

CHAPTER 9 COST ESTIMATE

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9.1 Basis of Cost Estimate

(1) Unit Rates and Prices

The unit rates and prices for labor, materials, plant and equipment are estimated based on the current price of July 2002.

(2) Exchange Rate

The exchange rate used in the estimates is :

1 US\$ = JY 120.00

and 1 US\$ = ₡ 8.75

(3) Price Escalation

The price escalation factor between the time of preparation of this estimate and the project implementation period is estimated based on the monthly indexes of direct construction costs issued by the Central Bank of El Salvador. Using the index data between January 1999 and March 2002, future escalation of the next two years is projected at 2%. This percentage is applied for the local currency portion, while no price escalation is applied for the foreign currency portion considering economic indices of the international market.

9.2 Cost Components

9.2.1 Division of Currency Portions

(1) Local Currency Portion

The local currency portion includes the following items:

- a) The costs of local materials, equipment and labor incorporated into both permanent and temporary works of the Project.
- b) The costs of local transportation, custom clearance, dealer's commission, handling charge of shipping agents, temporary storage, etc.
- c) The Contractor's overhead and profit to be charged in local currency portion.

(2) Foreign Currency Portion

The foreign currency portion includes the following items:

- a) The costs of materials, equipment and expatriate personnel to be procured abroad.
- b) The costs of transportation of import materials and equipment.
- c) The Contractor's overhead and profit to be charged in foreign currency portion.

9.2.2 Taxes and Duties

According to the law and regulations of the Republic of El Salvador, contractors providing goods and services under public contracts are subject to payment of various kind of local taxes and duties, such as IVA (Impuesto al Valor Agregado), business income tax, municipal tax and custom duty. In the case of Japanese ODA-financed

contracts, however, Japanese contractors are exempted from taxation according to mutual agreement between the Government of Japan and the Government of El Salvador. To ensure fairness to all bidders for the La Union Port Development Project, CEPA will arrange with tax authority concerned for the exemption or reimbursement of taxes and duties to the contractors or manufacturers involved in the Project. Since this matter is still pending, taxes and duties are not taken into account in the cost estimate.

9.2.3 Unit Rates

The costs of local materials and labor available at the site such as stone, gravel, reclamation material, cement, skilled labor, skilled operators, etc. are investigated through interview and quotations from local suppliers as well as government authorities concerned.

In general, large scale machinery, plant and equipment are not available in the country especially the marine floating equipment. Hence, such large scale machinery, plant and equipment are considered to be imported from third countries and their mobilization/demobilization costs are considered in the cost estimate.

In the unit rate analysis, estimated costs or unit rates applied for the projects being implemented in the country and current prices of international contracts are referred to in the cost estimate.

9.2.4 Physical Contingency and Provisional Sums

Physical contingency is allocated at 7 % of the base cost of the Civil and Building Works Package. Provisional sums are estimated at 350,000US\$.

9.3 Project Cost

9.3.1 Estimated Cost for Package A Civil and Building Works

The cost for the Package A : Civil and Building Works is estimated at 90.9 million US\$ as shown in Table 9.3.2, which consists a Foreign Currency Portion of 38.2 million US\$ and a Local Currency Portion of 52.7 million US\$.

9.3.2 Estimated Cost for Package B Procurement of Cargo Handling Equipment

The cost for the procurement of two quayside gantry cranes is estimated at 12.8 million US\$ as shown in Table 9.3.3.

9.3.3 Estimated Cost for Package C Procurement of Floating Equipment

The cost for the procurement of two tugboats is estimated at 7.0 million US\$ as shown in Table 9.3.4.

9.3.4 Estimated Cost for Consultancy Services

The cost for the procurement of consultancy services is estimated at 5.7 million US\$.

9.3.5 Total Project Cost

The total Project Cost is estimated at 116.3 million US\$, consisting of a Foreign Currency Portion of 63.6 million US\$ and a Local Currency Portion of 52.7 million US\$. The total amount of JBIC Loan available for the Project is 11,233 million Yen, while the total amount required to be financed from the Loan is 11,227 million Yen, that means there is a surplus of 6 million Yen.

Table 9.3.1 Total Project Cost

(Unit : 1,000 US\$)

Description	F/C Portion	L/C Portion	Total	Amount of JBIC Loan	% of JBIC Finance
1. Civil and Building Works	38,200 (4,584)	52,655 (6,319)	US\$ 90,855 (Y 10,903)	US\$ 68,141 (Y 8,177)	75 %
2. Procurement of Cargo Handling Equipment	12,766 (1,532)	0 (0)	US\$ 12,766 (Y 1,532)	US\$ 12,766 (Y 1,532)	100 %
3. Procurement of Tugboats	7,000 (840)	0 (0)	US\$ 7,000 (Y 840)	US\$ 7,000 (Y 840)	100 %
4. Consulting Services	5,650 (678)	0 (0)	US\$ 5,650 (Y 678)	US\$ 5,650 (Y 678)	100 %
5. Grand Total	63,616 (7,634)	52,655 (6,319)	US\$ 116,271 (Y 13,953)	US\$ 93,557 (Y 11,227)	

Note : Figures in parentheses are equivalent Yen amounts (million) converted at the exchange rate 120 Yen = 1 US\$

Table 9.3.2 Estimated Cost for Civil and Building Works

US\$=¥120

Project Cost Component	Cost Estimated in JICA D/D		
	Total (VAT exclusive)		
	Foreign (USD)	Local (USD)	Total (USD)
100 GENERAL REQUIREMENT	3,065,529	2,435,333	5,500,862
1A Mobilization/Demobilization	2,614,201	781,756	3,395,957
1B Temporary Facilities	128,197	147,839	276,036
1C Facilities for Employer and Engineer	0	1,407,549	1,407,549
1D Demolition and Clearance of the Site	23,131	48,189	71,320
1E Provisional Sums	300,000	50,000	350,000
200 CIVIL WORKS	32,297,271	36,442,990	68,740,261
2A Dredging Work	21,683,098	7,760,203	29,443,301
2B Container Berth Work	3,747,614	8,481,501	12,229,115
2C Multi-purpose Berth Work	2,700,462	6,738,612	9,439,074
2D Passenger Berth Work	828,596	240,229	1,068,825
2E Revetment Work	595,043	3,006,285	3,601,328
2F Reclamation Work	1,214,400	3,491,400	4,705,800
2G Pavement Work	195,238	4,899,585	5,094,823
2H Drainage Work	114,089	1,745,136	1,859,225
2I Navigation Aids	1,218,208	26,880	1,245,088
2J Security Fence	522	53,159	53,681
300 BUILDING WORKS	31,736	4,130,667	4,162,403
3A Port Administration Building	9,111	1,425,686	1,434,797
3B Container Freight Station	8,666	1,005,863	1,014,529
3C Maintenance and Repair Shop	5,550	759,760	765,310
3D Container Terminal Gate	3,527	419,097	422,624
3E Multi-purpose Terminal Gate	2,945	293,410	296,355
3F Power Substation and Generator	1,937	226,851	228,788
400 UTILITY WORKS	306,347	5,298,058	5,604,405
4A Fire Fighting System	795	336,346	337,141
4B Water Supply System	939	659,916	660,855
4C Wastewater and Sewer System	77,947	380,564	458,511
4D Ventilation and Air-conditioning	0	374,562	374,562
4E Plumbing and Sanitary Appliances	0	36,793	36,793
4F Power Receiving Equipment	0	575,920	575,920
4G Emergency Power Generation Equipment	0	383,838	383,838
4H Power Distribution Equipment	0	1,191,960	1,191,960
4I Cabling and Piping	0	404,195	404,195
4J Area Lighting System and Power Outlet	0	384,440	384,440
4K Fire Alarm System	0	21,850	21,850
4L Telecommunication System	0	110,439	110,439
4M Electrical Work for Building	0	258,665	258,665
4N Miscellaneous Equipment	226,667	178,570	405,237
Total Civil and Building Works Package (A)	35,700,883	48,307,048	84,007,931
(1) Price Escalation [(B)Lc x 2%]	0	966,141	966,141
(2) Physical Contingency [(B) x7%]	2,499,062	3,381,493	5,880,555
Grand Total (Excluded IVA/TAX)	38,199,945	52,654,682	90,854,628

CHAPTER 10 PORT OPERATION AND MANAGEMENT

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10.1 Port Privatization Schemes

10.1.1 Review of the Government Policy of Privatization and Private Participation

(1) Background of the Policy

Currently, cargo handling services mainly comprising stevedoring, long shore operations and warehousing at the Acajutla Port are provided by CEPA as a public operator. Under policy of the privatization of all the sectors in El Salvador and the worldwide trend of privatization and private participation in cargo handling services within ports, the Government of El Salvador intends to unexceptionally introduce privatization and private participation into the Acajutla Port so as to convert the port from the so-called "operating port" into a so-called "landlord port". Currently (as of February 2002), a draft of the legal and institutional framework aiming to facilitate the incorporation of private sector into public ports is being worked out through the preparation of the drafts of two laws named "General Maritime and Port Law" and "Law of Port Concession". The study on the said matter was entrusted to USA consultants, the "Louis Berger Group Inc. and National Ports and Waterways Institute University of New Orleans", and they proposed a privatization scheme for public ports with the above-mentioned draft laws. The drafts are being finalized by the governmental authorities concerned before their submission to the Salvadorean Congress. If the laws are promulgated, they will be applied not only to the Acajutla Port but also to the Cutuco Port as a general rule. Although the laws are categorized as general law as so entitled, they obviously focus on the introduction of private operators into the Acajutla Port for the purpose of upgrading port service levels, increasing cargo handling productivity, and reducing real costs for port users.

