

## 14.9 Wave Disturbance

### 14.9.1 Short-period Waves

The Study Team employed a numerical simulation model (Wave Diffraction Model by Takayama) to evaluate wave disturbance in the port basins caused by short-period waves. Characteristics of the incoming waves were determined by the wave hindcasting survey (See 8.2 and Table 14.9.1).

**Table 14.9.1 Characteristics of Incoming Waves**

Wave direction	Period	Smax
SSW-NE	7 seconds	25

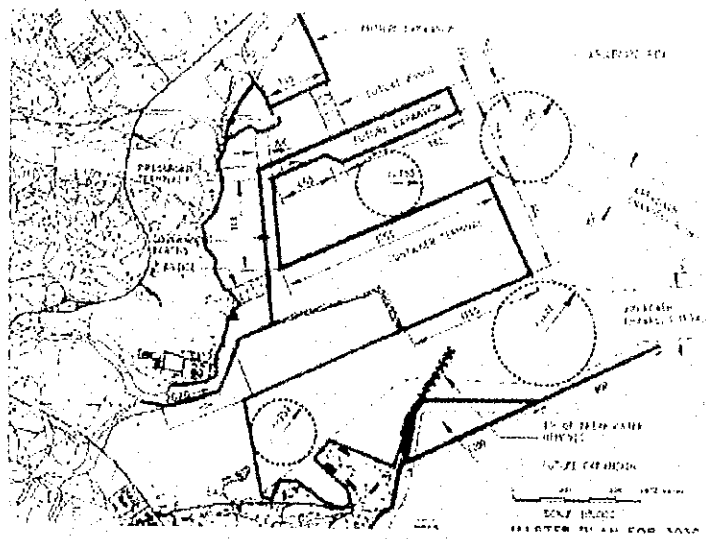
Wave height was evaluated in front of the main quays included in the master plan. Table 14.9.2 shows the estimated berth availability, or the proportion of the duration in which wave height is lower than 50 cm at the berth alongside. The Study Team prepared three alternative layouts (master plan 1-3, See Figure 14.9.1) and compared berth availability. Only master plan 3 provided a satisfactory level of berth availability for all the main quays. Those quays will be available during over 95 % of a year and the availability of existing container terminal will be significantly improved. The Study Team thus determined the configuration of the breakwater.

The Study Team evaluated wave disturbance for short-term development based on master plan 3. Plan B can provide sufficient protection, while Plan A can not ensure safe berthing (See Figure 14.9.2).

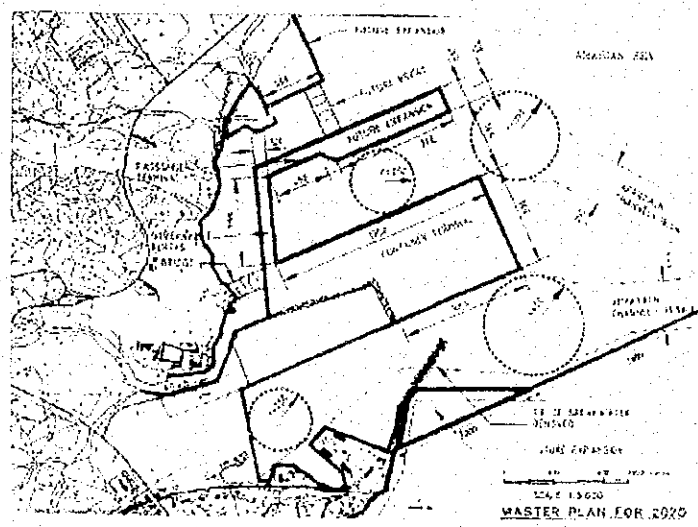
**Table 14.9.2 Berth Availability (short-period waves)**

	Existing layout	Master plan (3)	Short-term plan A	Short-term plan B
Bulk terminal	97.8	97.0	96.6	97.0
Existing container terminal	92.5	96.0	71.9	96.9
Eastward-extended container terminal	-	96.2	-	96.2
Northern basin container terminal	-	98.1	96.5	-
Government berths	-	97.0	50.2	93.1

Master plan 1



Master plan 2



Master plan 3

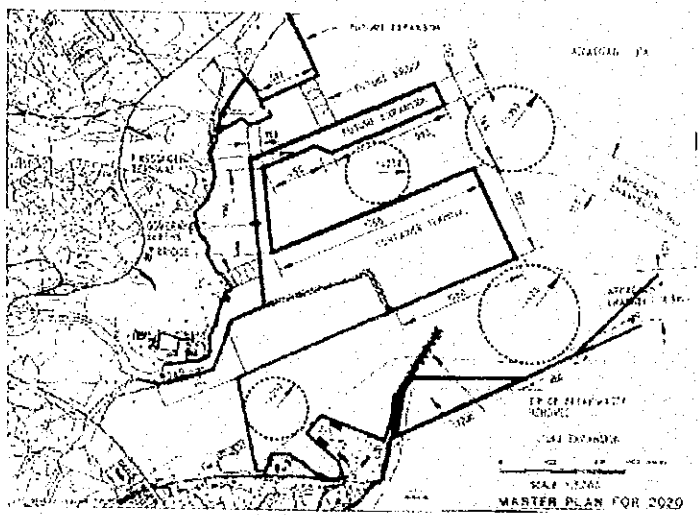
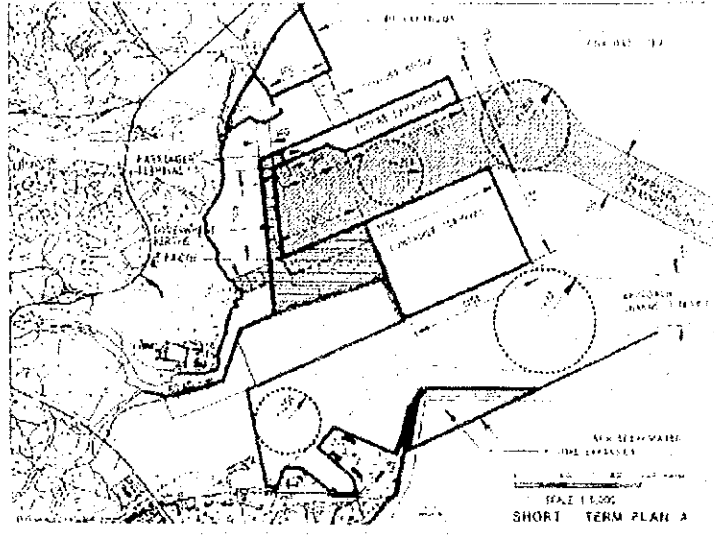


Figure 14.9.1 Alternative Layouts (Master Plan 1-3)

Short-term Plan A



Short-term Plan B

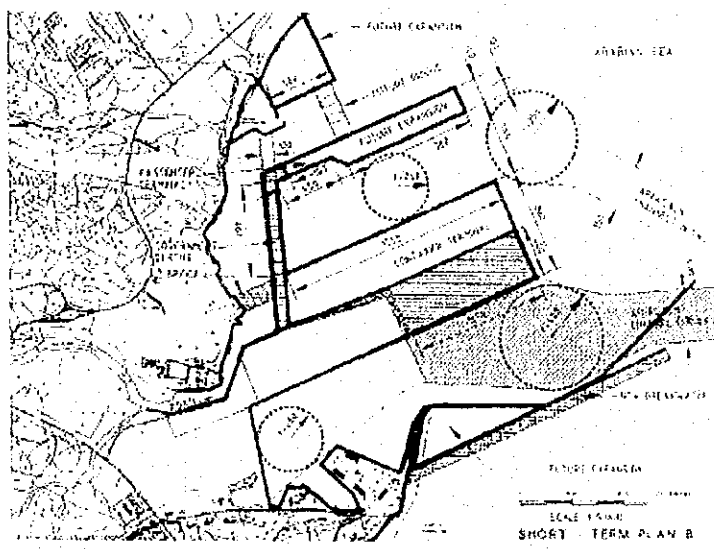


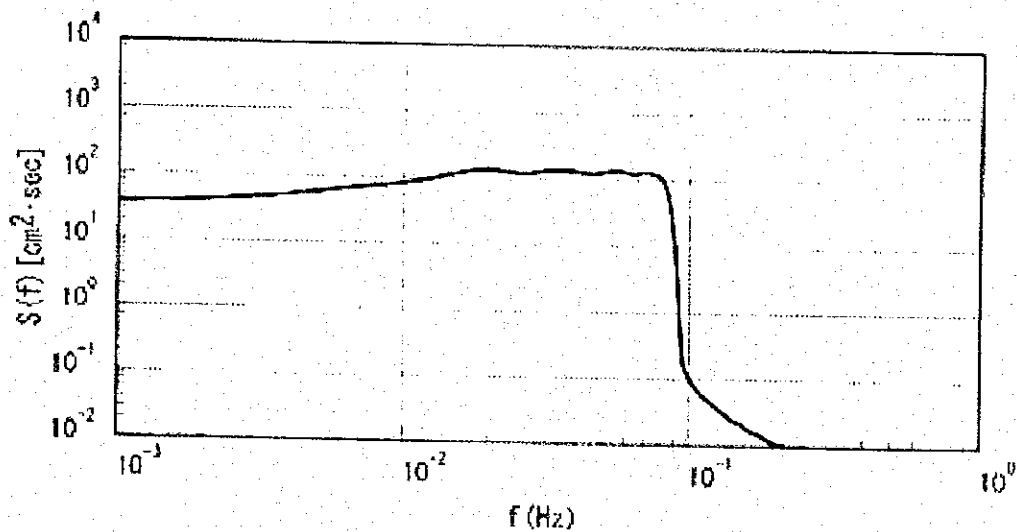
Figure 14.9.2 Short-term Plans

## 14.9.2 Long-period Waves

A different numerical simulation model (The Boussinesq Equation Model) was employed to estimate the effects of long-period waves. Characteristics of the incoming long-period waves were determined taking into account the existing survey data. (See 8.2 and Table 14.9.3). The spectrum of incoming long-period waves was assumed as shown in Figure 14.9.2.

**Table 14.9.3 Characteristics of Long-period Waves**

Wave direction	Period	Spectrum density	Wave height ( $H_{1/3}$ )
S-SE	12-300 seconds	100 $\text{cm}^2 \text{ second}$	11.7 cm



**Figure 14.9.3 Spectrum of Long-period Waves**

Wave height and wave period were evaluated besides the main quays included in the master plan. Harmful effects of long-period waves will be reduced in the port geometry proposed by the master plan (See Table 14.9.4). Long-period wave motions in front of the existing container terminal will become less serious since the master plan layout can reduce a wider range of energy than the existing one (See Figure 14.9.4). However, further study based on long-period wave observation data will be required to estimate the detailed nature of wave motions. The model testing currently carried out by MOTH will give another perspective on this issue.

