for meeting planned investments during the 5th Plan period. But these annual deficits become a surplus in the period 1986-1990. By the year 2000, cumulative internally generated funds are sufficient not only to meet all planned investment expenditures but to accumulate a surplus of SP 1,073 million.

As in the other modes, it must be pointed out that these calculations do not include availability of new foreign loans or repayments required on existing foreign loans which may have been earmarked specifically for port projects. Likewise, there is no interest charge made for any type of existing debt. The Consultants feel strongly that such items should be included in any proper analysis of this sort, but adequate data have not been made available. It is recommended that Syrian planners insert such information into the computer programs which generated these analyses while updating and reviewing each of these programs as new developments occur and more refined information becomes available.

Table C-4.5

TARTOUS PORT COMPANY

FINANCIAL PLAN 1981 - 1985

(SP Million)

	1981			1982			1983		
	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL
Capital Expenditures									
Investments									
Complete Tartous Port	60.0	63.0	123.0	52.0	55.0	107.0	48.0	51.0	99.0
Equipment	4.2		4.2	4.2		4.2	3.8		3.8
Total Investments	64.2	63.0	127.2	56.2	55.0	111.2	51.8	51.0	102.8
Foreign Loan Repayments	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	64.2	63.0	127.2	56.2	55.0	111.2	51.8	51.0	102.8
Funds Available									
Internally Generated[1]	16.1	43.0	59.1	18.5	62.3	80.8	21.5	81.3	102.8
Foreign Loan	-	-	-	-	-	-	-	-	-
Total Funds Available	16.1	43.0	59.1	18.5	62.3	80.8	21.5	81.3	102.8
Annual Excess/ Deficit	-48.1	-20.0	-68.1	-37.7	7.3	-30.4	-30.3	30.3	0
Cumulative Excess/ Deficit	-48.1	-20.0	-68.1	-85.5	-12.7	-98.5	-116.1	17.6	-98.5

Table C-4.5 (Continued)

TARTOUS PORT COMPANY

FINANCIAL PLAN 1981 - 1985

(SP Million)

	1984			1985			TOTAL		
	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL
Capital Expenditures									
Investments									
Complete Tartous Port	50.0	51.0	101.0	-	-	-	210.0	220.0	430.0
Equipment	3.8		3.8	3.8		3.8	19.8		19.8
Total Investments	53.8	51.0	104.8	3.8	-	3.8	229.8	220.0	449.8
Foreign Loan Repayments	-	-	-	-	-	-	-	-	-
Total Capital Expenditures	53.8	51.0	104.8	3.8	-	3.8	229.8	220.0	449.8
Funds Available									
Internally Generated[1]	25.4	100.0	125.4	30.1	39.3	69.4	111.6	325.9	437.5
Foreign Loan	-	-	-	-	-	-	-	-	-
Total Funds Available	25.4	100.0	125.4	30.1	39.3	69.4	111.6	325.9	437.5
Annual Excess/ Deficit	-28.4	49.0	20.6	26.3	39.3	65.6	-118.2	105.9	-12.3
Cmulative Excess/ Deficit	-144.5	66.6	-77.9	-118.2	105.9	-12.3	-	-	-

Source: Consultants' estimates.

[1] After tax.

Table C-4.6

TARTOUS PORT COMPANY
FINANCIAL PLAN 1981 - 2000

(SP Million)

	1981-1985			1986-1990			1991-1995			1996-2000			TOTAL		
	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL	FO.EX	LO.CU	TOTAL
Capital Expenditures															
Investments															
Complete Tartous Port	210.0	220.0	430.0	-		-		-	-	-	-		210.0	220.0	430.0
Equipment	19.8	-	19.8	22.4		22.4	20.0		20.0	20.0		20.0	82.2		82.2
Total Investments	229.8	220.0	449.8	22.4		22.4	20.0		20.0	20.0		20.0	292.2	220.0	512.2
Foreign Loan Payments	-	-	-	-	-	-		-		-	-	-	-	-	-
Total Capital Expenditures	229.8	220.0	449.8	22.4	-	22.4	20.0	-	20.0	20.0	-	20.0	297.2	220.0	512.2
Funds Available															
Internally Generated[1]															
Foreign Loans	111.6	325.9	437.5	159.3	200.5	359.8	174.5	207.0	381.5	191.0	215.1	406.1	636.4	948.5	1,584.9
Total Funds Available	111.6	325.9	437.5	159.3	200.5	359.8	174.5	207.0	381.5	191.0	215.1	406.1	636.4	948.5	1,584.9
Excess/Deficit	-118.2	105.9	-12.3	136.9	200.5	337.4	154.5	207.0	361.5	171.0	215.1	386.1	344.2	728.5	1,072.7
Cumulative Excess/ Deficit	-118.2	105.9	-12.3	18.7	306.4	325.1	173.2	513.4	686.6	344.2	728.5	1,072.7	-	-	-

Source: Consultants' estimates.

1 After Tax.

Table C-4.7

TARTOUS PORT COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981 - 1985

(SP Million)

	1981	1982	1983	1984	1985	Total
Revenues						
Vessel Charges						
Pilotage/Towage	5.0	5.1	5.2	5.2	5.3	25.8
Berthing	2.3	2.1	1.9	1.8	1.6	9.7
Mooring	0.3	0.2	0.1	0.1	-	0.7
Total Vessel Charges	7.6	7.4	7.2	7.0	6.8	36.0
Charges on Goods						
Loading/Unloading	156.8	161.7	166.5	171.3	176.2	832.5
Storage	6.6	6.5	6.5	6.4	6.3	32.3
Silo	-	-	-	-	-	-
Cold Storage	3.0	3.1	3.1	3.2	3.2	15.6
Total Charges on Goods	166.5	171.3	176.1	180.9	185.7	880.5
Other	9.7	9.9	10.2	10.5	10.8	51.1
Total Revenues	183.7	188.6	193.5	198.4	203.3	967.5
Operating Expenses						
Wages and Salaries	48.1	51.4	54.9	58.7	62.7	275.8
Maintenance and Repairs	2.3	2.3	2.3	2.3	2.4	11.6
Spare Parts	3.0	3.1	3.1	3.1	3.2	15.5
Fuel, Oil and Lubricants	1.1	1.1	1.2	1.2	1.2	5.8
Other	0.8	0.8	0.8	0.8	0.8	4.0
Total Operating Expenses	55.3	58.6	62.3	66.1	70.2	312.5
Operating Profit before Depreciation	128.4	130.0	131.3	132.3	133.1	655.1
Depreciation	14.8	19.5	23.9	28.4	28.0	114.6
Operating Profit	113.6	110.5	107.4	103.9	105.1	540.5

Table C-4.7 (Continued)

TARTOUS PORT COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981 - 1985

(SL Million)

	1981	1982	1983	1984	1985	Total
Other Expenses						
Administration	8.5	8.5	8.5	8.5	8.5	42.5
Interest	-	-	-	-	-	-
Total Other Expenses	8.5	8.5	8.5	8.5	8.5	42.5
Profit Before Tax	105.2	102.0	89.9	95.4	96.6	498.1
Tax	69.3	67.2	65.2	62.9	63.7	328.3
Profit After Tax	35.9	34.8	33.7	32.5	32.9	169.8

Source: Consultants' estimates.