Further study and discussion between CEPA and the JICA Study Team will be made to reach the final decision on the port operation and management system as well as concessionaire. Thus, only preliminary discussion is made in this Chapter.

(2) Outline of the Privatization Scheme by the "Louis Berger Group"

Two options are proposed in the privatization scheme; one is "partial concession" (terminalization) and the other is "total concession" (master concession). In the case of "partial concession", several operators would provide port services based on concessions granted from the government according to individual concession agreements. As to the functions of public authorities in the case of "partial concession", it is proposed to create a new regulatory agency named AMAP (Port and Maritime Administration) that will be independent from the current ministries including the Ministry of Public Works, Transportation, Housing and Urban Development and its

subordinate, the General Directorate of Maritime Transport, AMAP will have jurisdiction over CEPA and its leadership will be imposed of a chairman nominated by the President of the Republic, one Director by the Minister of Foreign Affairs, and two Directors nominated by the President of the Republic from the private sector based on the proposal by the National Association of Private Enterprises (ANEP). The proposed main functions of AMAP are to supervise concessions, including approval of port tariff and resolution of conflicts. The proposed reorganized functions of the General Directorate of Maritime Transport will be to prepare policies, national plans and technical standards for the port sector. In this option, the current organization and responsibilities of CEPA will be shrunk to a great extent, in which CEPA will be reorganized into several "Regional Port Authorities" such as that of the Acajutla Port. The proposed main functions of these Regional Port Authorities are to administrate concessionaires, to approve port tariff, to coordinate private operators, to invest in infrastructure, and to maintain port zones and infrastructures. Cargo-handling operations will be fully handed over to private operators that will be granted concessions to use designated and specified zones exclusively with each other. (see Figure 10.1.1).

On the other hand, in the case of "total concession", a unique operator would provide port services based on a concession granted by the government under a concession agreement. As to the functions of public authorities in the case of "total concession", it is proposed to create a new regulatory agency named AMAP same as in the case of "partial concession". The proposed main functions of AMAP are to supervise the concession, and to approve and supervise port tariff. In this option, the current organization and responsibilities of CEPA will be shrunk drastically, and CEPA will virtually disappear. The main functions of Regional Port Authorities in the case of "partial concession" will be handed over to AMAP, the General Directorate of Maritime Transport, and to the unique concessionaire. (see Figure 10.1.2)

Current governmental organizations relating to the port sector are shown for reference in Figures 10.1.3 to 10.1.5.