**Table 14.9.4 Wave Transformation Estimate (long-period waves)**  
(cm)

	Wave direction	Existing layout	Master plan
Existing container terminal	S	11.7	10.6
	SE	19.4	11.5
Bulk terminal	S	9.1	7.6
	SE	13.7	17.0
Eastward-extended container terminal	S	-	8.3
	SE	-	14.9
Northern basin container terminal	S	-	9.5
	SE	-	11.2
Government berths	S	-	10.4
	SE	-	15.1

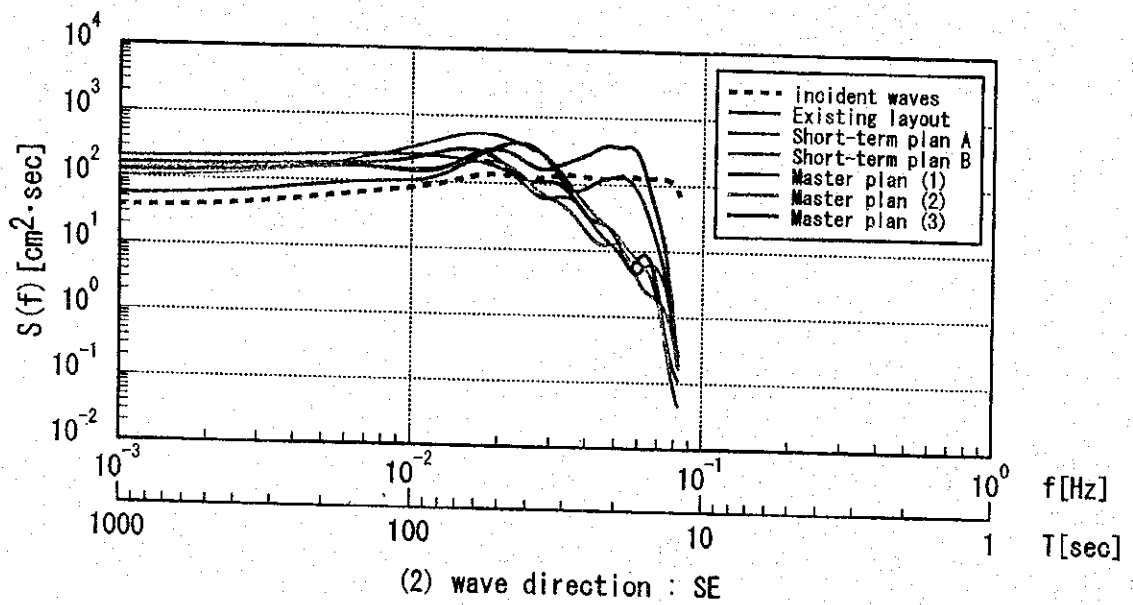
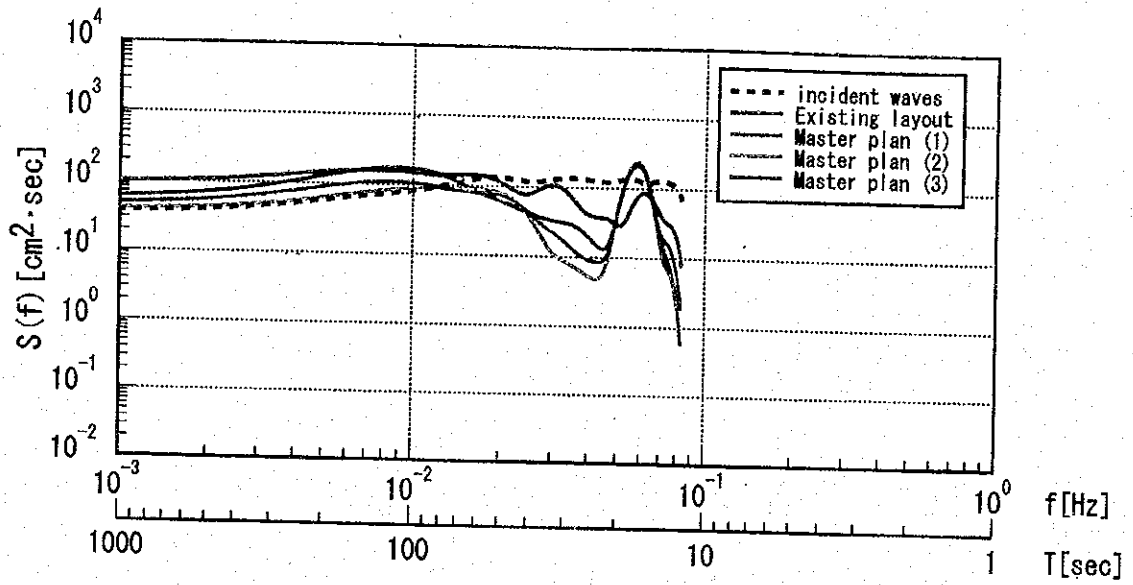


Figure 14.9.4 Energy Spectrum Comparison at the Existing Container Terminal

## 14.10 Capacity Evaluation

A numerical simulation model, "Witness", was employed to evaluate whether the port capacity would be sufficient to deal with the increasing cargo and vessel traffic throughout the planning period (See Figure 14.10.1). Characteristics of the calling vessels, productivity of the terminal, navigation requirements were determined as shown in Table 14.10.1,2.

**Table 14.10.1 Calling Vessels Conditions (in 2020)**

Vessel type	Frequency of call	Productivity	Cargo volume	Maneuvering and idling time
Container (mother)	22 calls / week	Max 6 gantries 40 TEUs/crane	3.1 million TEUs 2,800 TEUs / vessel	3 hours
Container (feeder)	32 calls / week	Max 3 gantries 40 TEUs/crane	3.1 million TEUs 1,960 TEUs / vessel	2.25 hours
Bulk cement carrier	1 call / week	200 t/hour	500,000 t in total 10,000 t / vessel	2.25 hours
Dry bulk carrier	65 calls / year	500 t/hour	1.3 million t / year 20,000 t / vessel	2.25 hours
General cargo vessel	112 calls / year	Max 2 gangs 30 t/hour/gang	300,000 t / year 2,500 t / vessel	2.25 hours
Fuel tanker (local use)	68 calls / year	300 t/hour	540,000 t / year 7,000 t / vessel	2.25 hours
Fuel tanker (bunkering)	23 calls / year	10,000 t/hour	1,880,000 t / year 70,000 t / vessel	2.25 hours
Passenger vessel	60 calls from Nov to Apr	8 hours in berth	-	2 hours
Launch and non-trading vessel	44 calls / month	1)	-	2 hours

1) These vessels are taken into account only for evaluating channel congestion

**Table 14.10.2 Navigational Conditions**

Turning basins	Vessels	Navigational conditions
Turning basin 1	Mother for CT 1-7 Feeder for CT 5-7	Channel 1 and 2 are closed while Turning basin 1 is occupied
Turning basin 2	Bulk carrier Feeder for CT 1-4	Channel 2 is closed while Turning basin 2 is occupied
Turning basin 3	Mother for 8-12	Channel 3 and 4 are closed while Turning basin 3 is occupied
Turning basin 4	Feeder for 8-12 Passenger vessel	Channel 4 is closed while Turning basin 4 is occupied

Berth occupancy ratio and average waiting time are shown in Table 14.10.3. This result indicates that the capacity provided by the master plan is sufficient to respond to the vessel traffic in 2020.

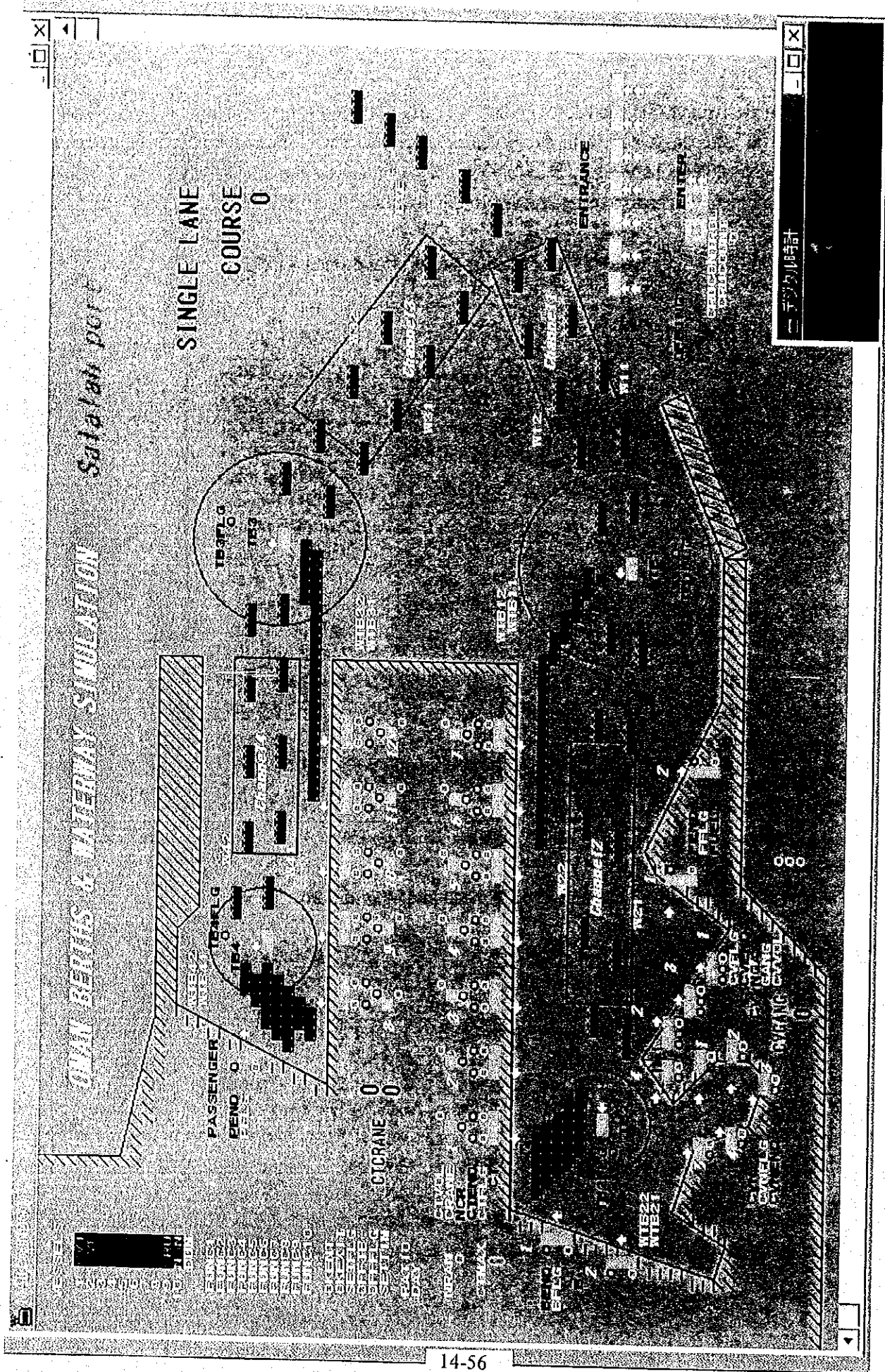


Figure 14.10.1 Simulation Modeling by "WITNESS"