Table C-4.8

TARTOUS PORT COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981-2000

(SP Million)

	1981-1985	1986-1990	1991-1995	1996-2000	Total
Revenues					
Vessel Charges					
Pilotage/Towage	25.8	27.7	30.0	32.3	115.8
Berthing	9.7	8.3	9.0	9.7	36.7
Mooring	0.7	-	-	-	0.7
Total Vessel Charges	36.0	36.0	39.0	41.9	152.9
Charges on Goods					
Loading/Unloading	832.5	919.1	982.8	1,046.5	3,780.9
Storage	32.3	34.4	39.0	43.6	149.3
Silo	-	-	-	-	-
Cold Storage	15.6	17.5	19.7	22.0	74.8
Total Charges on Goods	880.5	971.0	1,041.6	1,112.1	4,005.1
Other	51.1	56.3	60.4	64.5	232.3
Total Revenues	967.5	1,063.3	1,140.9	1,218.6	4,390.3
Operating Expenses					
Wages and Salaries	275.8	319.6	327.3	332.1	1,254.8
Maintenance and Repairs	11.6	16.6	22.5	29.0	79.7
Spare Parts	15.5	16.6	18.0	19.4	69.5
Fuel, Oil and Lubricants	5.8	6.2	6.7	7.3	26.0
Other	4.0	4.2	4.5	4.8	17.5
Total Operating Expenses	312.5	363.2	378.9	392.6	1,447.2
Operating Profit before Depreciation	655.1	700.1	762.0	826.0	2,943.2
Depreciation	114.6	137.3	134.1	134.1	520.1

Table C-4.8 (Continued)

TARTOUS PORT COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981-2000

(SF Million)

	1981-1985	1996-1990	1991-1985	1996-200	Total
Other Expenses					
Administration	42.3	46.6	50.8	55.0	194.7
Interest	-	-	-	-	-
Total Other Expenses	42.3	46.6	50.8	55.0	194.7
Profit Before Tax	498.1	516.3	577.1	636.8	2,228.3
Tax	328.3	340.3	380.5	419.9	1,469.0
Profit After Tax	169.8	176.0	196.6	216.9	759.3

Source: Consultants' estimates.

D

PART D

SHIPPING

Chapter D-1

SHIPPING

D-1.1 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Major Findings

The Syrian Merchant Navy, as of 30 December 1979, consisted of 40 motor cargo ships, 35 of which were less than 1,000 tons deadweight, in a poor state of repair, and at, or near, the end of their economic life. In terms of deadweight tonnage, the five multipurpose and general cargo ships operated by the two Government-owned shipping companies can lift an aggregate amount almost equal to the other 35 vessels. In 1978, over 90 percent of all non-petroleum imports and virtually all of the non-petroleum exports were carried by foreign flag vessels.

By value, 45 percent of the total value of imports to Syria and 53 percent of the total value of exports from Syria is with Western Europe. Eastern Europe, Russia, and China are the source of 20 percent of Syrian imports by value and receive 22 percent of Syrian exports by value.

The Consultants' traffic projections indicate that tonnage imports to the Ports of Lattakia and Tartous will increase by 45 percent in the next 20 years, while exports will nearly double. Projections for containerized tonnage also indicate steady yearly increases. Approximately 2.4 million tons were shipped from Western Europe for import to Syria in 1979, and this tonnage will steadily increase to some 3.5 million tons by the year 2000.

If 40 percent of this trade could be captured by Syrian ships and the average tonnage lifting of each is 5,000 deadweight tons, 35 Syrian ships would be required by the year 2000. If each vessel has an average crew of 30, 1,300 (including 25 percent replacement for reliefs) people would be required for dry cargo ships over the 20 years.

There are no Syrian vessels participating in the now considerably valuable bulk phosphate trade to Korea, sugar trade with Cuba, or bulk grain trade, and only a miniscule amount of cargo is handled by Syrian ships in the Black Sea and Adriatic.

The two newly acquired Polish-built vessels of the Syrian-Jordanian Navigation Company are of excellent design and performance and are well suited to existing and future dry cargo operations at the Ports of Tartous and Lattakia. The construction costs of each vessel were half those of the costs proposed

by the Harmstorf Group (Hamburg) for four similar but slower vessels required to start a proposed new joint venture company.

The General Directorate of Ports does not have adequate capability to survey or classify ships or to enforce laws requiring owners to maintain their vessels to international standards of seaworthiness. There are no fully qualified Government hull or machinery surveyors to carry out surveys and to authorize and supervise necessary structural maintenance work on ships, drydocking, etc. There is no program at present for the training of ships officers and crews, and the certification of officers needs to be strengthened.

Major Recommendations

The Consultants' major recommendations follow:

- Syria should undertake a program of building 35 ships to a standard pattern of 6,300 tons deadweight each to be completed by the year 2000. In order to spread the crew and financing requirements, the Consultants recommend a total of 19 ships for the Syrian Navigation Company to be delivered over a year beginning in 1982 and a total of 15 ships for the Syrian-Jordanian Navigation Company to be delivered one per year beginning in 1985.

- The training and manpower needs of the proposed Syrian fleet should be the object of a special feasibility study to determine the best method of developing a trained cadre of Syrian ships officers. The establishment of a National Maritime Academy should be part of the recommended feasibility study to analyze precisely the need for such an establishment.

- Initially, fully qualified foreign masters, officers, and engineers should be recruited on a contract basis for from 5 to 10 years to staff the vessels and to help train Syrian replacements for the proposed new tonnage; and until such time as a National Maritime Academy is established, Syrian marine officers should be sent to internationally accepted marine colleges on a regular basis to complete courses for various grade examinations.

- The design of the new "Al Yarmouk" type vessel should be accepted as the general standard 6,300 deadweight ton multipurpose cargo vessel and consideration should be given to the incorporation at the tween deck level of double water-tight doors on both the port and starboard sides to enable the ships to have a roll on/roll off capacity for use when and where practicable.

- Vessels over 30 years old belonging to private Syrian owners should be gradually phased out and the owners encouraged to invest in new tonnage. A new general design for vessels of 1,500 tons, single deck, should be scrutinized and accepted as standard in order to gradually replace the old and inefficient smaller ships in the private sector.

- A department should be created with qualified surveyors for classifying and surveying ships, using qualified foreigners on contract if necessary to commence implementation.

- A regulatory body - Registrar of Shipping and Seamen - should be incorporated in the General Directorate of Ports to supervise ships masters, engineers, officers, and staff.

- Suitable officers should go abroad for higher qualifications to enable them to fill appointments as Government marine surveyors and as examiners in navigation, seamanship, and engineering. They will form a nucleus of experts for future drydock and structural repair work and so forth and will become tutors in a future indigenous marine college if required.

D-1.2 INVENTORY OF THE SYRIAN FLEET

The two largest companies in the Syrian Merchant Fleet are the Government-owned Syrian Navigation Company and the newly constituted Syrian-Jordanian Navigation Company. The Syrian Navigation Company operates three modern vessels, of which two are general cargo and one is multipurpose cargo, with an aggregate deadweight tonnage of 11,556 tons. The Syrian-Jordanian Navigation Company, which is a joint venture between the Syrian and Jordanian Governments, owns two new Polish-built multipurpose cargo vessels of 6,300 deadweight tons each.

The remainder of the Syrian fleet is a miscellany of small general cargo vessels owned largely by single individuals or small partnerships and operating rarely more than one vessel per company. Most are employed in the local coastal trade and with transshipment cargoes from Cyprus and Greece. All are ageing and not well maintained, and some are in an advanced stage of disrepair.

D-1.3 SYRIAN FLEET CARGOES

Examination of Syrian marine aggregate tonnage and the number of suitable vessels available indicates that, due to the limited capacity of the fleet, Syria can contribute relatively little to the carriage of international cargoes passing through her own ports.

Excluding transit traffic, a total of 5,345,000 tons of cargo other than petroleum was imported into Syria in 1979 through the Ports of Tartous and Lattakia. This general cargo trade is handled by both liner and tramp ship services, and over 90 percent of the cargo is carried in foreign flag bottoms. Almost all of the non-petroleum export tonnage (1,835,000 tons in 1979) was lifted by foreign carriers.