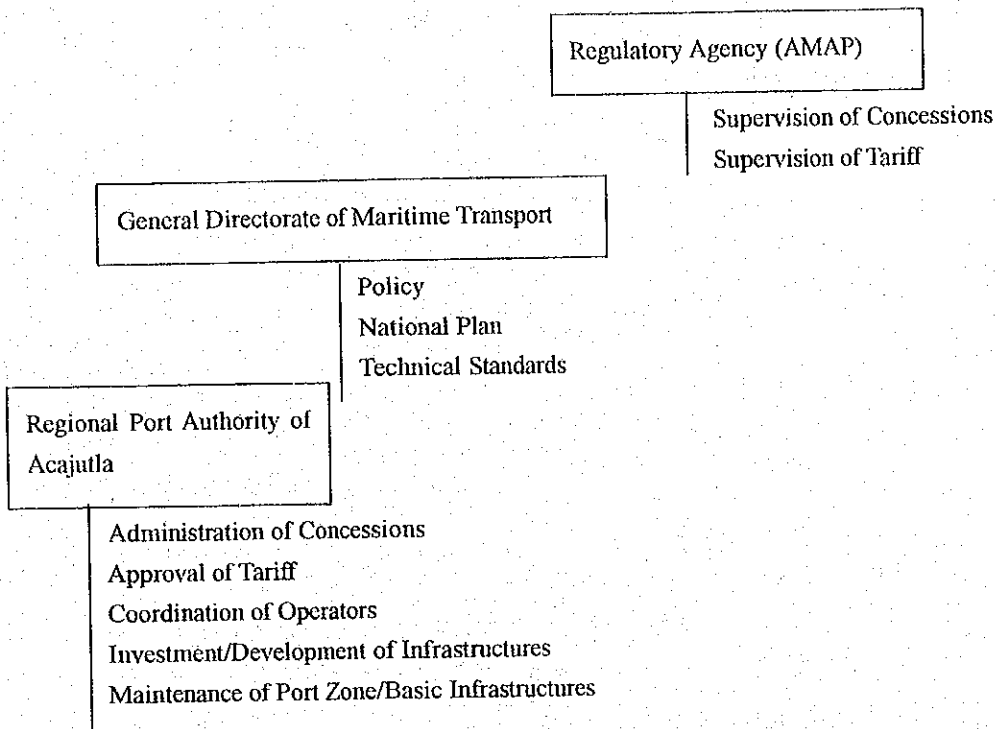


Figure 10.1.1 Functions of Public Entities under “Partial Concession” Scheme

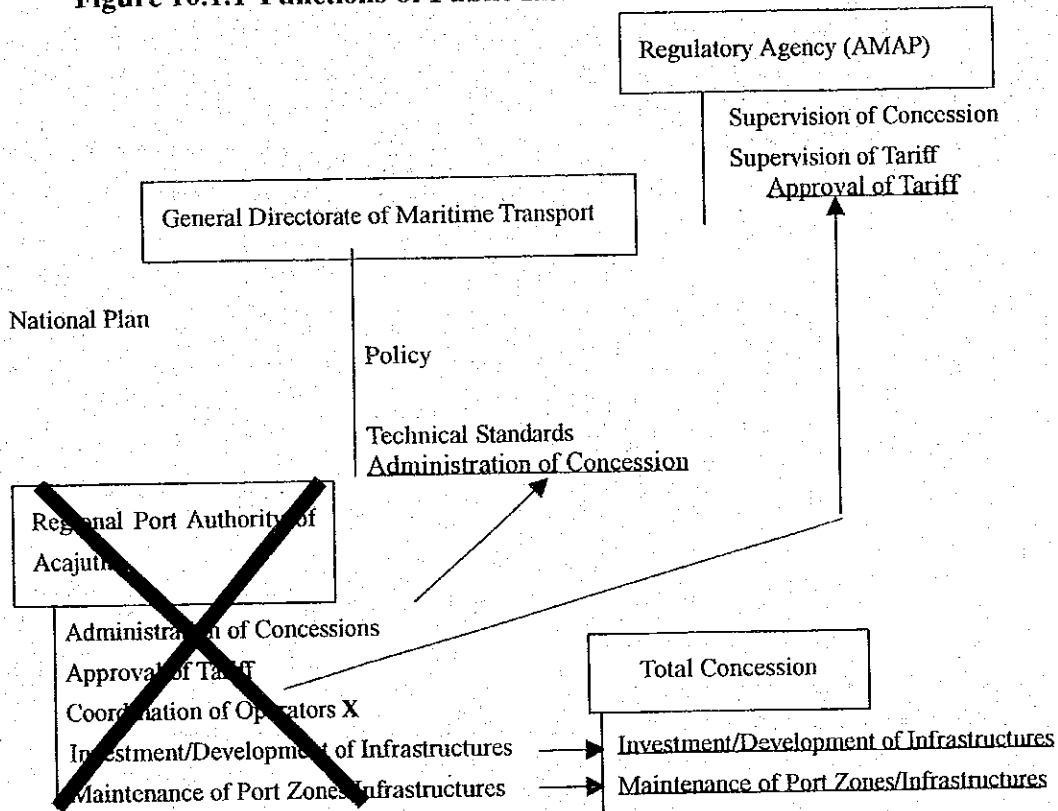
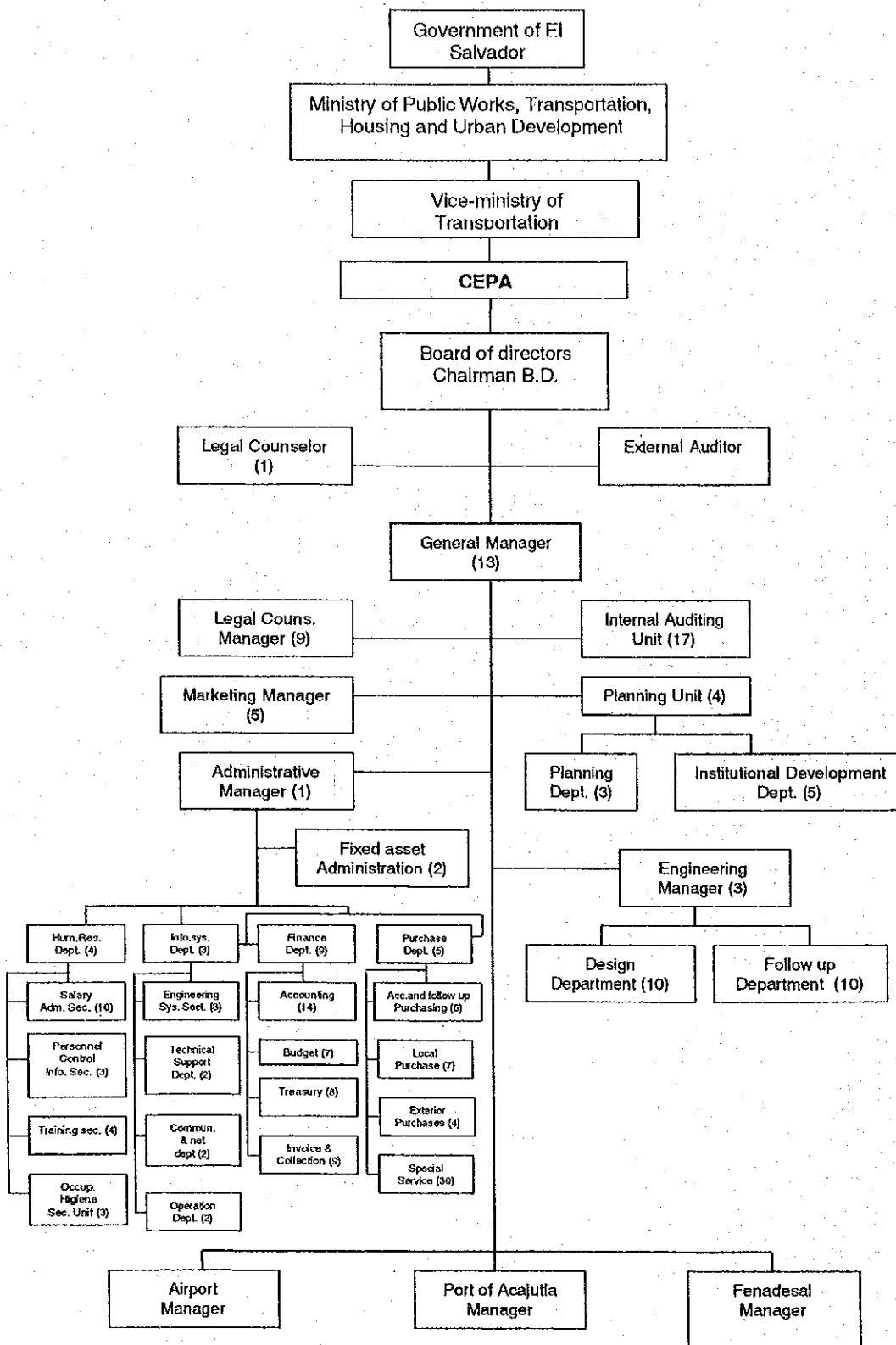


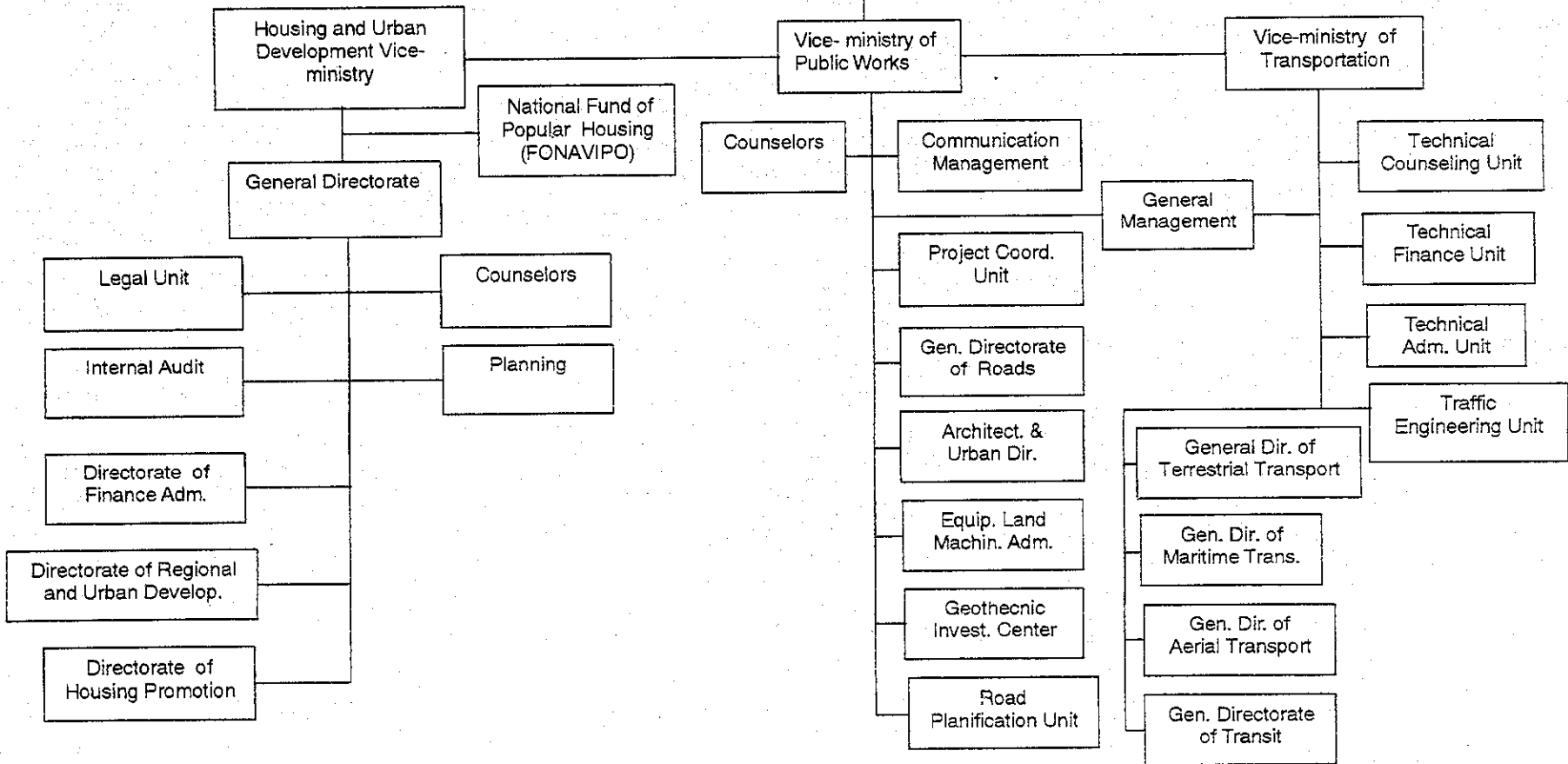
Figure 10.1.2 Functions of Public Entities under “Total Concession” Scheme



Note (): Number of Employee
Source: CEPA

Figure 10.13 Organization Chart of the COMISION EJECTIVA PORTUARIA AUTONOMA (CEPA)