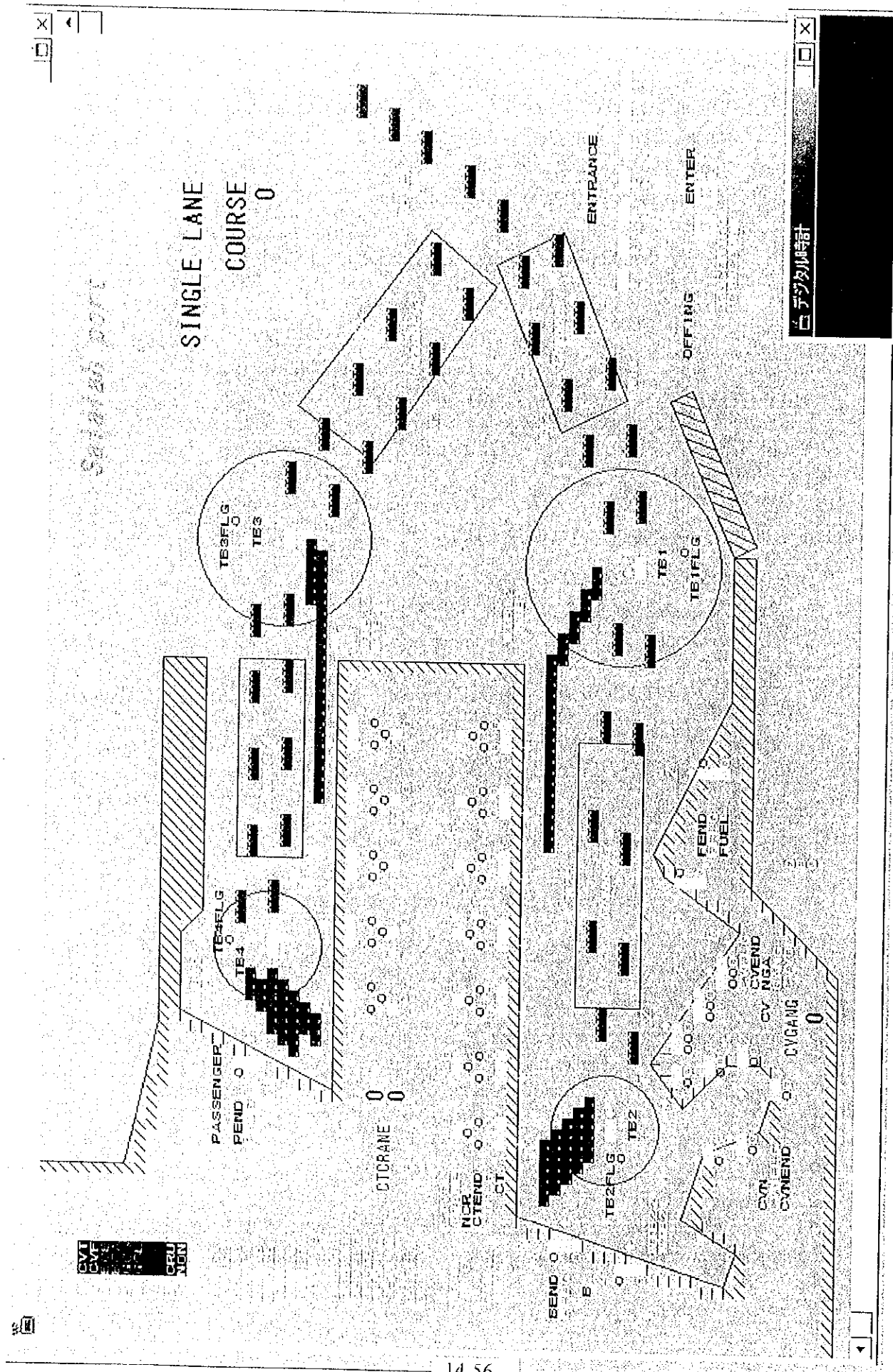


Figure 14.10.1 Simulation Modeling by "WITNESS"

**Table 14.10.3 Berth Occupancy Ratio**

Berth	Berth occupancy ratio
Container berths	0.51
Bulk berths	0.30
General cargo berths	0.14
Oil berths	0.15

**Table 14.10.4 Waiting Time**

Vessel type	Average waiting time (minutes)
Container vessel (mother)	43
Container vessel (feeder)	55
Bulk cement carrier	197
Dry bulk carrier	106
Fuel tanker (local use)	29
Fuel tanker (bunkering)	88

Table 14.10.3 also indicates that it might be possible to handle containers with fewer berths or lower productivity. This is due to a linear quay alignment which enables flexible crane deployment. The Study Team examined sensitivity of the waiting time with different sets of parameters (See Table 14.10.5). This result indicates that consistently high productivity in the container terminal is indispensable to provide customers with satisfactory services. On the other hand, 10 container-berth scenario is not recommendable since waiting time becomes too long. Eleven container-berth scenario might be acceptable, though further study will be needed in the future taking into account an increased proportion of import/export containers in the yard-side operation.

**Table 14.10.5 Sensitivity Analysis on Average Waiting Time**

Case	Original case	Reduced productivity <sup>1)</sup>	(minutes)	
			11 container berths	10 container berths
Container vessel (mother)	43	139	72	127
Container vessel (feeder)	55	190	92	181
Bulk cement carrier	197	347	-	-
Dry bulk carrier	106	222	-	-

1) Based on the following productivity:

container: 30 TEU/hour, cement: 150 t/hour, dry bulk: 300 t/hour

The Study Team also carried out a capacity evaluation of the short-term developments. Table 14.10.6 shows that Plan A brings about much longer waiting times than does Plan B. Plan A is thus not recommendable.

**Table 14.10.6 Capacity Evaluation of the Short-term Development Alternatives**

Vessel type	Average waiting time (minutes)	
	Short-term Plan A	Short-term Plan B
Container vessel (mother)	158	70
Container vessel (feeder)	198	90

## 14.11 Economics of Port Development

Economic analysis of Salalah Port expansion is undertaken in this section. An economic analysis looks at the viability of a project from the viewpoint of the national economy of the country where the project is being planned. It also serves to prepare indicators to compare multiple projects in a country to help assessing priority of the projects.

### 14.11.1 Purpose and Methodology of the Economic Analysis

#### (1) Purpose

The purpose of the economic analysis is to appraise the economic feasibility of the urgent projects, which are defined in 14.8.2 and 14.8.3, from the viewpoint of the national economy. This section evaluates the economic cost and benefits so that the government of Oman can compare various projects to assign priority in view of the national economy.

#### (2) Methodology

The economic internal rate of return (EIRR) based on the cost-benefit analysis is used to appraise the feasibility of a project from the viewpoint of national economy. In estimating the costs and benefits of the project in an economic analysis, "economic pricing" is usually taken. Economic pricing means the evaluation of costs and benefits on the basis of the shadow prices, and usually in terms of international prices, or border prices. In view of the nature of the present study as a master-plan stage, economic pricing was not applied because the difference between the market prices and international price in Oman is negligibly small compared with the range of the estimated cost.

#### (3) Cases

There are 8 cases to be studied in the economic analysis. Major 2 categories stand for the assumption of the cargo demand; low growth with 30% share and high growth with 20% share. Each of these demand growth cases have 4 different cases for port development; Plan A (Short Term), Plan A (Short Term + Long Term), Plan B (Short Term) and Plan B (Short Term + Long Term).

Plan A entails the expansion of the container yard toward north at first (A Short Term), then the completion of the total area (A Long Term). Plan B expands the container yard toward east first (B Short Term), then completes the total area (B Long Term). Plan B requires the extension of breakwater to the full length at the first stage, thus increasing the required investment comparatively higher. For details, refer to 14.6.

## 14.11.2 Assumptions

### (1) Base Year

The base year means the starting year of the economic analysis. Taking into consideration the construction schedule, the year 2001 is set as the base year for this study.

### (2) Project Life

Considering the depreciation period of the main infrastructure of the port, and the construction period thereof being 4 years, the period of calculation as the project life in the economic analysis is assumed to be 34 years from the beginning of construction; from the year 2001 to the year 2034. The commercial operation of the container port expansion is assumed to start at mid-2004.

### (3) Foreign Exchange Rate

The exchange rate assumed for this analysis is U.S.\$1=0.385R.O.

### (4) "Without Case"

The cost-benefit analysis is conducted on the difference between the "With" and "Without" investment cases. Incremental costs and benefits deriving from the proposed project investment are compared and examined whether the difference between benefits and costs generated by the project exceeds the opportunity cost of capital in Oman.

In this study, the "without" case is defined as follows:

- 1) No investment is made for the infrastructure and port equipment for the expansion of the container port.
- 2) Transshipment container cargo volume will increase until it reaches the existing port capacity and then level off.
- 3) Investment for the Free Trade Zone adjacent to the port is not made, however, the investment for the expansion of the existing Industrial Estate is made as planned.

Since the project is to expand the container port to cater for the increasing transshipment container cargo, the most easily defined difference between "With" case and "Without" case is an increase in the revenue of the container port. In addition to this benefit, an increase in the industrial activities highly dependent on the container port was taken up as a measurable effect of the project. In order to measure this effect, the average value added versus production value in the industrial statistics of Oman was employed.

## (5) Cargo Volume

Cargo volume is forecast in 13.3 and 13.4, as shown in Table 14.11.1, 14.11.2 and the figures are taken as a basis of the financial and economic analyses.

**Table 14.11.1 Container Volume Assumptions (Transshipment)**

(, 000TEUs)

Case	2005	2020
High growth 20% share	2,564	6,183
Low growth 30% share	2,980	5,080

**Table 14.11.2 Container Volume Assumptions (Local Cargo)**

(, 000TEUs)

Case	2003	2010	2020
Industrial development scenario 1	149	208	279

### 14.11.3 Economic Pricing

As mentioned in 14.11.1, economic pricing is not made in this economic analysis.

### 14.11.4 Costs and Benefits

Analyses in this chapter include the financial analysis in view of the Omani Government, and the economic analysis in view of the Omani national economy. Basic data is taken from the financial analysis of the projects (section 14.2) and economic impact evaluation (section 17.5).

#### (1) Benefits

In view of the financial position of the Oman Government, the payment from SPS based on the concession agreement is the source of revenue. It includes land rent, royalty, franchise fee, income tax from SPS, and 20% of dividend from SPS if it is available.

However, in view of the Oman National Economy, the benefits expected from the port development are those directly or indirectly accrued from port construction and operation, regardless of the fact that they are quantifiable or not. The major ones will be:

1. Port charges paid to SPS,
2. Savings for those who use Salalah port, in terms of costs, time, or other convenience,
3. Value added accrued from the economic activities which will be generated by construction work of the port,
4. Value added accrued from the economic activities which will be generated by industrial

- development taking advantage of the port development,
5. Increase in employment opportunities accrued from the above port construction, port operation and the industrial development, and
  6. Foreign exchange saving and earning from these activities.

Among the above major 6 benefits, 1 (port charges) and 2 (savings of port users) are the benefits arisen directly from the port development project. The saving of port users is the expression of appreciation of the port users, and it is not quantifiable directly from certain indicators. However, it can be estimated through figuring out their willingness to pay for charges when they use the Salalah port. A part of it will be collected in the form of port charges, while the remainder will be enjoyed by the port users.

The saving can be estimated as the difference in the transportation cost between the "With case" and the "Without case". The Study Team employed the results of the transportation cost comparison (Table 13.3.13) and assumed that the cost saving is equivalent to the difference of the marginal cost between the transportation via Dubai and via Salalah. Since cost reduction effects differ depending on the transportation routes, the Study Team weighed estimated saving of each route and came up with the average cost saving of US\$ 44/TEU.

**Table 14.11.3 Transportation Cost Saving**

Region	(US\$/TEU)				
	Cost via Salalah	Cost via Dubai	Balance	Throughput Share (%)	Weighed Cost Saving
Middle East	144	160	16	57	9.1
East Africa	140	236	96	21	20.2
Indian Subcontinent	129	195	66	22	14.5
Total	-	-	-	100	43.8

Among the above benefits, 3 and 4 are the trickle-down effects of port development. The effects from the construction work is difficult to quantify. Though the local costs for the construction work will amount to 74 million R.O. (in the case of the short-term project under Plan B), most of them will be used for civil works in the coming 4 years. The workers will be mostly expatriates, and they will not spend much in Oman. Thus, the trickle-down effects from the construction work are estimated to be rather small.

Regarding the benefit 4 (value added from industrial development), the expected economic effects are estimated in Section 17.5. It is rather hard to estimate investment by the private sector, and raw materials/utilities etc. for the envisaged industries and economic activities at this stage. Consequently, value added (production/revenue minus raw materials/utilities minus rent, which roughly corresponds to salary/wage plus profit) was used as the difference between benefits and costs in the private sector.