Of the 90 percent of imports taken by foreign vessels, the greatest share is lifted by Russian, West German, Italian, Greek, Swedish, and Roumanian flag ships, mostly all on liner service.

Data available on tramp shipping are inexact, but there is a vigorous local Mediterranean trade of considerable value carried out between Lebanon, Cyprus, Yugoslavia, Greece, Italy, and the Black Sea and almost entirely by each country's own vessels. The 35 Syrian vessels owned by private sector operators are almost entirely employed in local cross trade and tramp ship operation, but with an average deadweight tonnage of 825 tons per ship, they can make little impact on this lively Mediterranean intercoastal trade.

The statistics of the Ports of Lattakia and Tartous show that the most important Syrian imports are: vehicles, iron and scrap, cement, foodstuffs, machinery, and sugar. These commodities come from a wide variety of geographical sources, with high value goods being imported mainly from Western Europe and its European Economic Community (EEC). These goods include vehicles, transport equipment, accessories, and steel from the Federal Republic of Germany; foodstuffs from France and Holland; piece goods and quality clothing from the United Kingdom and Europe generally; and chemicals, chemical products, and heavy machinery.

The direction of trade by value (See Table D-1.1) indicates that Syria imported 45 percent of the total value from, and exported 52.5 percent of the total value to, the EEC and the rest of Europe. The percentage direction of trade with the rest of the world breaks down as follows: imported from the socialist countries of Eastern Europe and China, 20 percent by value, and exported 22 percent by value; the Arab countries, 16 percent and 14 percent respectively; and approximately 19 percent import by value and 6 percent export by value to the U.S.A., Canada, and the rest of the world. As Table D-1.1 indicates, the shares have remained relatively constant.

Examination of available statistics of Lattakia and of Tartous harbors show which nationalities are capturing the biggest proportion of all cargoes moving into and out of those ports.

Table D-1.1

DIRECTION OF TRADE - BY VALUE

Area	Imports by Percent					
	1970	1974	1975	1976	1977	1978
E.E.C.	26.6	39.2	39.1	33.4	38.2	35.2
Eastern Europe & China	24.2	20.0	16.0	10.2	19.4	19.9
Arab Countries	17.6	13.8	10.1	12.7	14.9	15.6
Rest of Europe	7.3	10.9	9.9	24.3	10.5	9.9
USA & Canada	10.5	4.3	6.6	6.0	5.5	5.1
Rest of World	13.8	11.2	17.7	13.4	11.5	14.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Area	Exports by Percent					
	1970	1974	1975	1976	1977	1978
E.E.C.	30.6	30.9	47.5	48.7	46.8	44.6
Eastern Europe & China	20.6	31.7	22.4	25.3	25.5	22.4
Arab Countries	25.0	13.8	9.5	10.9	12.9	13.5
Rest of Europe	8.8	19.2	6.3	9.9	9.3	7.9
USA & Canada	0.4	0.3	0.6	1.0	3.8	9.0
Rest of World	8.9	4.1	13.7	4.2	1.7	2.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Central Bureau of Statistics/General Directorate of Customs.

At Tartous, Russian vessels claim 20 percent and Greek vessels 19 percent; Swedish vessel liftings increased from 2 percent in 1977 to 10 percent in 1978. Syrian vessels lifted a modest 4 percent in 1977, which increased to 7 percent in 1978.

Data for Lattakia Port for 1978 show 2,035 vessel arrivals of all nationalities, of which 365 (18 percent) were Greek, 185 (9 percent) Russian, 296 (15 percent) Cypriot, and 134 Syrian. Syrian vessels as a percent of vessel arrivals at the Port of Lattakia have not yet made a significant impact on the volume of available liftings being imported to and exported from Syria.

The two latest vessels of the Syrian-Jordanian Navigation Company have a deadweight capacity of 6,300 tons each. Presuming at least 6.3 voyages per year at a service speed of 15.5 knots, they would make an aggregate lifting of 63,000 tons of cargo per year. With approximately 1.75 million tons of import cargo available from Western Europe, the vessels can make little impression on total future liftings, even though their introduction is of importance to the Syrian merchant fleet.

D-1.4 POTENTIAL FOR OPERATIONS

The desire of any country with access to the sea and with one or two good ports to own and operate its own national flag vessels is natural, understandable, and in Syria's case, also economically sound.

Since Syria's dependence on overseas trade moving by sea is already heavy and is growing yearly, it would be prudent and realistic to capture a reasonable proportion of the trade available rather than to rely completely on foreign owned and operated ships. A reasonably sized national fleet would provide employment for Syrian nationals, generate much-needed foreign exchange, and give Syrian managers and operators more control over seaborne freight charges and the general movement of freight into and out of Syrian ports.

Two basic types of maritime trade are available to Syria, liner and tramp operations. Dry bulk cargoes are generally lifted by tramp ships independently or by tramp ships on time charter to liner companies.

Cargoes accepted by vessels in the liner trade are necessarily a multiplicity of goods and commodities, which may vary from bagged grain and crated or containerized piece goods to open-stowed cars and trucks. Liners, then, by definition, are

vessels which trade on a schedule as nearly as possible between specific ports on a regular basis. The ideal trading criterion is full cargoes both homewards and outward moved with the utmost dispatch in order to ensure a reasonable balance of trade and profitability in terms of revenue tons. Punctuality in meeting arrival dates on the liner's itinerary, and efficient dispatch, are both very necessary to gain the confidence of both shippers and consignees in any new venture of this nature.

The United Nations "Convention on a Code of Conduct for Liner Companies," created at a session in April 1974, laid down guidelines for a fairer distribution of cargo volumes between domestic- and foreign-owned ships, especially for nonindustrialized nations. The convention provides a proportion of 40:40:20 - 40 percent for vessels from the country of origin, 40 percent for vessels from the country of destination, and 20 percent for interested third-party shipping lines. This convention would seem to validate a bigger Syrian share of the overall seaborne trade.

A vigorous cross trade is also being conducted almost entirely by vessels of the countries of origin in the Black Sea, Adriatic, and Mediterranean, with imports from this region being approximately 20 percent of the total value of Syria's foreign trade. The most important traders are the U.S.S.R., Greece, Rumania, Hungary, Cyprus, Bulgaria, Yugoslavia, and Italy. Syrian participation in this area should be closely studied, with a view to obtaining a greater share of this dry cargo cross trade.

A more detailed investigation should also be made into the possible acquisition of several deep-sea tramp ships to be used either as each-way bulk carriers, or alternatively, as occasional part-containerized, break-bulk vessels. These would be constructed to participate in the considerable bulk cargo trade to and from Syria. The main bulk commodities are sugar, grain, and phosphate.

There are currently two bulk carriers on time charter running regularly and profitably between Tartous and North Korea. Their cargoes comprise a full deadweight lifting of phosphate outward and a full cargo of grain homeward. Very little delay is experienced because cargoes at the phosphate pier are loaded with dispatch, and the pier is normally clear for berthing in a very short time. There is no apparent reason why Syrian vessels could not acquire a share of this trade, which appears to be profitable (with full cargoes both ways) and regular, and as projections indicate, will probably continue to be so into the year 2000.