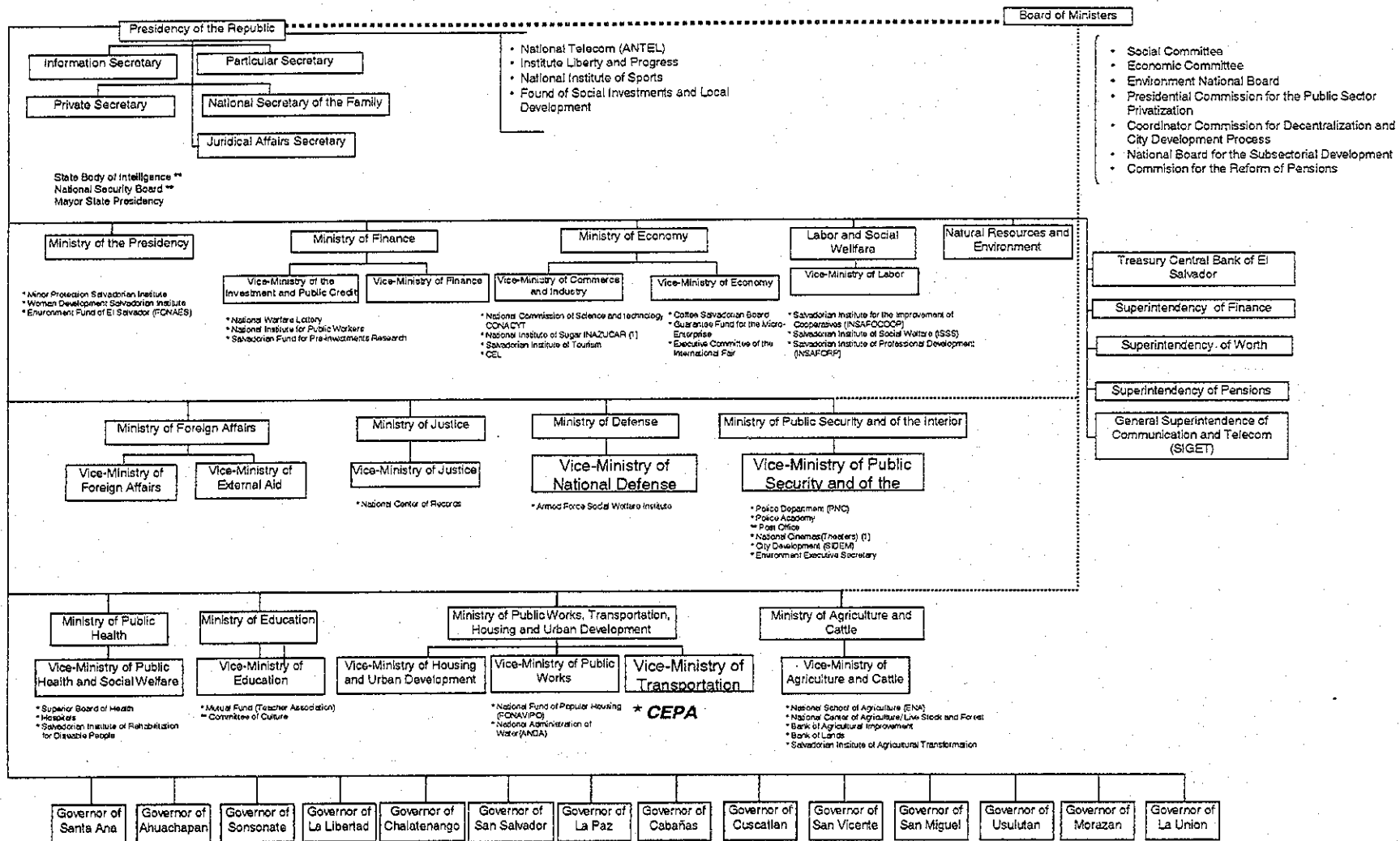
Ministry of Public Works, Transportation, Housing and Urban Development



10 - 5

Source: MOP

Figure 10.1.4 Organization Chart of MOP



* Autonomous Institution
 ** Are not Judicial Autonomous

(1) In Liquidation / Shell

Figure 10.15 Organization Chart of El Salvador Government

10.1.2 Institutional Framework in the Administration and Operations of Cutuco Port

(1) General

A public port is a vital economic infrastructure as it serves port users such as shipping lines and consignors/consignees (importers/ exporters) together with operators providing stevedoring, warehousing and forwarding services, as well as shipping agents/customs brokers. A public port is naturally a public property also known as state-owned property, and hence is administrated by a public entity that is so-called "port authority" and is granted authorization to administrate the port backed by a specific law and its corresponding regulations.

(2) Functions of Port Authority in the Case of "Landlord Port"

The public port is divided into two categories in provision of port services; One is so-called "landlord port" and the other "operating port". In the case of "landlord port", port services are solely provided by private operators based on a concession agreement signed with a public entity. On the other hand, in the case of "operating port", port services are provided by a port authority. In the former case, viz. "landlord port", the functions of the port authority are regulatory and administrative ones generally including:

- Administration of public property
- Development of basic infrastructures such as construction of breakwaters, access channels/basins, seawalls, quay walls port access roads, and land acquisition
- Maintenance of basic infrastructures for common use such as access channels and port access roads
- Navigational control of vessel traffic along access channels based on police powers
- Administration of port zone composed of waters and land
- Examination of tariff applied by concessionaires
- Monitoring of cargo-handling productivity
- Entering into concession agreement with concessionaires
- Preparation of port development plans on long-term and short-term basis in compliance with the national policy

(3) Functions of Private Operators in the Case of "Landlord Port"

On the other hand, the functions of private operators are generally as follows:

- Provision of port services
- Stevedoring services
- Warehousing services
- Forwarding services for port cargo
- Preparation of superstructures
- Cargo-handling machines such as shore cranes, yard cranes, forklifts, head-chassis units and forklift trucks
- Storages such as warehouses, silos and tanks

- Maintenance of basic infrastructures of the terminal surrendered contractually handed over to the concessionaire
- Application for tariff approval

(4) Functions of Port Authority in the Case of “Operating Port”

In the case of “operating port”, the functions of a port authority are regulatory and administrative ones the same as in the case of “landlord port”, and provision of port services instead of private operators in the case of “landlord port”. Currently the Acajutla Port is categorized as “operating port”, while it is expected to be converted into “landlord port” together with the Cutuco Port, in compliance with the government policy of promotion of privatization.

(5) Regulatory Agency

In the process of becoming a “landlord port”, it is foreseen that a mix of “landlord port” and “operating port” will operate as a transitional step in the privatization process, and port users, port authority and private operators will be triangularly involved in the activities of the port where there will be generally intricate interest among them, and are often faced with frequent conflicts between different parties or among the same party. To settle such possible conflicts from the standpoint of ensuring the public interests, a public agency so-called “regulatory agency” independent from the triangle relation, viz. port users, a port authority and private operators, is often required to be established. A “regulatory agency” which is expected to function as an arbiter without bias interest in the outcome, on one hand and to reflect opinions of private port users in port management by nominating their representative as a member of a “regulatory agency on the other hand. In this regard, it might come into question if a port authority itself as a sort of public entity could function as a “regulatory agency”, even in the case of “landlord port” where a port authority no longer provides port services but only functions as administrative and regulatory entity. In this regard, it is considered to be preferable to establish a “regulatory agency”, so as to reflect officially the opinions of private port users which are, often forced to be silent, and to preclude possible sectoral interests among public entities generally often found in view of the real public interests, though a “regulatory agency” is not inevitably necessary. The government intends to establish such “regulatory agency” by the name of “AMAP”. The functions of AMAP are listed bellow:

- Supervision of concessions
- Approval of tariff

(6) New Terminals of Cutuco Port as Property Subject to Concession

There will be three types of marine terminals at the La Unión Port. One is a dedicated container terminal; the second is a multi-purpose terminal where dry bulk cargoes such as cereals and fertilizer and break-bulk general cargoes such as bagged cement and

iron/steel products will be handled; an the third is a passenger berth where Ro-Ro are also expected to be served. Each terminal will have one berth and a back yard just behind the berth. Thus, they are terminals of so-called marginal type which are completely different from the old-fashioned Acajutla Port in configuration.

(7) Summarized Institutional Framework of Cutuco Port

From the above, the proposed institutional framework focused on the La Unión Port is summarized in Figure 10.1.6.