Out of the total industrial output, the following (shown in Table 14.11.4) is regarded as the port-related effects, while the remainder is considered to be generated by industrial promotion efforts.

**Table 14.11.4 Estimated Value Added Generated from the Industrial Activities**  
(million R.O.)

Activities	Year 2010	Year 2020	Foreign Investment	Omani Portion	Port-Generated	Coefficient
Manufacturing	49.7	100.8	60%	40%	50%	0.20
Commerce	101.0	197.3	20%	80%	50%	0.40
Redistribution	125.3	170.8	80%	20%	100%	0.20
Transportation Storage & Communication	173.4	289.8	60%	40%	80%	0.32
Tourism	5.9	11.7	40%	60%	10%	0.06

Benefits 5 and 6 include both direct and indirect benefits from the port development, and may overlap the benefits 1-4. The estimated benefits 5 and 6, generated from the port related industries are shown in Table 14.11.5, with the same assumptions as the above.

**Table 14.11.5 Estimated Employment and Foreign Exchange Earning Generated from the Port-related Industries**

**A Employment Opportunities**

	Year 2010	Year 2020	Port-generated	Year 2010	Year 2020
Manufacturing	4,800	8,600	50%	2,400	4,300
Commerce	800	1,500	50%	400	750
Redistribution	1,100	1,300	100%	1,100	1,300
Transportation, Storage & Communication	5,000	5,900	80%	4,000	4,720
Tourism	500	1,000	50%	250	500
<b>Total</b>	<b>12,200</b>	<b>18,300</b>		<b>8,250</b>	<b>11,570</b>

**B Foreign Exchange (Million R.O.)**

	Year 2010	Year 2020	Port-generated	Year 2010	Year 2020
Manufacturing	51.8	102.3	50%	25.9	51.2
Redistribution	96.4	131.4	100%	96.4	131.4
Tourism	7.1	14.2	50%	3.6	7.1
<b>Total</b>	<b>155.3</b>	<b>247.9</b>		<b>125.9</b>	<b>169.7</b>



## (2) Costs

Items to be considered as the costs of the project are as follows:

- 1) Port expansion
  - 1 Construction cost of the port infrastructure
  - 2 Investment cost of the port equipment
  - 3 Salary/wage and administration cost
  - 4 Operation/maintenance cost of the container terminal
- 2) Port-generated industry and other economic activities
  - 1 Investment by the government and private sector
  - 2 Operation/maintenance cost, raw materials/utilities etc.

From the Government's financial stand point of view, only the construction cost of the port infrastructure should be counted as the cost. That is because the Government constructs the port infrastructure according to the concession agreement. In view of the national economy, all the above items should be regarded as the project cost.

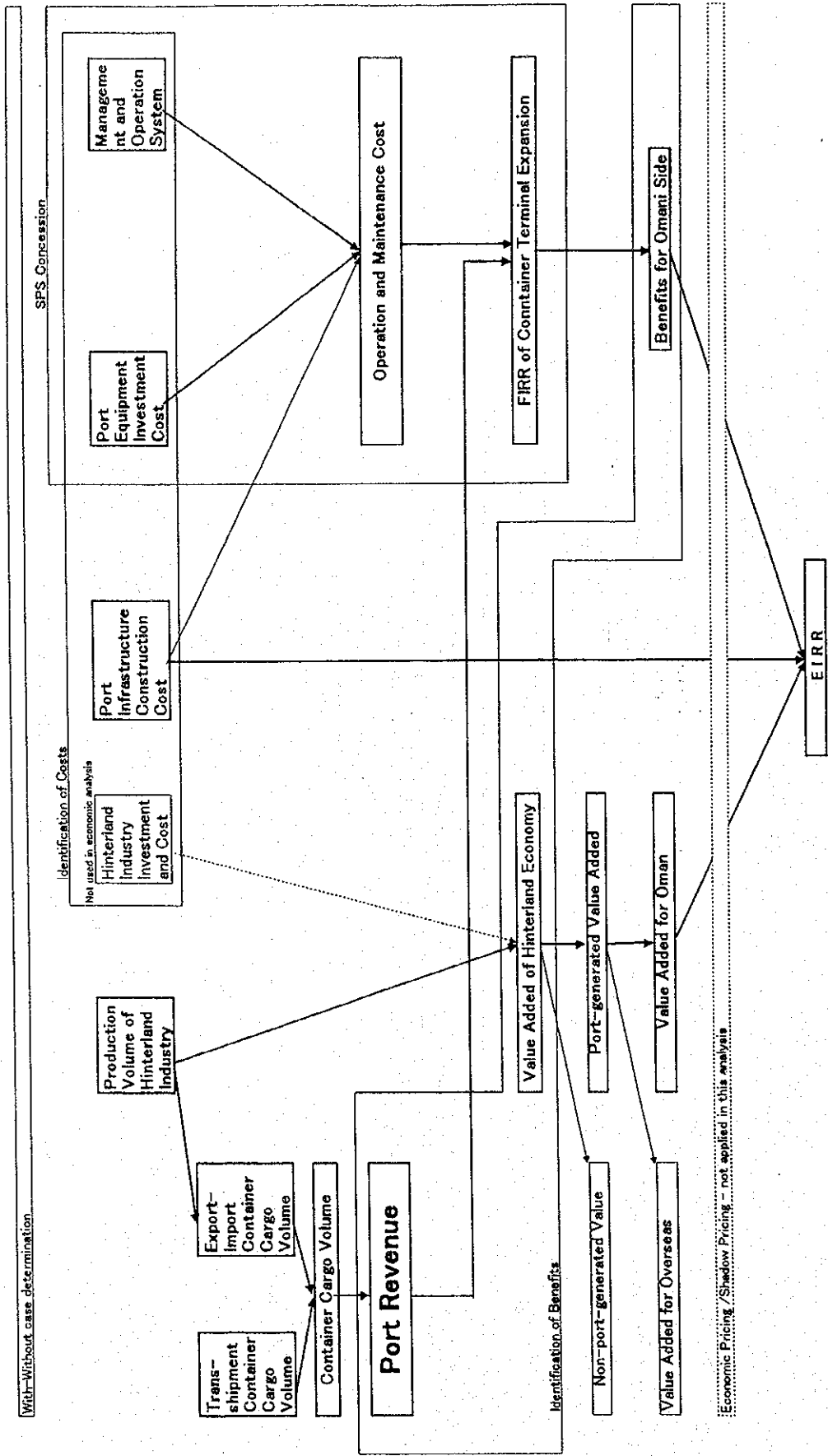
Table 14.11.6 summarizes the items included in the financial and economic analysis.

**Table 14.11.6 Project Evaluation**

The following items are counted either as costs or benefits in the financial and economic evaluations

Items	FIRR of SPS	FIRR of the Government	EIRR of Development (without secondary benefits)	EIRR of Development (including secondary benefits)	Port
Construction of Infrastructure	-	Cost	Cost	Cost	Port
Operation of Infrastructure	Cost	-	Cost	Cost	
Procurement of Superstructure	Cost	-	Cost	Cost	
Operation of Superstructure	Cost	-	Cost	Cost	
Royalty Fee	Cost	Benefit	-	-	
Rental Fee	Cost	Benefit	-	-	
Franchise Fee	Cost	Benefit	-	-	
Corporate Tax	-	Benefit	-	-	
Dividend	-	Benefit (20% of the dividend)			
Salary for Employees	Cost	-	Cost	Cost	
Port Charge	Benefit	-	Benefit	Benefit	
Reduction of Transportation Costs	-	-	Benefit	Benefit	
Value Added by Port-related Industries	-	-	-	Benefit (in the case of Omani investment)	

Figure 14-11-1 Flow of Economic Analysis



### 14.11.5 Analysis

The economic internal rate of return (EIRR) based on the cost-benefit analysis is used to appraise the economic feasibility of the project from the viewpoint of the national economy, and help the government to consider priority among various projects in the country.

The EIRR is the discount rate which makes the difference between costs and benefits of a project during the project life zero. Calculation formula is as follows:

$$\sum_{i=1}^n (B_i - C_i) / (1+r)^{(i-1)} = 0$$

Where

n: Period of economic calculation

$B_i$ : Benefits in  $i$ -th year

$C_i$ : Costs in  $i$ -th year

r: Discount rate

EIRRs of the proposed projects are shown in Table 14.11.7, together with the result of sensitivity analysis on the Plan B cases. EIRR is calculated in two cases; depending on whether the value added is included or not in the benefit. Sensitivity analysis is carried out on the following cases: 10% decrease in revenue, 10% increase in investment and cost, and both of those.

Regarding the construction costs of port infrastructure, the following will be the matters to be decided by the project owner (the Government, in this case):

- 1) Whether the construction costs of the Government berths and bridge should be included in the project costs or not, and
- 2) Whether all the breakwater construction costs should be shouldered by the short-term project or not.

Therefore, the EIRR calculation assumed three cases, depending on the costs included in the port infrastructure construction, namely,

- 1) All the port infrastructure construction costs.
- 2) The port infrastructure construction costs excluding that of the Government berths and bridge.
- 3) The port infrastructure construction costs excluding that of Government berth and bridge, with a part of breakwater construction costs, spread over to the long-term project.

**Table 14.11.7 EIRR**

Benefit		EIRR										
		Govt FIRR					Port charge + Reduction of transportation costs + Port-related industrial VA					
Costs of infrastructure construction	Short	High (w/ 20% share)	Low (w/ 30% share)	All costs included	W/O government berth & bridge	W/O government berth & bridge; a part of breakwater cost spread over to the long-term project	All costs included	W/O government berth & bridge	W/O government berth & bridge; a part of breakwater cost spread over to the long-term project	All costs included	W/O government berth & bridge	W/O government berth & bridge; a part of breakwater cost spread over to the long-term project
Plan B	Short & long	High (w/ 20% share)	5.3	9.4	10.1	10.1	48.5	53.0	48.5	53.0	48.5	53.0
		Low (w/ 30% share)	4.8	9.1	9.9	9.9	50.9	56.0	50.9	56.0	50.9	56.0
Plan A	Short	High (w/ 20% share)	3.2	6.1	6.7	6.7	34.0	35.4	34.0	35.4	34.0	35.4
		Low (w/ 30% share)	3.9	6.9	7.6	7.6	35.0	36.5	35.0	36.5	35.0	36.5
Plan B	Short & long	High (w/ 20% share)	5.5	6.6	6.9	6.9	32.5	33.7	32.5	33.7	32.5	33.7
		Low (w/ 30% share)	3.8	6.3	6.7	6.7	33.4	34.6	33.4	34.6	33.4	34.6

**Table 14.11.8 Sensitivity Analysis**

EIRR						
Benefit		Port charge + Reduction of transportation costs				
Costs of infrastructure construction		W/O government berth & bridge; a part of breakwater cost spread over to the long-term project				
Cases	Base Case		Revenue -10%	Inv/Cost +10%	Revenue -10%	Inv/Cost +10%
	Short	High (w/ 20% share)	8.8	7.3	7.4	6.0
Low (w/ 30% share)		10.0	8.4	8.6	6.9	
Short & long	High (w/ 20% share)	7.4	6.0	6.1	4.7	
	Low (w/ 30% share)	8.9	5.6	5.8	4.2	
Plan B						

## (2) Conclusion

There are various views concerning the appropriate EIRR level to determine whether a project is feasible or not. The leading view is that the project is feasible if the EIRR exceeds the opportunity cost of capital in the country. According to the leading investment companies in Oman, opportunity cost of the private capital in Oman for equity investment is over 22% per year, taking into account tax, dividend and risk. The interest for savings in the bank ranges from 5 to 7% per year, while interest of bank loan ranges between 7 and 10%. Omani government has opportunities to negotiate foreign governmental loans, and their interest level is 3 to 6%.