D-1.5 TYPICAL VOYAGE PATTERNS

Analysis of the voyage performance of the Syrian-Jordanian Navigation Company's two sister ships, Barada and Al Yarmouk, has revealed an average voyage pattern in the year 1979 as follows:

Loading in European ports	7 days
Southbound passage to Syria	13.5 days
Time at anchor awaiting berth	20.0 days
Time to discharge cargo alongside	11.0 days
Northbound passage to Europe	13.5 days
Total round trip voyage	65.0 days

Southbound cargoes average 5,000 tons deadweight, with cargo being loaded at Bremen/Hamburg, Rotterdam, Amsterdam, Antwerp, and LeHavre. Northward cargo is mainly a number of empty containers and an occasional small lifting of citrus fruit and cotton. Two of the three operating dry cargo vessels of the Syrian Navigation Company, M.V.S. ARWAD and DIMACHK, which are similarly run on liner services to northern Europe, have very similar performance patterns. Although liftings of cargo average only 3,100 tons, including 30 to 40 containers, it must be remembered that the vessels are smaller and have a slower average speed. Northbound, frequent cargoes of cotton for Sousse/Antwerp, citrus fruit for Cyprus, and 30 or more empty containers are loaded. Average liftings of cotton and citrus fruit are 1,000 tons and 1,100 tons respectively. The average voyage performances of ARWAD and DIMACHK are as follows:

Loading in European ports	7 days
Southbound passage to Syria	15 days
Time at anchor awaiting berth	16 days
Time to discharge alongside	10 days
Northbound passage to Europe	15 days
Total round trip voyage	63 days

These operational figures are good, and they should improve as congestion in the Ports of Tartous and Lattakia decreases and waiting time consequently diminishes.

The Syrian Navigation Company is chartering one-voyage charter vessels to meet their commitments. This has amounted to from three to six single-voyage charters per year, and the motor vessel LAZIQUIEH, of 3,898 tons deadweight, is presently regularly employed on voyage charters from Venice to Lattakia, with full cargoes of timber southbound. Other cargo parcels are accepted, as and when available, on the northbound trip.

D-1.6 SYRIAN FLEET EXPANSION

General

As noted, Syrian participation in total cargo shipping amounted to only 7 percent of all tonnage moved in 1978. A determined effort to capture an increasingly bigger share should be the objective of both public and private Syrian shipping interests, assuming that it is economically and financially feasible.

The most valuable general cargo trade in monetary terms is that with Western Europe, which supplies 45 percent of all goods imported into Syria. This amounted to 1,690,500 tons out of a total seaborne trade of 3.5 million in 1978. If Syria had captured 25 percent of this trade, a total of 422,625 tons would have been available to Syrian bottoms.

Vessel Characteristics

When considering the purchase of new tonnage, it is very important that the design and characteristics of the vessel selected be the best to suit present trading conditions and probable future cargo trends. The normal economic life of a ship varies from 20 to 25 years, depending upon the original quality of her construction, but a well designed, well built, and well maintained vessel may have a useful and reasonably economic life 10 years or more beyond her usual operational span.

When examining future construction trends in the building of dry-cargo vessels, particularly the type which will best suit Syrian requirements, a vessel designed for container carriage, but with its own capability for independent loading and discharging of break-bulk or pre-palletized cargo, would be the most suitable as a multipurpose carrier into the foreseeable future.

In Section D, Shipping, Volume V of the Final Phase I Report, alternative ship designs were examined in detail. A multipurpose cargo vessel design was recommended to gradually take over some of the coastal trade now being handled by the ageing and inefficient coasters. These old craft should be gradually phased out and replaced by small, modern ships of around

1,500 deadweight tons, capable of rapid deployment to the smaller ports where draft restrictions would preclude the use of the larger ocean-going vessel. These vessels would be ideal in the transshipment mode, of which much deadweight tonnage is being lost to Cypriot and other vessels.

The analysis also noted that, in terms of capability and cost, the preferred design for a vessel to be procured for the liner trade to Europe would be the design of the Syrian-Jordanian Navigation Company's two new Polish-built sister ships, Barada, completed in 1979, and Al Yarmouk, completed in January 1980. Their construction is for open or closed shelter-deck operations. The bridge, crew's accommodation, and main engines are amidships. The hull is of one tween deck construction and three cargo holds forward of the bridge with a main deck and raised forecastle head. Their general specifications are:

Length O.A.		123.8 m
Length B.P.		114.0 m
Breadth Moulded		16.99 m
Summer Draught		7.3 m
Tonnage Mark Draught		6.5 m
Deadweight at Summer Draught		6,333 tons
Deadweight at Tonnage Mark		4,934 tons
Main Engine 5 cyl. Diesel		6,100 s.h.p. @ 142 r.p.m.
Speed at Loaded Draught		15.5 knots
Cruising Range		7,000 miles
Cargo Capacity	Grain	293,918 ft.^{3}
Cargo Capacity	Bale	267,468 ft.^{3}
Container Capacity		50 T.E.U. below decks
		14 T.E.U. on deck
		64 Total Container T.E.U.
One Freezer Compartment		500 tons
Crew (including Master)		32 (including 2 shipyard engineers)
		8 berths

Passengers

The principal design advantages of a shelter deck vessel are:

- Low gross and net tonnage, resulting in a savings in port charges.

- High ratio of bale/grain space to deadweight capacity for cargo, which makes the shelter-deck type of ship especially suitable for the carriage of lighter cargoes. Modern shelter-deck vessels are so constructed that full cargoes of heavy grain can also be accommodated almost entirely in the lower holds.

- A good ratio of deadweight capacity to displacement, so that the vessels' engines are employed to transport cargo (and not for driving a heavy hull through the water), with consequent savings in fuel costs.

- In heavy weather, the shelter-deck vessel may suffer less damage because her draught is smaller than that of a full scantling vessel of the same dimensions.

The price of these vessels, which were completed in just six months, was SP 18.3 million.

If this design is adopted, consideration should be given to the incorporation at the tween deck level of double water-tight doors on both the port and starboard sides in the future design and construction of this multi-purpose cargo vessel. This innovation would enable a ship to have a roll on/roll off capacity for use when and where practicable.

Vessel Requirements

As noted earlier, potential cargo availability is not a limiting factor in the expansion of the Syrian maritime fleet. Assuming reasonable profitability (discussed below), availability of funds, the ability of management to deal with an expanding fleet and crew requirements are the governing factors.

Actual voyage performances of the ships of both companies, shown in Section D-1.5 above, have been used as a basis for projecting fleet requirements from 1981 to the year 2000. Voyage time in 1981 is assumed to be the same as in 1979, but the apparent elimination of congestion in the Syrian ports should permit each ship to make its round-trip voyage in only 45 days from 1985 onward, and perhaps earlier.

Projections indicate that tonnage imports to the Ports of Lattakia and Tartous will increase 45 percent in the next 20 years. Containerized tonnage projections also indicate a steady yearly increase. Accepting that 2.4 million tons were shipped from Western Europe for imports to Syria in 1979, this volume will then steadily increase to some 3.5 million tons by the year 2000.

Thus, if 40 percent of this trade could be captured by Syrian ships, and given an average tonnage lifting of 5,000 deadweight tons per ship, each ship making 7.8 trips per year, then there would be a requirement of 35 Syrian ships by the year 2000. This percentage is within the parameters of the United Nations 40:40:20 ratio stipulated in its "Convention on a Code of Conduct for Liner Companies."

In order to spread out the financing and crew requirements, the Consultants propose the acquisition of a total of 35 ships by the year 2000, with 19 ships purchased for the Syrian Navigation Company and 16 ships purchased for the Syrian-Jordanian Navigation Company. Procurement would be at the rate of one ship per year with delivery to the two companies beginning in 1982 and 1985 respectively.

Financial Profitability Analysis

The financial profitability analysis is based on the assumption of only one lifting (i.e., the southbound voyage) being used for revenue freight calculations. Northbound cargoes are being lifted, but not regularly, so they have been omitted from the calculations. Thus, any northbound cargo will obviously increase the overall voyage profitability. There will be an estimated 1.1 million tons of northbound cargoes to Europe by the year 2000, and the assumption that Syrian vessels could not capture a part of this trade is very conservative. An average lifting of a typical mixed dry cargo of 5,000 tons (3,000 tons for the Syrian Navigation Company's existing three smaller ships) has been used as a model for the southbound voyages of each company.