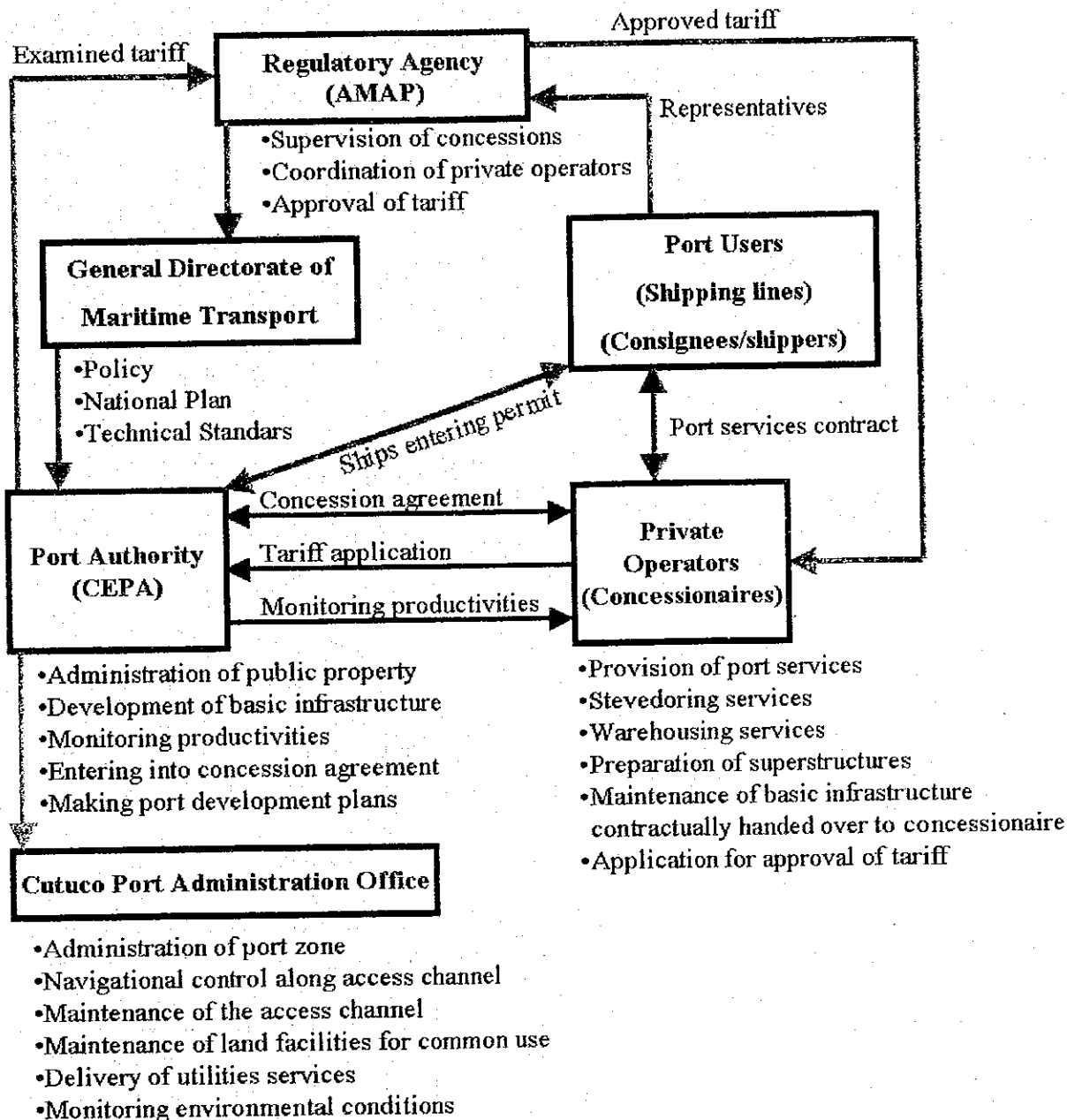


Figure 10.1.6 Institutional Framework of La Unión Port

(8) Suitable Number of Divisions in Concession

The container terminal and multi-purpose terminal at the La Unión Port are quite different in terms of potential private terminal operators and the extent of the necessity of direct control of stevedoring and warehousing (storing) operations within the port by consignees/shippers typically required in captive cargoes such as cereals, fertilizers and cement. Thus, it is recommended to separate the two terminals in granting concession to private operators from the first stage. In the following stages when berths are added to the container terminal, it is recommended to keep the container terminal as one terminal without division so as to keep competitiveness against other container terminals in neighboring countries in Central America. They will not be able to compete with other container terminal operator within the same port, viz. La Unión Port, if divided. In contrast, in the case of the multi-purpose terminal when berths will be added to the container terminal, it is recommended to split the terminal into two divisions or more in terms of concession for cargoes such as cereals if the volume are sufficiently large for exclusive use of one division split from the original terminal with one additional berth.

For the multi-purpose terminal, there are two alternative contract types for private operators. One is a type of “granting concession to manage a terminal” as referred above where a specified public property, namely a terminal in this case, is surrendered to a private concessionaire during a long-term contract period generally extending several decades, while “granting concession” does not mean shift of ownership from public to private one (“option 1”). The other is a type of “granting license to provide port services” such as stevedoring within a terminal administrated and maintained by a port authority, where any facilities are not surrendered or leased (“option 2”). In the latter option, the license period is generally short, one or several years at most.

The divisions of port areas in the cases of “option 1” and “option 2”, which will be partly surrendered to private concessionaires and partly kept without concession and administrated by Cutuco Port office as common use areas, are conceptually shown in Figures 10.1.7 and 10.1.8, respectively.

(9) Pilot and Tug Services

It is recommended to grant a private sector a license to provide pilot and tug services. Tugboats to be procured by CEPA could be leased to the licensee.

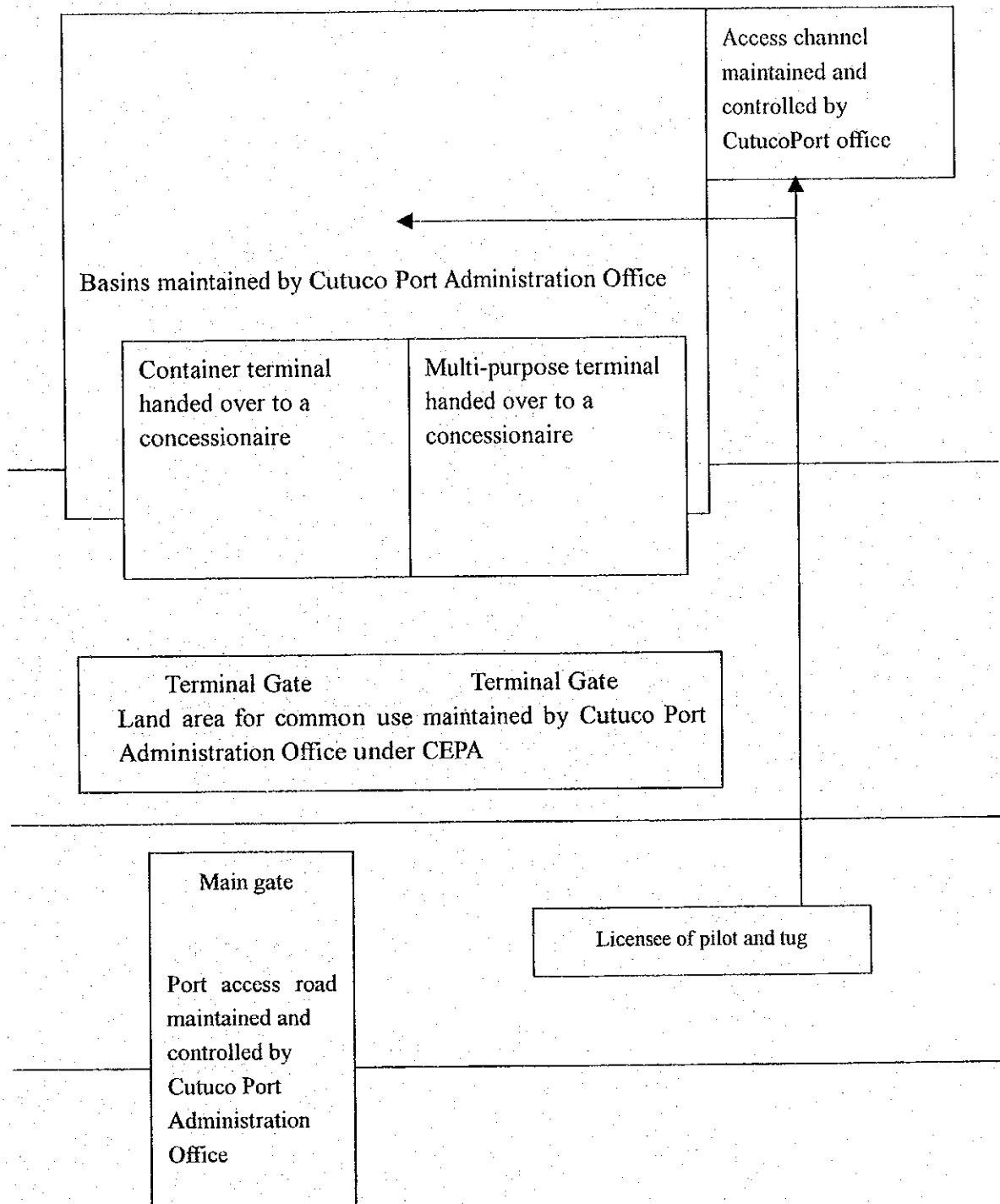


Figure 10.1.7 Areas Surrendered to Concessionaires and Maintained by Cutuco Port Office under CEPA (“Option 1”)