For infrastructure or social service projects, 5 to 10% are considered to be reasonable level because they will stimulate regional economy helping create additional benefits including job opportunities.

EIRR of the port development excluding the industrial development turned out to be rather low but fit in the range of 5 to 10% as mentioned above. On the other hand, EIRR of the port development including Salalah industrial development as a whole will be very high. In addition, other benefits such as increased job opportunities and foreign currency earning, combined with multiplier effect on the general economy in the region would further improve EIRR.

The results of the economic analysis indicate that the transshipment business itself will not be so beneficial to the Omani economy, while a terminal developer can make good profits. Successful industrial promotion is therefore vital to fully realize the benefits of the master plan achieving regional development. If GSO takes appropriate measures to attract private investments in the Hinterland, there will be a great chance to achieve the development of the regional economy with sustainable sources of employment. Economic returns will be very high if industrial development will occur taking advantage of business environments improved by Salalah's hub port status.

Taking into account the above factors, the Study Team concludes that the proposed project is feasible in view of the national economy of Oman, on condition that an adequate set of policies will be taken for the development of industry and social infrastructure in the region.

## 14.12 Financial Analysis

### 14.12.1 Objective and Methodology of the Financial Analysis

#### (1) Objective

The purpose of the financial analysis is to evaluate the financial feasibility of the project. The analysis focuses on the viability of the project itself and the financial soundness of the new terminal management entity during the project life.

#### (2) Methodology

##### 1) Viability of the project

The viability of the project is analyzed using the Discount Cash Flow Method and appraised by the Financial Internal Rate of Return (FIRR). The FIRR is the discount rate that makes the discounted costs and revenue over the project life equal, i.e. the rate "r" that satisfies the following formula:

$$\sum_{i=1}^n \frac{B_i - C_i}{(1+r)^{i-1}} = 0$$

Where, n : Project life,  
 B<sub>i</sub> : Revenue in the i-th year : the first year is the base year,  
 C<sub>i</sub> : Cost in the i-th year  
 r : Discount rate.

The revenues and costs which are taken into account for the FIRR calculation are summarized in Table 14.12.1.

**Table 14.12.1 Revenues and Costs Employed in the FIRR Calculation**

Revenues	Costs
1) Operating revenues by the project	1) Investments for the project. (installation of handling equipment and replacement/overhaul of Equipment) 2) Operating expenses such as maintenance, repair, rental, personnel and other costs

The revenue and cost items excluded from the FIRR calculation are summarized in Table 14.12.2



**Table 14.12.2 The Revenues and Costs Exempted from the FIRR Calculation**

Revenues	Costs
1) Fund management income	1) Depreciation cost 2) Repayment of the loan principal 3) Interest on loans

When the FIRR exceeds a certain threshold, the project is assessed to be financially feasible: the weighted average of the interest rates of various funds generated for the project is used as the threshold.

2) Financial soundness of the port management body

The financial soundness of the port management body is appraised based on its projected financial statements (Profit and Loss Statement, Cash Flow Statement and Balance Sheet). The appraisal is generally made from the viewpoint of profitability, loan repayment capacity and operational efficiency, using the following formula:

a. Profitability

Rate of Return on Net Fixed Asset

$$= \frac{\text{Net Operating Income}}{\text{Total Fixed Assets}} \times 100\%$$

This indicator shows the profitability of the investments in terms of Net Fixed Assets. It is necessary to keep the rate higher than the average interest rate of various funds for investments, which have different interest rates.

b. Loan repayment capacity

Debt Service Coverage Ratio

$$= \frac{\text{Net Operating Income} + \text{Depreciation Cost}}{\text{Repayment and Interest on Long-term Loans}}$$

This indicator shows whether the operating income can cover the repayment of both the principal and the interest on long-term loans. The ratio should be higher than 1.0 and is desirable to be higher than 1.75 (World Bank recommendation).

c. Operational efficiency

Operating Ratio

$$= \frac{\text{Operating Expenses}}{\text{Operating revenues}} \times 100\%$$

Working Ratio

$$= \frac{\text{Operating Expenses} - \text{Depreciation Expenses}}{\text{Operating Revenues}} \times 100 \%$$

The Operating Ratio shows the operational efficiency of the organization as an enterprise, while the Working Ratio shows the efficiency of the routine operations. When the Operating Ratio is less than 70~75% and the Working Ratio is less than 50~60%, the operation of the organization is assessed to be efficient.

#### 14.12.2 General Prerequisites of Financial Analysis

##### (1) Scope of the Analysis

Scope of the Financial Analysis covers the projects in the Master Plan. The concrete projects are as follows.

- 1) Plan A short term development
- 2) Plan A long term development
- 3) Plan B short term development
- 4) Plan B long term development

GSO is assumed to be responsible for the construction of a new container terminal, civil works and buildings etc. The new terminal management entity is assumed to be responsible for the installation of cargo handling equipment and daily maintenance of all facilities. GSO is assumed to be the owner of the port facilities which are to be leased to the new terminal management entity. It is further assumed that the new container wharf is leased to the new terminal management entity. Taking into account the existing concession agreement for container terminal, the Study Team assumed that the new terminal management entity will pay the following fees to GSO.

A yearly royalty fee: US\$64 thousand per berth to be increased 3% per year.

A yearly rental fee: US\$186 thousand per berth to be increased 3% per year.

A yearly franchise fee: 50% of the net profit after tax when exceeding the aggregate of 15% of the Issued Share Capital.

In this analysis the study team also assumed that SPS would procure and operate a bulk crane.

The financial viability of the project, or FIRR is analyzed based on the difference of revenues and costs between the "With" case (Development plan is executed) and "Without" case (Development plan is not executed). Here, the financial soundness of the port management body is analyzed using only the "With" case.

##### (2) Project Life and Base Year

Taking account of the service lives of the various port facilities, the project life for the financial analysis is determined as 34 years after the first investment is made.

The year 2001 is set as the base year for this study. The base year means the starting year of the financial analysis.

### (3) Revenue and Expenditure

In principal, all costs and revenues are indicated in prices as of February 2000 (US\$1.00=0.385R.O.). Neither price inflation nor increases in nominal wage are considered during the project life.

#### 1) Cargo handling volume and calling vessels

The cargo handling volume and number of calling vessels are estimated based on the cargo traffic forecast. The estimated volumes for two scenarios ( the high growth scenario represents a strong surge in the total container throughput of the region in which Salalah has a 20% share while the low growth scenario represents a moderate increase in the total container throughput of the region in which Salalah has a 30% share ) are shown in Figure 14.8.4 and Figure 14.8.6.

Among all cases, the handling capacity of the container cargo berths will first be reached in the low growth scenario of the short term development plan A in 2006. The container handling volume, number of vessels and generated revenue in development plan B (short term )in cases of the low growth scenario are estimated in Table 14.12.3. Expected revenue from the bulk cargo using new crane is shown in Table 14.12.3-2.

#### 2) Revenue and Cost Items

Calculation of revenues from port activities is based on the present tariff system and future cargo handling volume. In this financial analysis, both incremental traffic and total traffic are considered. Revenues obtained from the operation of the new container terminal are as follows. Costs shouldered and revenues obtained by the new terminal management entity are assumed to be as listed in Table14.12.4.

**Table 14.12.4 Cost and Revenue Items**

Revenue	Cost
1. Port dues	1. Installation of handling equipment
2. Tug Charges	2. Royalty Fee
3. Pilotage Charges	3. Rental Fee
4. Berthing Charges	4. Franchise Fee
5. Cargo handling Charges	5. Daily maintenance cost
	6. Administration and operation cost

Table 14.12.3 Plan B (short term) in case of the low growth scenario

U1= 0.033 (US\$/GT)  
 U2= 1.590 (US\$/vessel)  
 U3= 432.00 (US\$/vessel)  
 U4= 190.00 (US\$/vessel)

Charge from vessels  
 Port due  
 Tug  
 Pilotage  
 Berthing

Cargo Handling Charge (US\$/TEU)  
 Transshipment (US\$/TEU)  
 Import Exp (US\$/TEU)  
 U5= 28 (US\$/TEU)  
 U6= 70 (US\$/TEU)

Year	Volume			Revenue						Marine Charge				Sub Total (US\$:1000)	Berthing (3)*U4	Sub Total (US\$:1000)	Total (US\$:1000)
	Transshipment (1) (TEU)	Import (2) (TEU)	Export (TEU)	Calling Vessels Number of calling Vessels (3)	Av.GT of Vessels (4)	Handling		Sub Total (US\$:1000)	Port Due (3)*(4)*U1	Tug (3)*U2	Pilotage (3)*U3	Berthing (3)*U4					
						Transshipment (1)*U5	Import Export (2)*U6										
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2004	407,475	23,648	0	262	64,000	11,409,309	1,655,359	13,065	552,823	416,188	113,077	49,733	1,132	14,196			
2005	925,130	54,238	0	595	64,000	25,903,643	3,796,679	29,700	1,255,830	945,440	256,874	112,977	2,571	32,271			
2006	1,037,973	61,363	0	667	64,000	29,063,233	4,295,422	33,359	1,409,663	1,061,252	286,816	126,816	2,886	36,245			
2007	1,153,570	68,655	0	742	64,000	32,299,974	4,805,871	37,106	1,567,243	1,179,884	320,572	140,992	3,209	40,315			
2008	1,272,017	76,101	0	819	64,000	35,616,477	5,327,052	40,944	1,728,672	1,301,415	353,592	155,515	3,539	44,483			
2009	1,393,407	83,687	0	897	64,000	39,015,385	5,858,088	44,873	1,894,056	1,425,923	387,421	170,393	3,878	48,751			
2010	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2011	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2012	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2013	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2014	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2015	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2016	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2017	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2018	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2019	1,413,555	86,445	0	775	71,000	39,579,545	6,051,140	45,631	1,816,706	1,232,848	334,962	147,321	3,532	49,163			
2020	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2021	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2022	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2023	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2024	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2025	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2026	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2027	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2028	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2029	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2030	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2031	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2032	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2033	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
2034	1,413,555	86,445	0	651	88,000	39,579,545	6,051,140	45,631	1,889,082	1,034,311	281,020	123,597	3,328	48,959			
Total	41,528,451	2,528,814	0	21,493	88,000	1,162,796,642	177,016,963	1,339,814	54,911,570	34,173,249	9,284,807	4,083,596	102,453	1,442,267			

Table 14.12.3-2 Expected revenue from the bulk cargo using new crane

Charge from vessels  
 Port due  
 Tug  
 Pilotage  
 Berthing

US= 1.3 (US\$/MT)  
 UL= 1.3 (US\$/MT)

UJ= 0.033 (US\$/GT)  
 U2= 1.550 (US\$/vessel)  
 U3= 432.00 (US\$/vessel)  
 U4= 190.00 (US\$/vessel)