Operating revenues in the financial profitability analysis are expressed as the Syrian pound equivalent of foreign exchange. This is done because all freights, whether on liner terms, bill of lading, or charter-party, are agreed on in either Deutsch marks, U.S. dollars, British sterling, or another mutually acceptable hard currency.

Freight rates have been calculated in accordanace with the general rules of the Zurich Agreement on Liner Tariffs, valid for conference line signatories as of 15 October 1979.

All costs and revenues except crew wages have been entered at a actual 1980 prices. Because the rapidly increasing demand for trained crew cannot be met by local sources, as discussed in other sections, this expense has been calculated on the basis of expatriate officers and local crew during the early years being gradually replaced by a completely Syrian crew as local officers become available. Stand-by crew expenses are included, but the costs of training additional Syrian officers are not. No attempt has been made to include the effects of inflation or any increased real costs of fuel oil.

Annual financial profitability analyses for the period 1981-1985 and profitability analyses in five-year increments are shown in Tables D-1.2 and D-1.3 for the Syrian Navigation Company and Tables D-1.4 and D-1.5 for the Syrian-Jordanian

Table D-1.2

SYRIAN NAVIGATION CO.

FINANCIAL PROFITABILITY ANALYSIS 1981-1985

(SP 000)

	1981	1982	1983	1984	1985
REVENUES					
Operating Revenues	49,920	63,792	58,880	65,836	66,839
TOTAL REVENUES	49,920	63,792	58,880	65,836	66,839
OPERATING EXPENSES					
Crew Wages	4,536	6,882	6,882	9,228	11,574
Bunker Fuel	7,149	8,698	9,426	11,252	13,262
Port Fuel	1,366	2,035	1,860	2,329	2,663
Provisions & Water	686	1,076	1,076	1,466	1,856
Repairs & Maintenance	484	874	874	1,264	1,654
Stevedoring	5,276	7,963	8,685	12,020	15,801
Port Dues & Pilotage	953	1,513	1,653	2,351	3,145
Insurance	1,434	1,668	1,668	1,902	2,136
Depreciation	1,193	2,318	2,318	3,443	4,568
TOTAL OPERATING EXPENSES	23,078	33,028	34,441	45,254	56,659
OPERATING PROFIT	26,843	30,764	24,438	20,582	10,179
OTHER EXPENSES					
Administration	230	230	230	230	230
Interest					
TOTAL OTHER EXPENSES	230	230	230	230	230
PROFIT BEFORE TAX	26,613	30,534	24,208	20,352	9,949
TAX	17,481	20,068	15,893	13,348	6,482
PROFIT AFTER TAX	9,132	10,466	8,315	7,004	3,467

Source: Consultants' estimates.

Table D-1.3

SYRIAN NAVIGATION COMPANY

FINANCIAL PROFITABILITY ANALYSIS 1981-2000

(SP millions)

	1981-1985			1986-1990			1991-1995			1996-2000			Total		
	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.EX.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu	Total
Revenues															
Operating Revenues	305.3		305.3	484.2		484.2	691.9		691.9	968.8		968.8	2450.2		2450.2
Total Revenues	305.3		305.3	484.2		484.2	691.9		691.9	968.8		968.8	2450.2		2450.2
Operating Expenses															
Crew Wages	-	39.1	39.1	-	88.4	88.4	-	130.6	130.6	-	186.9	186.9	-	445.0	445.0
Bunker Fuel	24.9	24.9	49.8	40.9	40.9	81.8	51.6	51.6	103.2	65.9	65.9	131.8	183.3	183.3	366.6
Port Fuel	5.1	5.1	10.2	10.4	10.4	20.8	15.6	15.6	31.2	22.5	22.5	45.0	53.6	53.6	107.2
Provisions & Water	3.1	3.1	6.2	7.2	7.2	14.4	10.7	10.7	21.4	15.4	15.4	30.7	36.4	36.4	72.8
Repairs and Maintenance	-	5.2	5.2	-	13.3	13.3	-	20.4	20.4	-	29.7	29.7	-	68.6	68.6
Stevedoring	24.9	24.9	49.8	58.0	58.0	115.9	83.5	83.5	167.1	117.6	117.6	235.2	284.0	284.0	568.0
Port Dues and Pilotage	4.8	4.8	9.6	11.8	11.8	23.6	17.3	17.3	34.6	24.6	24.6	49.1	58.5	58.4	117.0
Insurance	-	8.8	8.8	-	13.7	13.7	-	17.9	17.9	-	23.6	23.6	-	64.0	64.0
Depreciation	-	13.8	13.8	-	37.5	37.5	-	57.7	57.7	-	84.7	84.7	-	193.7	193.7
Total Operating Expenses	62.8	129.7	192.5	128.2	281.1	409.4	178.7	405.3	584.0	245.9	570.8	816.8	615.6	1386.9	2002.7
Operating Profit	242.5	-129.7	112.8	356.0	-281.1	74.8	513.2	-405.3	107.9	722.9	-570.8	152.1	1834.6	-1386.9	447.7
Other Expenses															
Administration		1.2	1.2		1.7	1.7		2.3	2.3		2.9	2.9		8.1	8.1
Interest															
Total Other Expenses		1.2	1.2		1.7	1.7		2.3	2.3		2.9	2.9		8.1	8.1
Profit Before Tax	242.5	-130.9	111.6	356.0	-282.9	73.1	513.2	407.6	105.6	722.9	-573.7	149.2	1834.6	-1395.0	439.6
Tax			73.3			47.8			69.3			98.0			288.4
Profit After Tax			38.3			25.3			36.3			51.2			151.2

Source: Consultants' estimates.

Table D-1.4

SYRIAN-JORDANIAN NAVIGATION CO.

FINANCIAL PROFITABILITY ANALYSIS 1981-1985

(SP 000)

	1981	1982	1983	1984	1985
REVENUES					
Operating Revenues	34,058	32,836	30,603	27,323	34,617
TOTAL REVENUES	34,058	32,836	30,603	27,323	34,617
OPERATING EXPENSES					
Crew Wages	4,692	4,692	4,692	4,692	7,038
Bunker Fuel	1,644	1,828	2,013	2,197	3,573
Port Fuel	1,687	1,553	1,420	1,286	1,728
Provisions & Water	780	780	780	780	1,170
Repairs & Maintenance	780	780	780	780	1,170
Stevedoring	3,931	4,370	4,810	5,242	8,521
Port Dues & Pilotage	841	935	1,029	1,121	1,823
Insurance	468	468	468	468	702
Depreciation	2,250	2,250	2,250	2,250	3,375
TOTAL OPERATING EXPENSES	17,073	17,657	18,241	18,816	29,099
OPERATING PROFIT	16,985	15,179	12,363	8,507	5,518
OTHER EXPENSES					
Administration	195	195	195	195	195
Interest					
TOTAL OTHER EXPENSES	195	195	195	195	195
PROFIT BEFORE TAX	16,790	14,984	12,168	8,312	5,323
TAX	10,997	9,805	7,947	5,402	3,429
PROFIT AFTER TAX	5,793	5,179	4,221	2,910	1,894

Source: Consultants' estimates.

Table D-1.5

SYRIAN-JORDANIAN NAVIGATION CO.