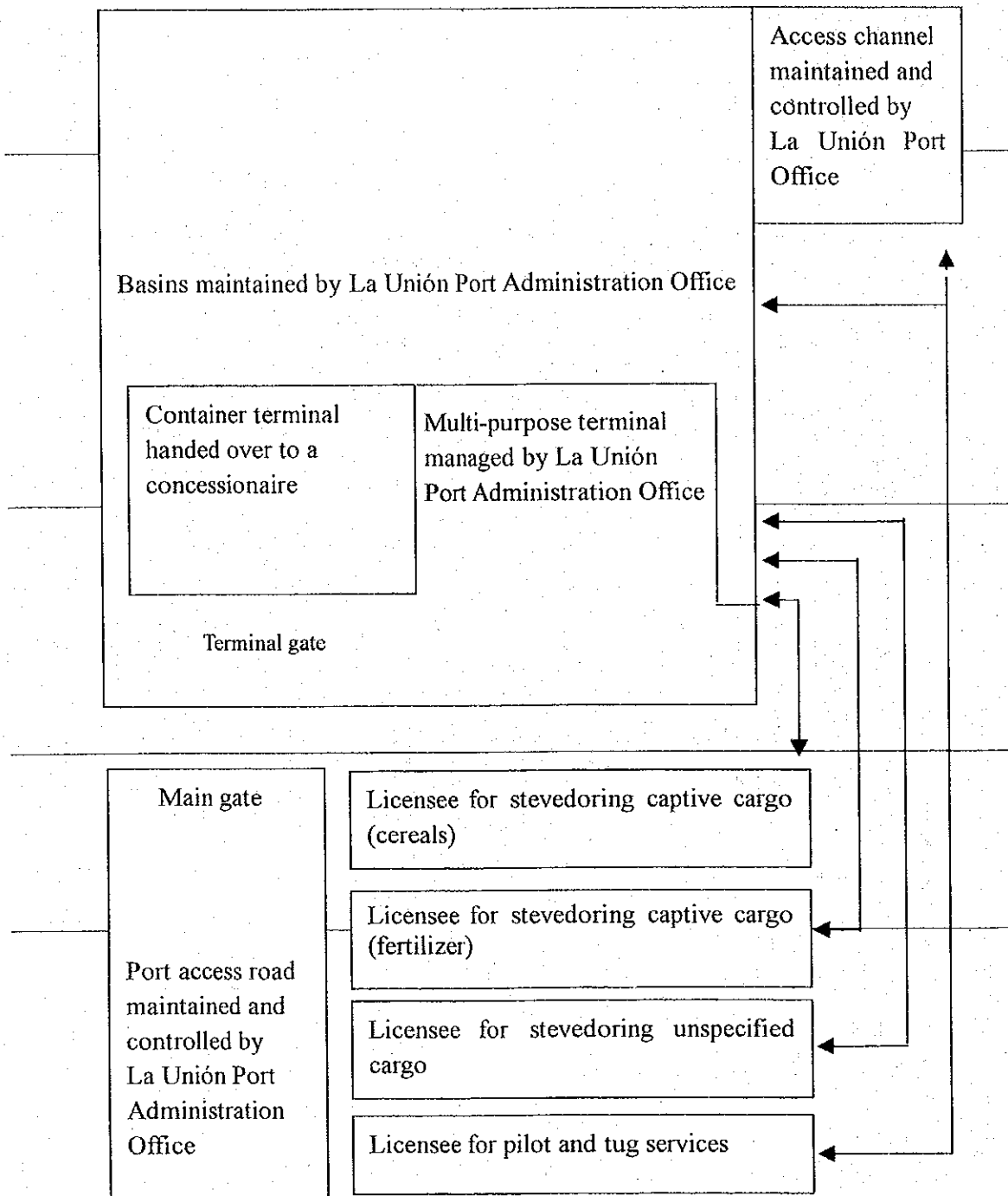


Figure 10.1.8 Areas Surrendered to Concessionaires and Maintained by La Unión Port Office under CEPA (“Option 2”)

10.2 Proposed Organization

10.2.1 Organization of La Unión Port Administration Office under CEPA

As previously proposed, the main functions of the La Unión Port Administration Office under CEPA are as follows:

- Administration of port zone
- Navigational control along the access channel
- Maintenance of the access channel
- Maintenance of land facilities for common use
- Delivery of utility services including water, electric power and telephone cables
- Monitoring environmental conditions

To fulfill the above functions, the following posts and departments in terms of office organization are considered to be necessary: (See Fig.10.2.1)

- Managing Director (1)
- Legal Advisor (1)
- Harbor Master (1)
- Navigation Controller (4)
- Administration Department (1)
 - General Affairs Section (2)
 - Finance Section (Port dues collection, Accounting, etc.) (2)
 - Concession/License Monitoring Section (2)
- Maintenance Department (1)
 - Civil Works Section (Access channel, Basin, Access road, etc.) (3)
 - Mechanical Section (1)
 - Electrical Section (2)
 - Environmental Monitoring Unit (1)
- Security Division (6)
- Fire Brigade (6)

In the organization listed above, figures in parentheses are the number of personnel totaling 34.

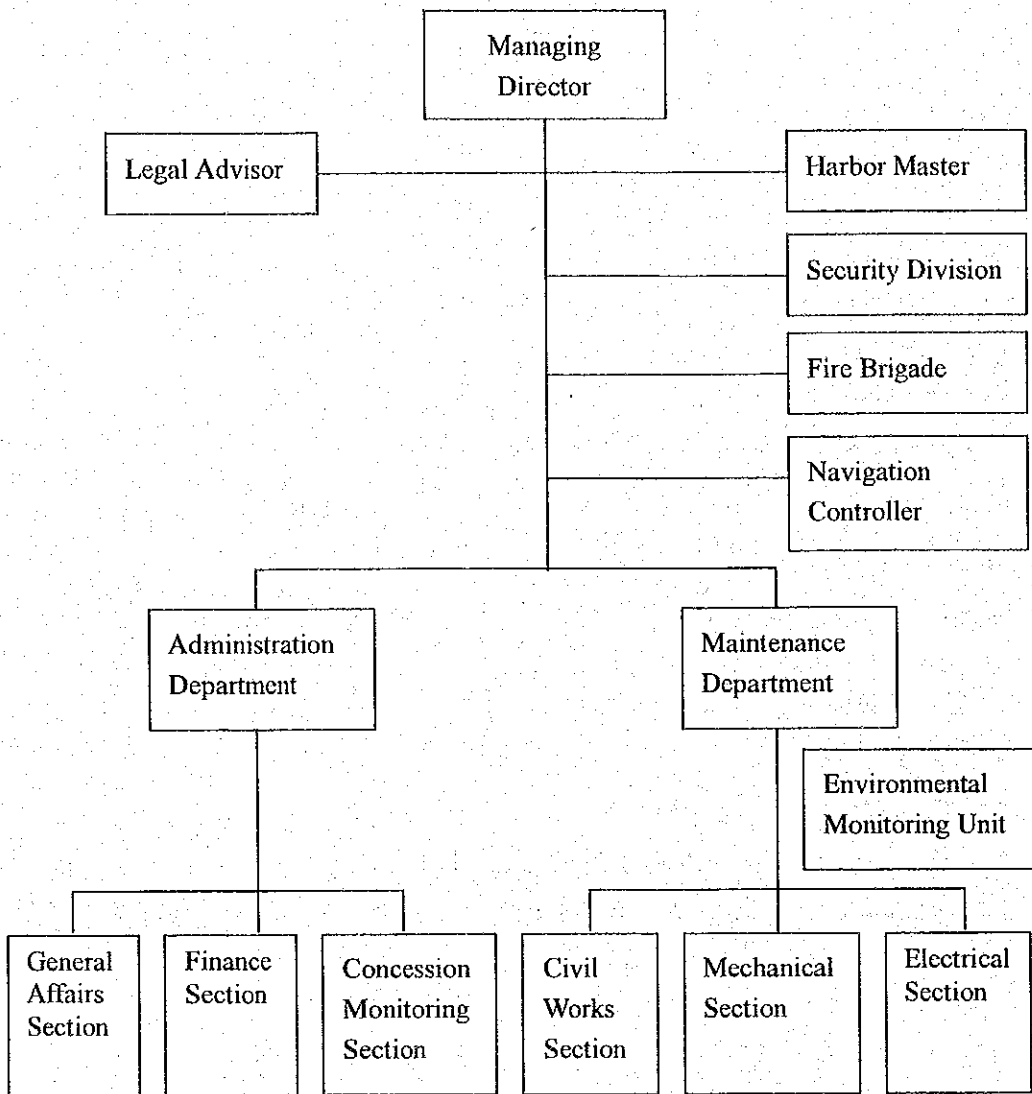


Figure 10.2.1 Organization Chart of La Unión Port Administration Office

10.2.2 Concession Agreement on Marine Terminals

(1) Terms of Concession Agreement

A concession agreement that is entered between a grantor (a government body) and a concessionaire (a private terminal operator) with regard to a marine terminal at a port generally includes the following terms as the minimum requirements:

- a) Definitions and Interpretation
- b) Term
The period from the date of ratification to expiration of the agreement
- c) Concession Period
The period from the date of handover of leased facilities (port infrastructure, superstructure and equipment) to expiration of the agreement (generally from 25 – 30 years)
- d) Obligation of the Concessionaire
To procure required equipment, maintain leased facilities in good conditions and achieve annual cargo throughput over a certain threshold stipulated in the agreement with satisfactory cargo-handling productivity
- e) Obligation of the Grantor
To grant a concessionaire an exclusive license to operate and manage leased facilities and own equipment
- f) Concession Fee
Generally concession fee is composed of lease fee portion and royalty fee portion; the former is paid for the lease of port facilities including land, and the latter for the exclusive license to operate and manage by using lease facilities. The amount of lease fee is basically fixed, though it is increased by a fixed annual inflation rate stipulated in the agreement. On the other hand, the royalty fee is further divided into two categories; one is fixed portion (inflation is considered) and the other is variable portion. The variable portion has two types: One is sharing of operator's profit after tax and with a certain deduction such as deduction equity dividends and yield on accumulated surplus fund in the preceding year base. The other is paid in proportion to the volume of cargo based on a unit price (for example expressed in terms of US\$/TEU) for excess volume over some stipulated threshold. There are also mixed types.
- g) Taxation
- h) Insurance
Generally, the concessionaire is required to keep necessary insurance, whereas a government is excluded from this requirement due to having so-called self-insurance disposition.

- i) Force Majeure
- j) Change of Law
- k) Default
- l) Termination of the Agreement
- m) Transfer
Concessionaire's facilities will be transferred to the grantor on the expiration date of the agreement
- n) Indemnity
It is stipulated for both the concessionaire and the grantor
- o) Accounting and Auditing
- p) Waiver
- q) Currency of Payment
- r) Confidentiality

(2) Container Terminal at La Unión Port

The determining factor in terms of financial soundness in container terminal management for both the grantor and the concessionaire is undoubtedly concession fee. In the case of the container terminal under the La Unión Port Project, the grantor is the Government of El Salvador and the concessionaire will be a private container terminal operator who will be awarded the exclusive right of management and operations within the said container terminal through ICB (international competitive bid). Although the amount of the fee will be determined through the negotiation of a contract between the two parties, it is considered to be necessary to cover the following costs by the lease fee on a fixed amount base in the rationale mentioned in "f"):

- a) Repayment of loan principal for the infrastructures (quaywall, yard, etc.) and equipment (container gantry cranes, etc.) to be handed over to the concessionaire and payment of corresponding loan interest
- b) Repayment of loan principal for capital dredging of the access channel and payment of corresponding loan interest (shared with the multi-purpose terminal)
- c) Expense for maintenance of dredging in basins and access channel (shared with the multi-purpose terminal)
- d) Expense for maintaining common land facilities such as the port access road (shared with the multi-purpose terminal)
- e) Expense for port administration including the Cutuco Port office of CEPA (shared with the multi-purpose terminal)

On the other hand, as to the royalty fee, the type and the amount will be determined based on anticipated financial statements on the said project. It might include on increasing variable portion (royalty portion). Moreover, it might be necessary to

reconsider the degree of sharing of the expense for the common facilities such as the construction and maintenance of the access channel and the access road, depending on the situation.

(3) Multi-purpose Terminal at La Unión Port

In the case of the multi-purpose terminal at the La Unión Port, the determining factor for concession in terms of financial soundness in the terminal management for both the grantor and the concessionaire is concession fee in the same way as the container terminal. The multi-purpose terminal management, however, is generally less profitable compared with the container terminal management. Hence, it might be necessary to reconsider the degree of sharing of the expense for the common facilities more seriously, depending on the situation.

In addition to "granting concession option" including the handover of infrastructures", there is another option of "granting operational licenses" comprising mainly stevedoring, warehousing and forwarding within designated port areas. The advantage of the license option is to enable plural private stevedoring companies to participate in the port business with ease at the La Unión Port, especially in the initial stage of the port development. Although "granting concession option" where one concessionaire operates exclusively within the multi-purpose terminal is recommendable, it might become necessary to consider "granting operational license option" as the second best, depending on the situation. In the latter option, the government will receive license fees instead of a concession fee and will need to maintain the infrastructures of the multi-purpose terminal on day-to day basis.

10.2.3 Pilot and Tug Services at La Unión Port

In compliance with the comprehensive privatization policy of the government in the maritime sector, it is recommended that pilot and tug services at the La Unión Port be provided by a private company specialized for the services. Tugboats are planned to be procured by CEPA, and it is advisable to lease out these boats to the company with a license for the said services granted by the government. Such services could be provided by one of the two terminal operators with the understanding that the services are provided to any ships without discrimination.

Navigation traffic needs to be controlled by the public authority with police power, namely CEPA.

10.2.4 Port Tariff

(1) General Tariff Structure

Although there are no worldwide common tariff structures, they could be divided into two major categories. The first is the cargo-handling charge that is paid mainly for stevedoring, and warehousing services in proportion to the cargo volume measured by

cargo unit and/or day such as MT or MT per day in conventional cargo and box or box per day in containers. The second is the vessel service charge that is paid mainly for pilot, tugboat, mooring and unmooring, and berthing services in proportion to vessel size measured by GRT, LOA etc. or to service times spent by port service boats.

In addition to the above two categories, port dues with the disposition of tax such as port entrance due and wharf age are often levied. The former is paid in proportion to vessel size and the latter to cargo volume passing through a port so as to cover maintenance expense for basic infrastructures such as breakwaters, access channels and port roads that are not covered by the cargo-handling and vessel service charges mentioned above.

(2) Tariff Setting

As to tariff setting apart from port dues with the disposition of tax mentioned above, there are two systems; one is official price setting and the other is pricing by private operators. The former tariff is generally set where a port authority provides cargo-handling services. On the other hand, as to the latter tariff, along with the worldwide progress of deregulation in the port sector, there is a trend that only tariff notification to a public authority is required instead of approval, though the public approval system still prevails worldwide.

(3) Current Tariff at Acajutla Port

At the Acajutla Port, the port authority, viz. CEPA, provides both cargo-handling services and vessel services, and CEPA decides port tariff as official tariff. The major components of the tariff are vessel service charge and cargo-handling charge. Port dues are not levied at the port; it is considered that they are included in vessel service charges. The current major tariff items are listed below:

- a) Vessel Service Charge
 - Mooring and unmooring: US\$ 0.37/GRT
 - Berthing: US\$ 3.43/m/day (LOA)
 - Navigational aids: US\$ 115.79/Vessel
- b) Cargo-handling charge for general cargo
 - Stevedorage (from vessel to wharf, vice versa):
 - Iron or steel products: US\$ 5.14/MT
 - General cargo: US\$ 8.58/MT
 - Vehicles: US\$ 21.38/MT
 - Haulage (from wharf alongside to yard or shed of CEPA):
 - Break-bulk (cases, cartons, pallets): US\$ 13.23/MT
 - Bags: US\$ 8.68/MT
 - Metal, ingots, rolls: US\$ 4.26/MT
 - Vehicles: US\$ 15.67/MT
 - Sugar in bag: US\$ 6.84/MT
 - Storage: US\$ 3.43/m (LOA)
 - First 5 days: US\$ 0.08/MT/day
 - 6 days – 15 days: US\$ 0.23/MT/day
 - Over 15 days: US\$ 0.47/MT/day
- c) Cargo-Handling Charge for Dry Bulk Cargo
 - Stevedorage
 - With belt conveyor: US\$ 1.50/MT
 - Without belt conveyor (unloading): US\$ 3.85/MT
 - Surcharge (according to cargo condition): US\$ 0.38/MT
 - Haulage:
 - With belt conveyor: US\$ 2.72/MT
 - With belt conveyor (sugar: CEPA shed): US\$ 3.82/MT
 - With belt conveyor (sugar: private shed): US\$ 2.28/MT
 - Without belt conveyors: US\$ 1.51/MT
 - Surcharge for Receive and Dispatch: US\$ 0.40/MT
- d) Container-handling charge
 - Stevedorage: US\$ 39.60/cont.
 - Haulage (from wharf to yard vice versa):
 - Laden (to shipping lines): US\$ 12.79/cont
 - Laden (to consignees/shippers): 5.56/MT
 - Empty: US\$ 19.40/cont
 - Lift-on/Lift-off: US\$ 16.43/cont.
 - Storage:
 - Dry: US\$ 1.20/TEU/day
 - Reefer: US\$ 20.10/TEU/day
 - Reefer: US\$ 30.00/2 TEUs/day.