Year	Volume		Revenue				Farine Charge				Sub Total (US\$:1000)	Pilotage (3)*U3	Berthing (3)*U4	Sub Total (US\$:1000)	Total (US\$:1000)
	Discharge (1) (MT)	Conventional Loading (2) (MT)	Calling Vessels Number of calling Vessels (3)	Av.GT of Vessels (4)	Discharge (1)*U5	Handling Loading (2)*U6	Port Due (3)*(4)*U1	Tug (3)*U2	Sub Total (US\$:1000)						
2001	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2010	425,000	412,000	40	30,000	557,700	535,600	1,093	39,721	63,795	17,333	7,623	128	1,222		
2011	438,100	420,800	41	30,000	569,536	547,040	1,117	40,567	65,153	17,702	7,786	131	1,248		
2012	447,200	429,600	42	30,000	581,360	558,480	1,140	41,412	66,510	18,071	7,948	134	1,274		
2013	456,300	438,400	43	30,000	593,190	569,920	1,163	42,258	67,868	18,440	8,110	137	1,300		
2014	465,400	447,200	44	30,000	605,020	581,360	1,186	43,103	69,226	18,809	8,272	139	1,326		
2015	474,500	456,000	44	30,000	616,850	592,800	1,210	43,948	70,584	19,178	8,435	142	1,352		
2016	483,600	464,800	45	30,000	628,680	604,240	1,233	44,794	71,942	19,546	8,597	145	1,378		
2017	492,700	473,600	46	30,000	640,510	615,680	1,256	45,639	73,300	19,915	8,759	148	1,404		
2018	501,800	482,400	47	30,000	652,340	627,120	1,279	46,485	74,657	20,284	8,921	150	1,430		
2019	510,900	491,200	48	30,000	664,170	638,560	1,303	47,330	76,015	20,653	9,084	153	1,456		
2020	520,000	500,000	49	30,000	676,000	650,000	1,326	48,176	77,373	21,022	9,246	156	1,482		
2021	529,100	508,800	50	30,000	687,830	661,440	1,349	49,021	78,731	21,391	9,408	159	1,508		
2022	538,200	517,600	50	30,000	699,660	672,880	1,373	49,867	80,089	21,760	9,570	161	1,534		
2023	547,300	526,400	51	30,000	711,490	684,320	1,396	50,712	81,447	22,129	9,733	164	1,560		
2024	556,400	535,200	52	30,000	723,320	695,760	1,419	51,557	82,804	22,498	9,895	167	1,586		
2025	565,500	544,000	53	30,000	735,150	707,200	1,442	52,403	84,162	22,867	10,057	169	1,612		
2026	574,600	552,800	54	30,000	746,980	718,640	1,466	53,248	85,520	23,236	10,219	172	1,638		
2027	583,700	561,600	55	30,000	758,810	730,080	1,489	54,094	86,878	23,605	10,382	175	1,664		
2028	592,800	570,400	55	30,000	770,640	741,520	1,512	54,939	88,236	23,974	10,545	178	1,690		
2029	601,900	579,200	56	30,000	782,470	752,960	1,535	55,785	89,594	24,343	10,708	181	1,716		
2030	611,000	588,000	57	30,000	794,300	764,400	1,558	56,630	90,952	24,712	10,871	184	1,742		
2031	620,100	596,800	58	30,000	806,130	775,840	1,581	57,476	92,310	25,081	11,034	187	1,768		
2032	629,200	605,600	59	30,000	817,960	787,280	1,604	58,321	93,668	25,450	11,197	190	1,794		
2033	638,300	614,400	60	30,000	829,790	798,720	1,627	59,167	95,026	25,819	11,360	193	1,820		
2034	647,400	623,200	61	30,000	841,620	810,160	1,650	60,012	96,384	26,188	11,523	196	1,846		
2035	656,500	632,000	62	30,000	853,450	821,600	1,673	60,858	97,742	26,557	11,686	199	1,872		
Total	13,665,937	13,141,126	1,279	30,000	17,765,718	17,083,464	34,849	1,266,126	2,033,475	552,491	242,994	4,095	38,944		

- 3) Charges from vessels
- a) Port dues US\$ 0.033 per GRT
  - b) Tug Charges US\$ 1,590 per vessel
  - c) Pilotage Charges US\$ 432 per vessel
  - d) Berthing Charges US\$ 190 per vessel

- 4) Cargo handling Charges
- a) Transshipment (container) US\$ 28 per TEU
  - b) Import/Export (container) US\$ 70 per TEU
  - c) Bulk handling US\$ 1.3 per ton

5) Investment cost

Initial investment costs are summarized in Table 14.12.5.

**Table 14.12.5 Project Cost of the new terminal management entity** unit:US\$1,000

	Year	Plan A Short	Plan B Short	Plan A Short + Long	Plan B Short + Long
Equipment :	2003	20,811	46,166	20,811	46,166
Container cranes , Yard Crane, bulk crane etc	2004	31,217	46,163	31,217	46,163
	2005				
	2006			92,311	
	2007				52,026
	2008				
	2009			6,349	6,349
	2010				
	~				
	2012				
	2013			78,040	78,040
<b>Total</b>		<b>52,028</b>	<b>92,329</b>	<b>228,728</b>	<b>228,744</b>

6) Operation Expenses

The annual operation expenses are calculated in the following manner.

a. Personnel cost

The annual personnel costs are estimated based on the number of personnel required to manage and operate the port facilities given the estimated cargo volumes. Personnel cost for the new terminal management entity begins in 2004.

**Table 14.12.6 Personnel Cost**

	Number of Person	Personnel Cost per person per month (OR)	Months per year	Exchange rate OR/\$	Personnel cost (US\$:1000)
Plan A Short	350	385	13	1OR=2.59 74	4,550
Plan B Short	490	385	13	1OR=2.59 74	6,370
Plan A Short + Long	1,176	385	13	1OR=2.59 74	15,288
Plan B Short + Long	1,176	385	13	1OR=2.59 74	15,288

**b. Administration and other costs**

Administration and other costs are assumed as 40% of the total personnel cost. This ratio is the one observed at SPS in recent years.

**c. Maintenance and repair cost**

The annual maintenance and repair costs for port facilities are calculated as follows:

Infrastructure :1.0% of the original construction cost  
 Cargo handling equipment :4.0% of the original procurement cost

**d. Depreciation cost**

The annual depreciation costs for equipment are calculated by the straight line method based on their service lives. Residual values after all depreciation are estimated as zero. Depreciation cost is exempted from calculation of the analysis of the viability of the project. In the analysis of the influence on the financial soundness, depreciation cost is calculated on the existing and planned facilities.

**(4) Fund Raising**

Taking into account the present equity position of SPS, the Study Team assumed that a part of the initial investment by the new terminal management entity would be raised by issued stock ,US\$8,377 thousand per berth. The dividend of issued stock is set at 80% of net income after tax, retaining the remaining 20% for future investment. The remaining part of the initial investment is assumed to be raised by foreign funds.

The following conditions are employed for the foreign funds.

Loan period : 20 years  
 Interest rate :8% per annum  
 Repayment :Fixed amount repayment of principal

### 14.12.3. Evaluation of the Project

#### (1) Viability of the Project

##### 1) Calculation of FIRR

The results of the FIRR calculation are shown in Table 14.12.7. In all cases, FIRR exceeds interest rate of the funds (8%).

**Table 14.12.7 Result of the FIRR**

	Plan A (short term)	Plan A (short term + long term)	Plan B (short term)	Plan B (short term + long term)
High growth/ 20% share	22.2	16.7	15.3	14.1
Low growth/ 30% share	28.3	19.2	20.1 (Table 14.12.8)	17.0

##### 2) Sensitivity Analysis

Sensitivity analysis is conducted to examine the impact of unexpected future changes (for example, decrease of the estimated cargo volume, increase of the construction cost). The following three cases are envisioned: (1) the revenue decreases by 10% (2) the project cost increases by 10% and (3) the revenue decreases by 10% and the project cost increases by 10%. The Sensitivity Analysis for the FIRR of plan B in case of the low growth/ 30 % share scenario, the least attractive case, is shown in Table 14.12.9.

**Table 14.12.9 Sensitivity Analysis for FIRR on the plan B in case of the low growth**

	Plan B (short term)	Plan B (short + long term)
Base FIRR	20.1	17.0
Case 1	17.0	14.1
Case 2	18.3	15.3
Case 3	15.3	12.3

3) Judging from this analysis, this project is assessed to be financially viable.



Table 14.12.8 FIRR of short term development Plan B (Low growth/30% share scenario)

(unit : US\$1,000)

Year	Revenue (1)	Cost(2)			Difference (1)-(2)	Net Present Value		
		Investment	Expenses	Total		Revenue	Cost	Difference
2001	0	0	0	0	0	0	0	0
2002	0	0	0	0	0	0	0	0
2003	0	46,166	0	46,166	-46,166	0	32,014	-32,014
2004	14,196	46,163	9,572	55,735	-41,538	8,198	32,185	-23,987
2005	32,271	0	17,344	17,344	14,927	15,519	8,341	7,178
2006	36,245	0	19,477	19,477	16,768	14,514	7,799	6,715
2007	40,315	0	21,658	21,658	18,657	13,444	7,222	6,222
2008	44,483	0	23,888	23,888	20,595	12,353	6,634	5,719
2009	48,751	0	24,787	24,787	23,964	11,274	5,732	5,542
2010	49,163	0	25,100	25,100	24,062	9,467	4,834	4,634
2011	49,163	0	25,233	25,233	23,929	7,884	4,046	3,837
2012	49,163	0	25,367	25,367	23,796	6,565	3,387	3,178
2013	49,163	0	25,500	25,500	23,662	5,467	2,836	2,631
2014	49,163	0	25,635	25,635	23,528	4,553	2,374	2,179
2015	49,163	0	25,769	25,769	23,393	3,791	1,987	1,804
2016	49,163	0	25,905	25,905	23,258	3,157	1,664	1,494
2017	49,163	0	26,040	26,040	23,122	2,629	1,393	1,236
2018	49,163	10,449	26,176	36,625	12,537	2,189	1,631	558
2019	49,163	10,446	26,224	36,669	12,493	1,823	1,360	463
2020	48,959	0	26,361	26,361	22,598	1,512	814	698
2021	48,959	0	26,499	26,499	22,460	1,259	681	578
2022	48,959	0	26,637	26,637	22,321	1,048	570	478
2023	48,959	35,717	26,776	62,493	-13,535	873	1,114	-241
2024	48,959	35,717	26,916	62,633	-13,674	727	930	-203
2025	48,959	0	27,019	27,019	21,939	605	334	271
2026	48,959	0	27,042	27,042	21,917	504	278	226
2027	48,959	0	27,066	27,066	21,893	420	232	188
2028	48,959	0	27,090	27,090	21,869	350	193	156
2029	48,959	0	27,115	27,115	21,844	291	161	130
2030	48,959	0	27,140	27,140	21,818	242	134	108
2031	48,959	0	27,167	27,167	21,792	202	112	90
2032	48,959	0	27,194	27,194	21,765	168	93	75
2033	48,959	10,449	27,222	37,670	11,288	140	108	32
2034	48,959	10,446	27,251	37,696	11,262	117	90	27
Total	1,442,267	205,551	778,169	983,721	458,546	131,285	131,285	0

FIRR= 20.1%

## (2) Financial Soundness of the new terminal management entity

The financial statements and financial indicators, the rate of return fixed assets, debt service coverage ratio, operating ratio and working ratio of the new terminal management entity on the development plan B (short term) in case of the low growth scenario are shown in Table 14.12.10.

### 1) Profitability

The rate of return on net fixed assets exceeds 7% (World Bank Standard) after 2009, the beginning of the operation, in every case.

### 2) Loan repayment capacity

The debt service coverage ratio exceeds 1.75 (World Bank Standard) after 2010 the beginning of the operation in every case. This means that there will be no difficulty in repaying long-term loans from the annual operating revenues.

### 3) Operational efficiency

The operating ratios keep below 70% (World Bank Standard) and the working ratios keeps below 50% (World Bank Standard) after 2010 in every case. This shows that the operation will be efficient.