FINANCIAL PROFITABILITY ANALYSIS 1981-2000

(SP millions)

	1981-1985			1986-1990			1991-1995			1996-2000			Total		
	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total
Revenues															
Operating Revenues	159.4		159.4	346.2		346.2	634.6		634.6	877.0		877.0	2017.2		2017.2
Total Revenues	159.4		159.4	346.2		346.2	634.6		634.6	877.0		877.0	2017.2		2017.2
Operating Expenses															
Crew Wages	-	25.8	25.8	-	70.4	70.4	-	129.0	129.0	-	178.3	178.3	-	403.5	403.5
Bunker Fuel	5.6	5.6	11.2	17.9	17.9	35.8	32.7	32.7	65.4	45.3	45.3	90.5	101.5	101.5	202.9
Port Fuel	3.8	3.8	7.6	8.6	8.6	17.2	15.8	15.8	31.6	21.9	21.9	43.8	50.1	50.1	100.2
Provisions & Water	2.1	2.1	4.2	5.9	5.9	11.8	10.7	10.7	21.4	14.8	14.8	29.6	33.5	33.5	67.0
Repairs and Maintenance	-	4.3	4.3	-	11.7	11.7	-	21.5	21.5	-	29.6	29.6	-	67.1	67.1
Stevedoring	13.4	13.4	26.8	42.6	42.6	85.2	78.1	78.1	156.2	107.9	107.9	215.9	242.0	242.0	484.1
Port Dues and Pilotage	2.9	2.9	5.8	9.1	9.1	18.2	16.7	16.7	33.4	23.1	23.1	46.2	51.8	51.8	103.6
Insurance	-	2.6	2.6	-	7.0	7.0	-	12.9	12.9	-	17.8	17.8	-	40.3	40.3
Depreciation	-	12.4	12.4	-	33.8	33.8	-	61.9	61.9	-	85.5	85.5	-	193.6	193.6
Total Operating Expenses	27.9	73.0	100.9	84.1	206.9	291.0	154.1	379.4	533.5	213.0	524.2	737.2	479.1	1183.5	1662.0
Operating Profit	131.5	-73.0	58.5	262.1	-206.9	55.2	480.5	-379.4	101.1	664.0	-524.2	139.8	1538.1	-1183.5	354.6
Other Expenses															
Administration		1.0	1.0		1.5	1.5		2.0	2.0		2.4	2.4		6.9	6.9
Interest															
Total Other Expenses		1.0	1.0		1.5	1.5		2.0	2.0		2.4	2.4		6.9	6.9
Profit Before Tax	131.5	- 74.0	57.5	262.1	- 208.4	53.7	480.5	-381.4	99.1	664.0	- 526.6	137.4	1538.1	-1190.4	347.7
Tax			37.6			35.0			65.1			90.2			227.9
Profit after Tax			19.9			18.7			34.0			47.2			119.8

Source: Consultants' estimates.

Navigation Company. These analyses are based on the assumptions discussed above. Although the projections show before-tax profits decreasing from approximately 50 percent of operating revenues to approximately 18 percent in 1985 and subsequent years, it must be remembered that this still-satisfactory return is based on the assumption of eliminated port congestion and associated surcharges and the pessimistic assumption of empty northbound voyages. Even on this conservative basis, the Syrian Navigation Company, in terms of net present value, shows a financial benefit to cost ratio of 1.387 over the next 20 years, and the ratio for the Syrian-Jordanian Navigation Company is 1.535.

The financial profitability analysis for the two companies in Tables D-1.2 through D-1.5 shows that they will be highly profitable operations. From 1981 to 1985, the two companies have projected combined profits of SP 169 million before taxes and SP 58 million after taxes. The comparable figures for the period 1981-2000 are SP 787 million and SP 271 million, respectively.

This is supported by the financial availability analysis shown in Tables D-1.6 through D-1.9. Over the period 1981-2000, the Syrian Navigation Company can finance all but SP 79.7 million of a recommended investment of SP 427.5 million from internally generated funds. The Syrian-Jordanian Navigation Company can finance all but SP 44.7 million of the recommended investment of SP 360 million over the same period. Both companies will require high subsidies in the early years, which will be partly offset by surplus funds available toward the end of the period. These subsidies from the general Government budget are only 24 percent of the income taxes that the Government can expect to collect over the 20-year period.

Economic Analysis

Based on the same assumptions used in the financial viability analysis, the economic analysis shows the following very high rates of return:

	Purchase in 1982	Purchase in 1985
Net Present Value (million SP)	18.8 SP	7.3 SP
Benefit Cost Ratio	1.837	1.324
Economic Rate of Return	.410	.181

Table D-1.6

SYRIAN NAVIGATION CO.

FINANCIAL PLAN 1981-1985

(SP 000)

	1981	1982	1983	1984	1985	Total
INVESTMENTS						
Additional Ships	—	22,500	22,500	22,500	22,500	90,000
FUNDS AVAILABLE						
Internally Generated[1]	10,325	12,784	11,633	10,447	8,035	53,224
Scrap Old Ships	—	—	—	—	—	—
TOTAL FUNDS AVAILABLE	10,325	12,784	11,633	10,447	8,035	53,224
ANNUAL EXCESS/DEFICIT	10,325	-9,726	-10,867	-12,053	-14,465	-36,776
CUMULATIVE EXCESS/ DEFICIT	10,325	609	-10,258	-22,311	-36,776	-36,776

Source: Consultants' estimates.

[1] After tax.

Table D-1.7

SYRIAN NAVIGATION COMPANY

FINANCIAL PLAN 1981-2000

	1981-1985			1986-1990			1991-1995			1996-2000			Total		
	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total
. Investment Additional Ships	90.0		90.0	112.5		112.5	112.5		112.5	112.5		112.5	427.5		427.5
. Funds Available Internally Generated[1]	242.5	-190.3	52.2	356.0	-2932	- 62.8	513.2	-419.2	94.0	722.9	- 587.0	135.9	1834.6	-1489.7	344.9
Scrap Old Ships	1.0		1.0	1.0		1.0			1.0				3.0		3.0
. Total Funds Available	243.5	-190.3	53.2	357.0	-293.2	- 63.8	514.2	-419.2	95.0	722.9	- 587.0	135.9	1837.6	-1489.7	347.9
. Excess/ Deficit	153.5	-190.3	-36.8	244.5	-293.2	- 48.7	401.7	-419.2	- 17.5	610.4	- 587.0	23.4	1410.1	-1489.7	- 79.7
. Cumulative Excess/ Deficit	153.5	-190.3	-36.8	397.9	-483.5	- 85.6	799.6	-902.7	-103.1	1410.0	-1489.7	- 79.7	-	-	-

Source: Consultants' estimates.

Note: Fo.Ex. = Foreign exchange / Lo.Cu. = Local currency.

[1] After tax.

Table D-1.8

SYRIAN-JORDANIAN NAVIGATION CO.

FINANCIAL PLAN 1981-1985

(SP 000)

	1981	1982	1983	1984	1985	Total
INVESTMENTS						
Additional Ships	—	—	—	—	22,500	22,500
FUNDS AVAILABLE						
Internally Generated[1]	8,043	7,429	6,471	5,160	5,269	32,372
Scrap Old Ships						
TOTAL FUNDS AVAILABLE	8,043	7,429	6,471	5,160	5,269	32,372
ANNUAL EXCESS/DEFICIT	8,043	7,429	6,471	5,160	-17,231	9,872
CUMULATIVE EXCESS/ DEFICIT	8,043	15,472	21,943	27,103	9,872	—

Source: Consultants' estimates.

After tax.

Table D-1.9

SYRIAN-JORDANIAN NAVIGATION CO.