- Haulage (from yard to CFS vice versa): US\$ 13.80/cont
- Stuffing or unstuffing: US\$ 3.60/ MT

(4) Current Tariff at Quetzal Port

The current major tariff items at Quetzal Port are listed below:

- a) Vessel Service Charge
 - Mooring/Unmooring (under 15,000 GRT): US\$ 0.42/GRT
 - Mooring/Unmooring (over 15,000 GRT): US\$ 6,300/vessel
 - Berthing: US\$ 0.15/m (LOA)/hr
 - Navigational aids: (under 15,000 GRT): US\$ 0.02/GRT
 - Navigational aids (over 15,000 GRT): US\$ 310/vessel
- b) Cargo-handling Charge for General Cargo
 - Stevedorage:
 - Rolled papers: US\$ 2.58/MT
 - Bagged cargo: US\$ 4.38/MT
 - General cargo (import): US\$ 3.45/MT
 - General cargo (export): US\$ 2.60/MT
 - Iron and steel products: US\$ 2.60/MT
 - Vehicles: US\$ 3.45/MT
 - Cargo-handling (indirect):
 - Rolled papers: US\$ 9.00/MT
 - Bagged cargo: US\$ 6.32/MT
 - General cargo (import): US\$ 6.32/MT
 - General cargo (export): US\$ 9.35/MT
 - Iron and steel products: US\$ 9.35/MT
 - Vehicles: US\$ 28.55/MT
- c) Cargo-handling charge for dry bulk cargo: US\$ 8.40/MT
- d) Container-handling charge
 - Stevedorage: US\$ 38.00/cont
 - Haulage: US\$ 18.00/cont
 - Lift-on/Lift-off: US\$ 14.00/cont
 - Wharfage: US\$ 66.00/cont

(5) Comparison of Tariff between Acajutla Port and Quetzal Port

As to container handling, the total charge from lift-off from road chassis at the container yard to loading onto a container ship in export and vice versa in import is US\$ 85.25 for aden container, (charged to shipping line) at the Acajutla Port. In the case of empty containers, the total charge is US\$ 91.86. On the other hand, the total charge from lift-off from road chassis at the container yard to loading onto a container ship in export and vice versa is US\$ 84.00 at the Quetzal Port. Thus, the difference between the two ports

in container-handling charge is small.

As to the handling of dry bulk cargo, the total charge comprising stevedorage and haulage is US\$ 5.36. Total charge including surcharge is said to be approximately US\$ 8.75. On the other hand, the total charge at the Quetzal Port is US\$ 8.40. Thus, the difference between the two ports in dry bulk handling charge is also small.

On the other hand, the difference between the two ports in vessel service charge is small as well as the cargo handling charge mentioned above.

(6) Prospect of Tariff at Cutuco Port

As to the tariff at the Cutuco Port after the start of operations, private terminal operators will submit the tariff to the regulatory agency, viz. AMAP for approval. The current tariffs of the Acajutla Port and Quetzal Port with small difference mentioned above would be referred when making draft tariffs. The current tariff level at the Acajutla Port seems to be reasonable even compared with the international level, whereas the improvement of cargo handling efficiency is considerably required so as to save vessel-staying costs.

10.2.5 Container Terminal Operation System by Computer

(1) Container Terminal Operation and Information Systems

It is expected that a private operator of the La Unión container terminal will introduce computer system. In this paragraph, the computer system is presented for reference.

1) Container Inventory Control System

Inventory control system of containers stored in the Container Yard (CY) is the important task of the container terminal. It is essential to grasp the location and kind of containers stored in C.Y. to operate a container terminal efficiently.

Before the introduction of a computer system, a black (white) board was used for container inventory control in developed countries. This black (white) board designed the configuration of C.Y. and rectangles indication slots of containers. Entering and changing numbers on each slot was done manually. As the numbers of containers increased and the size of container terminals, became larger, then the use of cards was adopted. This method, still seen in some container terminals of developing countries, controls container inventory with cards on which basic information on containers is written. The personnel arranges these cards by shipping line, yard location and container number and grasp containers' location or status. From the experience in developed countries, it is observed that it is impossible to manage container inventory by this card system when the number of containers in C.Y. exceeds 3,000 TEUs. It becomes necessary to introduce the computer system for container inventory control as a next step.

Containers in C.Y. must be sorted and stored by:

- a) Shipping company (shipping agent)
- b) Container size and kind
- c) Loaded container by vessel, port of loading and discharge
- d) Container status: laded / empty, or sound / damaged

Gate clerks, yard control and container handling equipment driver should be linked to each other to exchange information effectively and assure the accuracy of information on containers. The above information is entered into the terminal computer at the gate house and transmitted to the control center in real time. The yard control center operates container handling equipment to pick up/stack the designated containers.

2) Container Loading/Discharging Operation Control System

When two or more groups serve a vessel, it is necessary to equalize the work loads of each group. Furthermore, it is important to prepare an operation plan so that ship's cranes do not interfere each other. In loading export containers, it is important to load containers based on the yard planning system by weight, port of discharge and container size for stability and safe navigation of vessel. Refrigerated container and hazardous containers must be loaded according to the international regulations.

Required functions for loading/discharging operation system are as follows:

- a) Container loading operation system
- b) Container discharging from operation system
- c) Container shifting (re-handling) operation system
- d) Vessel hull strength calculation system

Necessary information about the containers should be obtained from shipping lines or their agents as early as possible. Obtaining the information in advance enables a terminal operator to prepare the working schedule (sequence check list) indicating the order of loading/discharging containers and minimize the operation time. Before preparing the working schedule, it is necessary to obtain the latest stowage bay plan after the last port's operation. The necessary information on containers is as follows:

- a) Name of vessel and voyage number
- b) Date of departing from the last port
- c) Estimated time of arrival (ETA)
- d) Details of discharging / loading containers
- e) Special container lists
- f) Temperature of refrigerated cargoes
- g) IMO classification of hazardous cargoes
- h) Draft of vessel at departing from the last port and estimated draft at the entry

In modern ports, the above information is transmitted by facsimile between the terminal operator and the shipping agent. After loading containers, the terminal

operator prepares the stowage bay plan, which indicates the result of the operation, and passes it to a captain or shipping agent. Making the stowage bay plan is an important task for the terminal operator. In modern container terminals, the operation section makes stowage plan with a computer system. The stowage bay plan includes the following information.

- a) Container prefix and container number
- b) Container size (20', 40' and 45')
- c) Port of loading and discharging
- d) Container weight and description of special cargoes
- e) Ship's location in hold / on deck (bay – row – tier)

(2) Container Terminal Information Transmittal System

The data and information transmittal system currently in use at container terminals, consist of the is the following four means, some of which are used to detect the locations of the handling equipment in a terminal, in addition to exchange of information:

1) Radiotelephone (Handy Talkies) System

This communication system using radiotelephones has been used since the start of container transport, in which communication is done only one way at a time. After the number of containers increased and the development of electronic communication devices made a remarkable progress, this system ceased to be the major means and has been used only as a supplemental means of communication at ordinary container terminals. It is still popularly used at small-scale container terminals and inland depots (van pool) and more extensively by drivers of marine container transport trucks.

2) Mobile Radio Terminal on Vehicle System

In this system, the mobile radio (receiver/transmitter) on vehicles is connected with the host computer in the operation office (container yard control center room), through a party of the shipping line. Information is exchanged in real time through the radio terminal on vehicles or the handy terminal carried and operated by the workers in the yard. While the output power is low, the performance range generally covers the entire terminal area with the help of a network of antennas spread all over and linked with coaxial cables, etc. Although this type of equipment is being developed and made by a few manufacturers in some countries, it is expected to be widely introduced to various physical distribution facilities before long.

3) Mobile Telephone System (Personal Handy Telephone System)

This is a communication system with mobile telephone using weak radio beams, which are converted from the commonly used type of mobile telephone. As their range performance is within a radius of approximately 100 meters, antennas need to be installed on lighting poles, etc. to cover a vast container terminal area. This

system is extensively used as the information transmittal system at small-scale container terminals and warehouses. As the initial investment costs for the system are low, it is expected to be more popular at inland container depots, van pools, etc.

4) GPS-Global Positioning System

By installing the GPS receivers on the container handling equipment, they can be radio-located in real time. However, the GPS receivers are different in their prices and accuracy from model to model. It should also be noted that there might be dead ground (or blind spots) within the terminal where radio wave is prevented from reaching the receivers by huge container handling equipment and/or a high stack of containers in a yard. In order to solve these problems and get rid of the fading or dead spots, it is necessary to set up antennas, as well as to have a separate system for communication so as to secure transmittal of handling orders to the container handling equipment operator.

This GPS is not yet adopted at many terminals since the initial investment costs are higher than other systems. But as the size of normal container terminals become larger and larger, this system, tends to be introduced in a short time without the need for additional engineering works and is expected to prevail at existing container terminals too.