### 4) Appraisal

Based on the above indicators, it can be judged that the new terminal management entity will be financially sound in every case.

### (3) Conclusion

Judging from the above analysis, this project can be regarded as financially feasible. However, the new terminal management entity should make efforts to heighten the quality of the service, to improve cargo handling efficiency, to secure the forecast cargo volume, and to reduce operating expenses.



Table 14.12.13 Plan B short in case of the low growth scenario

	Unit: US\$, 1,000														
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
<b>Income Statement</b>															
Year															
Operating Revenue	48,959	48,959	48,959	48,959	48,959	48,959	48,959	48,959	48,959	48,959	48,959	48,959	48,959	48,959	48,959
Operating Expenses	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)	(21,826)
Personnel & Administration	8,918	8,918	8,918	8,918	8,918	8,918	8,918	8,918	8,918	8,918	8,918	8,918	8,918	8,918	8,918
Maintenance	6,775	6,775	6,775	6,775	6,775	6,775	6,775	6,775	6,775	6,775	6,775	6,775	6,775	6,775	6,775
Royalty Fee	290	299	308	317	327	337	347	357	368	379	402	414	426	439	452
Rental Fee	844	869	895	922	978	1,008	1,069	1,101	1,134	1,168	1,203	1,239	1,277	1,315	1,353
Depreciation	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965
Net Operating Income	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132
Interest on Long-term Loans	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)	(1,529)
Net Income before Tax	25,603	25,603	25,603	25,603	25,603	25,603	25,603	25,603	25,603	25,603	25,603	25,603	25,603	25,603	25,603
Income Tax	3,077	3,105	3,133	3,161	3,188	3,216	3,243	3,271	3,299	3,327	3,355	3,383	3,411	3,439	3,467
Net Income After Tax	22,526	22,498	22,470	22,442	22,414	22,386	22,358	22,330	22,302	22,274	22,246	22,218	22,190	22,162	22,134
Franchise Fee	9,396	9,499	9,602	9,704	9,806	9,908	10,010	10,112	10,214	10,316	10,418	10,520	10,622	10,724	10,826
Dividend	10,532	10,615	10,697	10,779	10,861	10,942	11,024	11,106	11,188	11,269	11,351	11,433	11,515	11,597	11,679
Accumulated Earnings	34,331	37,005	39,679	42,374	45,089	47,825	50,573	53,317	56,058	58,796	61,529	64,258	66,983	69,704	72,420
<b>Cash Flow</b>															
Year															
Cash Beginning	45,166	38,959	43,217	47,496	51,796	56,111	60,455	64,828	69,229	73,657	78,114	82,599	87,111	91,649	96,221
Cash Inflow	32,131	32,097	32,062	32,026	31,990	31,954	31,918	31,882	31,846	31,810	31,774	31,738	31,702	31,666	31,630
Net Operating Income	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132	27,132
Depreciation	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965	4,965
Long-term Loans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash Outflow	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)	(10,446)
Investment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Repayment of principal	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360	3,360
Interest on Long-term Loans	1,529	1,529	1,529	1,529	1,529	1,529	1,529	1,529	1,529	1,529	1,529	1,529	1,529	1,529	1,529
Franchise Fee	9,396	9,499	9,602	9,704	9,806	9,908	10,010	10,112	10,214	10,316	10,418	10,520	10,622	10,724	10,826
Dividend	10,532	10,615	10,697	10,779	10,861	10,942	11,024	11,106	11,188	11,269	11,351	11,433	11,515	11,597	11,679
Income Tax	3,077	3,105	3,133	3,161	3,188	3,216	3,243	3,271	3,299	3,327	3,355	3,383	3,411	3,439	3,467
Cash Balance	6,208	4,238	4,279	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Cash Ending	38,959	43,217	47,496	51,796	56,111	60,455	64,828	69,229	73,657	78,114	82,599	87,111	91,649	96,221	100,743
<b>Balance Sheet</b>															
Year															
Current Assets	38,959	43,217	47,496	51,796	56,111	60,455	64,828	69,229	73,657	78,114	82,599	87,111	91,649	96,221	100,743
Cash & Deposit	38,959	43,217	47,496	51,796	56,111	60,455	64,828	69,229	73,657	78,114	82,599	87,111	91,649	96,221	100,743
Fixed Assets	36,270	31,306	26,341	21,376	16,411	11,446	6,481	1,516	0	0	0	0	0	0	0
Total Assets	75,229	74,523	73,837	73,172	72,507	71,842	71,177	70,512	69,847	69,182	68,517	67,852	67,187	66,522	65,857
Liabilities	40,878	37,518	34,158	30,798	27,438	24,078	20,718	17,358	13,998	10,638	7,278	3,918	510	0	0
Short-term Loans	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Long-term Loans	40,878	37,518	34,158	30,798	27,438	24,078	20,718	17,358	13,998	10,638	7,278	3,918	510	0	0
Net Worth	34,351	37,005	39,679	42,374	45,089	47,825	50,573	53,317	56,058	58,796	61,529	64,258	66,983	69,704	72,420
Total Liabilities & Net Worth	75,229	74,523	73,837	73,172	72,507	71,842	71,177	70,512	69,847	69,182	68,517	67,852	67,187	66,522	65,857
<b>Financial Indicators</b>															
Year															
Rate of Return Fixed Assets	74.9%	86.7%	107.9%	126.6%	151.8%	178.8%	207.4%	237.5%	269.0%	301.9%	337.2%	374.7%	414.4%	456.4%	499.8%
Debt Service Coverage Ratio	6.57	6.65	7.37	8.39	9.61	10.98	12.51	14.21	16.08	18.13	20.36	22.78	25.40	28.12	30.94
Operating Ratio	44.5%	44.6%	44.7%	44.7%	44.8%	44.9%	45.0%	45.0%	45.1%	45.2%	45.3%	45.4%	45.5%	45.6%	45.7%
Working Ratio	34.4%	34.4%	34.4%	34.6%	34.7%	34.7%	34.8%	34.9%	34.9%	35.0%	35.1%	35.2%	35.3%	35.4%	35.4%



## **15. Port Management System**

### **15.1 Identification of Problem Areas**

#### **15.1.1 Nationwide Port Development Plan**

In Oman, port development is planned and executed on an individual project basis. There is no nationwide port development plan explicitly defined. For example, the scheme of port development, especially the role of the private sector, is different in each port. These different approaches can be attributed to the different circumstances surrounding each port, both in terms of the present condition and expected future role. But for efficient port development, each port's role and development plan should be considered and established in line with a nationwide port development plan. The allocation of government funds in the port sector is also a very important issue. In order to make the most efficient use of the national budget and to avoid duplication of investment, the government must prioritize projects from the viewpoint of national development. For this purpose, a nationwide port development plan also should be established by the government.

#### **15.1.2 Container Terminal**

The container terminal of Port Salalah has 4 consecutive berths of 1,226m. Equipment includes 6 super post panamax quay cranes and 1 panamax quay crane. In addition, two new super post panamax gantry cranes, RTGs, and tractors, were recently introduced. Container throughput at Port Salalah has been increasing steadily, exceeding 600 thousand TEUs in 1999. But the handling volume is still less than the capacity of existing facilities. For efficient use of the existing 4 berths and the new equipment, the cargo volume needs to be increased. Moreover this port aims to be a common-users port, but there are still few shipping companies calling at Salalah besides Maersk-Sealand. The expansion of the container terminal which is now being considered by the GSO and SPS will only be viable if the port can attract other shipping companies.

Cargo throughput must also be increased from the financial point of view. In 1999, the port handled approximately 649,000 TEUs and generated total revenues of R.O. 7,140,716. But SPS posted a net loss of R.O. 3,750,117. The initial investment in the infrastructure alone was about R.O. 50 million. Most revenues of SPS were from cargo handling. To increase the cargo volume, it is necessary for SPS to attract other shipping lines and also establish a well coordinated feeder network from various areas.

This container terminal was developed and designed as a transshipment port and more than 99% of container throughput is transshipment. As a result, while container handling service is available 24 hours, delivering/receiving cargoes service time is from 8:00 to 16:00. This is

understandable because there are few export/import containers at present. But this terminal is also expected to contribute to the development of its hinterland together with the Free Trade Zone. When the volume of import and export cargo from/to its hinterland increases, the operation policy and system should be reviewed to accommodate these import/export cargoes.

### **15.1.3 Conventional Terminal**

Transportation of the goods of the industries in the hinterland of Port Salalah depends heavily on the port, especially on the conventional port. For example, Raysut Cement Company imported about 10,000 tons of raw material and exported over 430,000 tons of cement through the port in 1999. A major problem in the conventional port is its profitability. In 1997, under the management and operation of MOTH, expenditure of the port was R.O. 1,386,527, 90 % of which was labor cost. Revenues from the port amounted to R.O. 658,606, covering only 48% of the expenditure. After SPS took over the management, its first measure to improve the conventional terminal was to reduce the excessive number of operation and engineering employees from 170 to 85. SPS also raised marine charges. However, other problems remain. The cargo handling efficiency is not satisfactory to port users. Some facilities have become deteriorated and require immediate rehabilitation, while some cargo handling equipment is becoming superannuated.

### **15.1.4 Vocational Training**

The Ministry of Social Affairs, Labour & Vocational Training has stipulated a fixed Omanisation ratio in six areas of the private sector. In transport, storage and communications, the ratio should be 60%. In 1995, National Vocational Qualifications (NVQ) and General National Vocational Qualification (GNVQ) were introduced to promote Omanisation and to provide well trained Omanis to strengthen the private sector's role in the economy. GNVQ syllabus is conducted at governmental technical colleges for 3 years. NVQ syllabus is conducted at private training institutions for 2 years. These training systems are financed by GSO.

In 1998, SPS trained 293 trainees out of which 143 trainees were under the NVQ system. The cost of the NVQ system was borne by the government (about R.O. 150 thousand), while the cost of the 150 Non-NVQ trainees was borne by SPS. But in 1999 SPS didn't adopt the NVQ training system even though that system was financially supported by the government. SPS believes that the current training system doesn't meet the SPS's required standard. To promote Omanisation is SPS's basic policy. Therefore SPS has proposed the establishment of a new training school in Salalah and is discussing the matter with relevant organizations. The organizations concerned basically admit the need for the training school, but the financing scheme remains to be fixed. GSO should support SPS's plan to encourage vocational training and to promote Omanisation.

## 15.2 Urgent Measures

### (1) Nationwide port development plan

As mentioned in 15.1.1, for efficient port development, a nationwide port development plan should be made. In order to make the nationwide port development plan, an efficient system of collecting data and statistics of each port is necessary. DGPMA collects basic data of each port every month but is time-consuming and moreover does not include important data such as cargo throughput of each berth which is necessary to make a port development plan. The present statistic collecting system should be improved for MOTH to get sufficient data smoothly.

In addition, when the nationwide port development plan is studied and established, it is necessary for many relevant government organizations and port related private organizations to coordinate with each other. To conduct this process smoothly, an efficient coordination system, such as national port development meeting, which involves various port related organizations should be introduced.

### (2) Establishment of Port Committee of Salalah

In the United States most ports are managed and operated by port authorities established by local governments (state, county, city, etc.). Generally the port authorities are managed independently from the government under the control of the "Board" which is the highest decision council of the port authority. Among 86 major ports, 81 ports have a "Board". Board members of 27 ports are elected while those of 54 ports are appointed by the local government. The first priority of this board is benefit to the region, because ports are considered as public assets which should contribute to regional development.