FINANCIAL PLAN 1981-2000

(SP millions)

	1981-1985			1986-1990			1991-1995			1996-2000			Total		
	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total	Fo.Ex.	Lo.Cu.	Total
. Investments additional Ships	22.5		22.5	112.5		112.5	112.5		112.5	112.5		112.5	360.0		360.0
. Funds Available Internally Generated[1]	131.5	-99.2	32.3	262.1	-209.7	52.4	480.5	-384.5	96.0	664.0	- 531.4	132.6	1538.1	-1224.8	313.3
Scrap Old Ships										2.0		2.0	2.0		2.0
. Total Funds Available	131.5	-99.2	32.3	262.1	-209.7	52.4	480.5	-384.5	96.0	666.0	- 531.4	134.6	1540.1	-1224.8	315.3
. Excess/ Deficit	109.0	-99.2	9.8	149.6	-209.7	- 60.1	368.0	-384.5	- 16.5	553.5	- 531.4	22.1	1180.1	-1224.8	- 44.7
. Cumulative Ex/Deficit	109.0	-99.2	9.8	258.6	-308.9	- 50.3	626.6	-693.4	- 66.8	1180.1	-1224.8	- 44.7			

Source: Consultants' estimates.

Note: FO.EX. = Foreign exchange / Lo.Cu. = Local currency.

1 After tax.

As with the financial analysis, the economic analysis for a ship purchased in 1982 is biased by the present congestion surcharge. For this reason, the return on the ship purchased in 1985 is a more realistic indicator of the economic viability of the purchase of a ship.

D-1.7 CREW REQUIREMENTS

Available Crews

Unfortunately, the nucleus of trained Syrian personnel available to the Syrian Merchant Fleet is very small in almost all branches of the maritime profession, from ships' masters to qualified able seamen. The Register of Ships and Personnel, which is kept by the Port Affairs Department of the General Directorate of Ports, Lattakia, indicates that between 1960 and 1980, only 36 fully qualified masters' certificates were registered, as were 24 chief engineers, 24 able seamen, and 47 ordinary seamen. However, the Port Affairs Department indicated that there is an unspecified number of qualified Syrian officers and staff of all grades for whom they have no records. These people are working abroad in a variety of foreign flag ships, attracted by the higher wages and better working conditions offered by foreign companies.

A concerted effort should be made to locate and attract back as many of these personnel as possible. This may involve a review and revision of local pay scales. The crew and training analysis below does not assume that any of these personnel are attracted back, since there is no basis for forecasting how many might return. To the extent that such personnel can be hired, they will reduce requirements for temporary employment of expatriate personnel and might thus reduce costs somewhat. They would not affect the training plan since the trainees would be needed for future ships in any case.

Manpower Requirements for Ships Officers

The acquisition of the proposed new 35 ship merchant fleet poses important expatriate officer recruiting and Syrian[1] cadet training problems, the objective being to have a fleet fully staffed by qualified local personnel as soon as feasible. The complement of officers required for each ship is:

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[1] The term "Syrian" is used here, although some of the cadets for the Syrian-Jordanian fleet would presumably be Jordanians.

Above Deck	Below Deck
- Captain (1st Class Master)	- Chief Engineer
- Chief Officer (1st Class Master)	- 2nd Engineer
- 2nd Officer (1st Mate)	- Electrical Engineer
- 3rd Officer (2nd Mate)	- 3rd Engineer

Expatriate officers will have to be contracted to operate the new ships until Syrian cadets can be trained to replace them. In summary, the typical career path of a Syrian cadet (above deck or below deck) is as follows:

- 3 years sea and school to replace an expatriate 3rd officer or 3rd engineer,

- 6 years sea and school to replace an expatriate 2nd officer, 2nd engineer, or electrical engineer,

- 9 years sea and school to replace an expatriate chief officer or chief engineer, and

- 11 years sea and school to replace an expatriate captain.

Figure D-1.1 shows a cadet's typical career path and an example of the timing and phasing of expatriates and Syrians for the officer complement of a typical ship. Table D-1.10 shows expatriate and Syrian staff requirements for the first five ships proposed for purchase in the 5th Five-Year Plan. Table D-1.11 and Figure D-1.2 present estimated costs and phasing, respectively, of the required expatriate officers for the first five ships.

Syria and Jordan will not fully benefit from the new fleets until they are fully staffed by local officers. It is therefore important to determine as soon as possible the best way to train these officers. Three major alternatives exist:

1) Complete the Marine College at Lattakia and send cadets there.

2) Send cadets to the Arab League Marine Academy at Dubai.

3) Send cadets to Great Britain or another European maritime country.

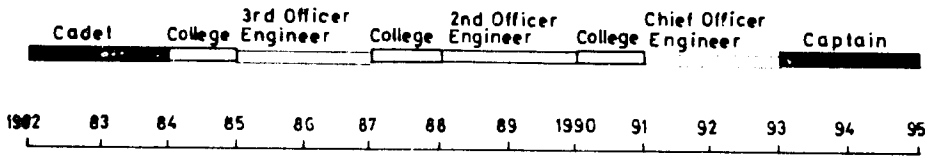
In the near term, alternatives 2 or 3 will have to be followed because of the lead time that will be required to establish a maritime college, if it is found feasible. Before a decision is made on the maritime college, however, the Consultants recommend that a full feasibility study be made. The financial and economic analyses presented earlier justify the acquisition of the recommended maritime fleet of 35 ships by the year 2000. The case for a maritime college is much less clear.

If the proposed fleet expansion is accepted, the number of maritime officer cadets will be 20 cadets per year. (This assumes a 25 percent loss during training. This loss factor may be high, but lower losses can readily be adjusted for in a program of steady expansion. The minimum number of cadets in college each year would be 16, assuming no training losses.) In addition, there would be eight officers of various ranks in training. The Consultants question whether this is an adequate student base for a maritime college. Moreover, the instructor staff for such a college would siphon off officers needed for the expanding merchant fleet. Because of this, the Consultants recommend that a full-scale feasibility study be made of the need for a Syrian maritime college before a decision is made to establish it. The study should take into consideration potential student loads, instructor availability, and costs of alternative training.

FIGURE D-1.1

MERCHANT FLEET MANNING

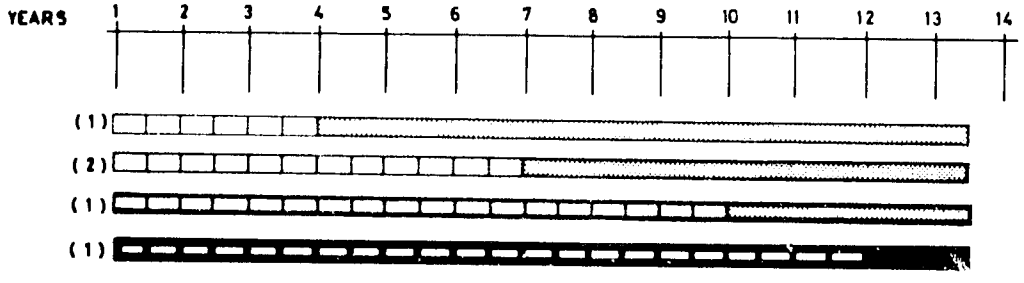
- TYPICAL CADET CAREER PATH



Notes:

- Career Path for above deck Officers & below deck Engineers is essentially the same.
- 3rd Officer has 2nd mates certificate; 2nd Officer has 1st mates certificate; and Chief Officer has 1st Masters Certificate

- MANNING SCHEDULE OF EXPATRIATE & SYRIAN OFFICERS FOR TYPICAL NEW SHIP.



LEGEND

EXPATRIATES

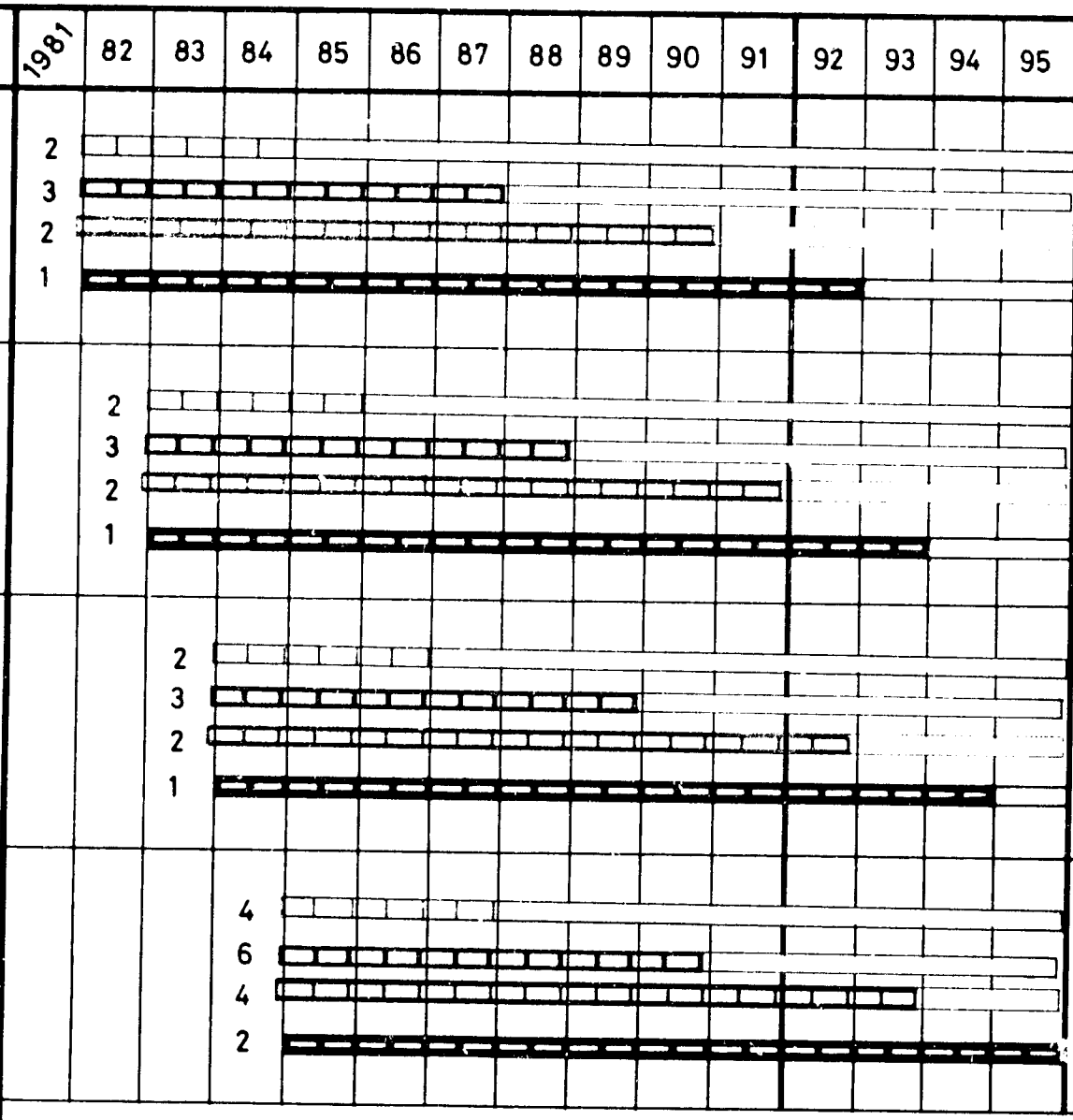
- 3rd Officer/Engineer
- 2nd Officer/Engineer
- Chief Officer/Engineer
- Captain

SYRIANS

- Cadet
- 3rd Officer/Engineer
- 2nd Officer/Engineer & Electrical Engineer
- Chief Officer/Engineer with 1st Class Masters
- Captain (1st Class Master)
- Periods of 1 year at Marine College

FIGURE D-1.2

MANNING CHART
EXPATRIATE OFFICERS FOR FIRST 5 SHIPS



EXPATRIATE REQUIREMENTS	1981	82	83	84	85	86	87	88	89	90	91	92	93	94	95
ANNUAL REQUIREMENTS		2	4	6	8	6	4								
		3	6	9	15	15	15	12	9	6					
		2	4	6	10	10	10	10	10	10	8	6	4		
		1	2	3	5	5	5	5	5	5	5	5	4	3	2
CUMULATIVE MAN YEARS		8	16	24	38	36	34	27	24	21	13	11	8	3	2

GRAND TOTAL MANYEARS 265

LEGEND

- 3rd Officer/Engineer
- 2nd Officer/Engineer & Electrical Engineer
- Chief Officer/Engineer (1st Class Master)
- Captain (1st Class Master)

Table D-1.10

EXPATRIATE & SYRIAN SHIPS OFFICER REQUIREMENTS

FIRST FIVE SHIPS

(Man years)

Officer	1982	83	84	85	86	87	88	89	90	91	92	93	94	95	96	Total Man Years
CAPTAIN																
Expatriate																
Annual	1	2	3	5	5	5	5	5	5	5	5	4	3	2		
Cumulative	1	3	6	11	16	21	26	31	36	41	46	50	53	55	-	55
Syrian																
Annual	-	-	-	-	-	-	-	-	-	-	-	1	2	3	5	
Cumulative	-	-	-	-	-	-	-	-	-	-	-	1	3	6	11	11
CHIEF OFFICER ENGINEER																
Expatriate																
Annual	2	4	6	10	10	10	10	10	10	8	6	4	0	0		
Cumulative	2	6	12	22	32	42	52	62	77	80	86	90	-	-		90
Syrian																
Annual	-	-	-	-	-	-	-	-	-	2	4	6	10	10	10	
Cumulative	-	-	-	-	-	-	-	-	-	2	6	12	22	32	42	42
2ND OFFICER ENGINEER																
Expatriate																
Annual	2	4	6	10	10	10	8	6	4	0	0	0	0	0	-	
Cumulative	2	6	12	22	32	42	50	56	60	-	-	-	-	-	-	60
Syrian																
Annual	-	-	-	-	-		2	4	6	10	10	10	10	10	10	
Cumulative	-	-	-	-	-	-	2	6	12	22	32	42	52	62	72	72
ELECTRICAL ENGINEER																
Expatriate																
Annual	1	2	3	5	5	5	4	3	2	0	0	0	0	0	-	30
Cumulative	1	3	6	11	16	21	25	28	29	30	-	-	-	-	-	
Syrian																
Annual	-	-	-	-	-	-	1	2	3	5	5	5	5	5	5	
Cumulative	-	-	-	-	-	-	1	3	6	11	16	21	26	31	36	36
3RD OFFICER ENGINEER																
Expatriate																
Annual	2	4	6	8	6	4	0	0	0	0	0	0	0	0	0	
Cumulative	2	6	12	20	26	30	-	-	-	-	-	-	-	-	-	30
Syrian																
Annual	-	-	-	1	2	4	6	10	10	10	10	10	10	10	20	
Cumulative	-	-	-		3	7	13	23	33	43	53	63	73	83	93	93

Source: Consultant's estimates.

Table D-1.11

COST ESTIMATE FOR EXPATRIATE OFFICERS/ENGINEERS

First Ten Ships

Title	No. Man Years	SP/Man Year	Total Cost SP[1]
Captain	55	284,700	15,658,000
Chief Officer	45	249,113	11,210,000
Chief Engineer	45	249,113	11,210,000
2nd Officer	30	213,525	6,406,000
2nd Engineer	30	213,525	6,406,000
Electrical Engineer	30	213,525	6,406,000
3rd Officer	30	199,290	5,979,000
3rd Engineer	30	199,290	5,979,000
	Grand Total		69,254,000

Source: Consultants' estimates.

[1] Used SP=3.90 U. S. Dollars, rounded to nearest 100.