In Japan the local port council is established at major ports based on the port and harbour law. Generally, the council consists of persons of knowledge (for example professors), members of local assembly, representatives of port related organizations, officials of port related central and local governments and representatives of the port administration body (officials of a local government). Port development plans are examined by the local port council from a view point of local interest, then local plans are established.

Port Salalah is also a public asset and therefore fair and transparent management is vital. At present final decisions of SPS are made by the board of directors. The board includes government officials but all members are representatives of shareholders and the main objective of the board is to increase profits. Therefore it is necessary to establish some kind of committee to balance the profit motive of the private company and the regional development. This committee should include not only the government and SPS but also representatives of the port



users and region.

“Port Committee” should include the following members.

- MOTH
- SPS
- Local Government
- Port Users
- Persons of knowledge and experience

Main functions should be as follows

- approval of port development plan
- supervision of port activities and giving advice
- coordination among port management body, port users, and local government

GSO has a plan to establish a similar committee called the “Port Planning and Regulator Committee”(“PPRC”) This committee will consist of representatives of GSO and SPS, representatives of existing users of the port, and persons experienced in planning, licensing and regulation of ports. The main function of the committee would be as follows.

- approval of general land usage within the port area
- settlement of any dispute arising between the Government and SPS as to land use within the port area
- final determination of any rent or license fee payable by the government in respect of land within the port area
- approval of future developments of infrastructure, additional equipment and any amendments to the layout plan
- approving minimum tariff structures and charges in the event of disagreement within the Tariff Committee
- approving port rules and regulations
- approving rent guidelines

This PPRC has not yet been formally approved. Once it is established, we recommend that its functions be expanded to include those envisaged in the “Port Committee” described above. For this purpose, PPRC should include local government members as the representatives of the region to promote regional development and user friendly activities. Moreover SPS is expected to coordinate port development and FTZ development as mentioned in Chapter 11.4. For this purpose PPRC should involve PEIE, which is responsible for FTZ development at present. And in future it might be necessary to add other organizations which are related to the FTZ development to this committee.

(3)Neutrality of Port Management and Operation

One of the most urgent issues in Port Salalah is to attract shipping companies other than Maersk-Sealand. SPS is known to be under the influence of Maersk-Sealand. When other shipping companies consider using Port Salalah, they are likely to point out this issue and worry whether they will receive the same treatment as Maersk-Sealand. They are also worried that the security of their company's information including customers and cargo-tariffs might be compromised. Before other shipping companies call at Port Salalah, it is essential to wipe out these concerns. SPS has always maintained, however, that its basic policy is to make Port Salalah a common user port and it has had some recent success in attracting another shipping company.

To foster an image of neutrality, the following measures deserve consideration.

- 1) To advertise its neutral management policy to the shipping world through port sales activities
- 2) To change the composition of shareholders (to achieve more diversity)
- 3) To establish a neutral committee, for example PPRC, to guide and supervise SPS

(4) Improvement of the facilities and equipment of the conventional port

Some facilities of the conventional terminal, including the east breakwater, oil terminal and berths 1, 2, 3, require immediate repair. In addition some cargo equipment is showing the effects of aging. There is a plan to improve the conventional terminal facilities and cargo handling equipment. Some of the repair work of the facilities have already started but most of the improvement work of the handling equipment has not started because a new concession agreement of the conventional terminal isn't finalized. Greater efficiency of the conventional terminal is strongly required by port users, and therefore all improvement work should be started as soon as possible.

(5) Enhancement of user-friendliness

A "Port Users Meeting" to exchange opinions between the port management body and port users is currently held each month. Such meetings, which are attended by shipping agents, traders, shippers, customs and ROP, are useful in making a port user-friendly. However users claim that they don't receive a clear reply from SPS to their requests. Therefore, it would be a good idea for a government representative to attend the meeting in order to coordinate between SPS and the port users from a neutral position.

As mentioned before, port productivity and charges influence industries and new investment. The conventional terminal is especially important. In order to be competitive with conventional terminals of other ports, especially Port Sultan Qaboos, Port Salalah should provide higher productivity than Port Sultan Qaboos and attractive port charges, which are less than Port Sultan Qaboos.

## 15.3 Port Management Scheme

### 15.3.1 Container Terminal Utilization

There are three types of terminal utilization, which are "Open use (Public use)", "Prioritized use" and "Exclusive use". Generally, each type has some merits and demerits. In major Japanese ports, "Public use" is adopted in "public terminals" and "Exclusive use" is employed in "semi-public terminals". Table 15.3.1 indicates types of container terminal utilization by shipping companies.

Both the port of Singapore and the port of Hong Kong, which are the largest container hub ports in the world and have high ratios of transshipment, basically adopt "Open (Public) use" system. Under this system plural shipping companies can use the berth, resulting in high productivity and competitive terminal charges.

### 15.3.2 Container Terminal Development Scheme

Concerning the new container terminal development, basic idea is as follows.

- The degree to which the private sector can participate is important. As private investment increases, the financial burden of the public sector is reduced. But the private sector is often unwilling to make a large investment because of the substantial risk involved.
- The sole management body is assumed to be SPS, while measures to guarantee the neutrality of SPS should be undertaken.
- From the viewpoint of efficient use of port facilities and equipment, a single operator system (by SPS) is optimum. Existence of competitive container transshipment ports, Aden, Dubai and other ports, encourages competition with the Salalah Port to avoid the demerits of monopoly. But a third company operation should also be considered if it is necessary to attract a new shipping company.
- In order to set reasonable port charges, high productivity and a large cargo throughput are essential for a transshipment port. To achieve this, "Open use" system is usually appropriate, and under this system small shipping companies can also use the terminals. But a large shipping company may request to use a terminal exclusively to maximize efficiency. In this case "Prioritized use" system should be introduced to attract shipping companies. SPS can use "Prioritized use" system as a tool for attracting and negotiating with shipping companies.

Table 15.3.1 Types of Container Terminal Utilization by Shipping Companies

Types	"Open" Use (Public use)	"Prioritized" Use	"Exclusive" Use
1. Definition	"First come, first served" base (Grant the use of the facilities as appropriate)	"Specific shipping companies" are given priorities over tariff & available time on certain conditions such as cargo volumes.	Specific shipping company exclusively leases a terminal only for its own fleets & alliance.
2. Examples	<ul style="list-style-type: none"> <li>• Japanese public terminals</li> <li>• Pusan (South Korea)</li> <li>• Hong Kong</li> <li>• Major European Ports (Hamburg, Antwerp, Felixstowe)</li> <li>• New York/New Jersey (U.S.)</li> <li>• Singapore</li> </ul>	<ul style="list-style-type: none"> <li>• Some terminals at Gaoxiong (Chinese Taipei)</li> <li>• Some U.S. Ports (Miami, Evergrace &amp; others)</li> <li>• ECT (Dedicated Terminal) at Rotterdam Port</li> </ul>	<ul style="list-style-type: none"> <li>• Japanese semi-public terminal (Tokyo, Kobe, Yokohama)</li> <li>• Gaoxiong (Chinese Taipei)</li> <li>• Major U.S. ports (Los Angeles, Long Beach, Seattle)</li> </ul>
3. Particularities	<ul style="list-style-type: none"> <li>① Increase of "utilization rate" can be expected.</li> <li>② Improvement of productivity can be expected through competition when plural terminal operators exist</li> </ul>	<ul style="list-style-type: none"> <li>① This type is very flexible for users.</li> <li>② Compared with "exclusive use", increase of utilization rate can be expected.</li> </ul>	<ul style="list-style-type: none"> <li>① A shipping company can exclusively use without interference of other lines.</li> <li>② This type is possible at a port which has "certain cargo volumes" and can be leased with appropriate prices.</li> </ul>

Based on the above, six cases are considered as follows.(See table15.3.2)

- (Case-1)GSO provides all facilities (infrastructure and superstructure). Terminal management and operation is conducted by SPS. Basic berth allocation is “Open use” system, but “Prioritized use” system will be considered if requested by shipping companies.
- (Case-2)GSO provides infrastructure while SPS provides superstructure. Terminal management and operation is conducted by SPS. Basic berth allocation is “Open use” system, but “Prioritized use” system would be considered if requested by shipping companies.
- (Case-3)GSO provides infrastructure while a third company provides superstructure. Terminal management is conducted by SPS while the terminal operator is the third company. Basic berth allocation is “Open use” system, but “Prioritized use” system would be considered if requested by shipping companies.
- (Case-4) GSO provides infrastructure while a third company provides superstructure. Terminal management is conducted by SPS while the terminal operator is the third company. “Exclusive use” system is adopted when strongly requested by shipping companies.
- (Case-5)SPS provides superstructure and a part of infrastructure(for example berths). Terminal management and operation is conducted by SPS. Basic berth allocation is “Open use” system, but “Prioritized use” system would be considered if requested by shipping companies.
- (Case-6) A third company provides superstructure and a part of infrastructure(for example berths). Terminal management is conducted by SPS while the terminal operator is the third company. Basic berth allocation is “Open use” system, but “Prioritized use” system would be considered if requested by shipping companies.

Table 15.3.2 Comparison of Container Terminal Development Patterns

	Existing terminals	New terminals					
		Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Planning	GSO/SPS	GSO	GSO/SPS	GSO/3 <sup>rd</sup> party	GSO/3 <sup>rd</sup> party	GSO/SPS	GSO/SPS
Management	SPS	SPS	SPS	SPS	SPS	SPS	SPS
Concessionaire	SPS	SPS	SPS	3 <sup>rd</sup> party	3 <sup>rd</sup> party	SPS	3 <sup>rd</sup> party
Construction							
Channel/Anchorage	GSO	GSO	GSO	GSO	GSO	GSO	GSO
Breakwater	GSO	GSO	GSO	GSO	GSO	GSO	GSO
Reclamation	GSO	GSO	GSO	GSO	GSO	SPS	3 <sup>rd</sup> party
Berthing Facilities	GSO	GSO	GSO	GSO	GSO	SPS	3 <sup>rd</sup> party
Terminal facilities	SPS	SPS	3 <sup>rd</sup> party	3 <sup>rd</sup> party	3 <sup>rd</sup> party	SPS	3 <sup>rd</sup> party
Cargo Handling Equipment	SPS	SPS	3 <sup>rd</sup> party	3 <sup>rd</sup> party	3 <sup>rd</sup> party	SPS	3 <sup>rd</sup> party
Ownership							
Land	GSO	GSO	GSO	GSO	GSO	SPS*	3 <sup>rd</sup> party*
Terminal facilities	SPS*	SPS*	3 <sup>rd</sup> party*	3 <sup>rd</sup> party*	3 <sup>rd</sup> party*	SPS*	3 <sup>rd</sup> party*
Cargo Handling Equipment	SPS*	SPS*	3 <sup>rd</sup> party*	3 <sup>rd</sup> party*	3 <sup>rd</sup> party*	SPS*	3 <sup>rd</sup> party*
Terminal Operation	SPS	SPS	3 <sup>rd</sup> party	3 <sup>rd</sup> party	3 <sup>rd</sup> party	SPS	3 <sup>rd</sup> party
Berth Allocation	Open	Open (Prioritized)	Open (Prioritized)	Open (Prioritized)	Exclusive	Open (Prioritized)	Open (Prioritized)

Note: \*:Transferred to GSO after concession period

An evaluation of above cases is made as follows.

- In case 1, GSO can improve facilities and equipment easily in case of need of development, because investment by SPS is not required. But GSO must bear all investment costs by itself which involves a substantial risk. Private participation is limited to operation.
- From the viewpoint of lessening the government's financial burden, case 5 or 6 is favorable for the government. But in these cases, the private sector must make a large investment which involves a substantial risk. Furthermore the private sector would own the land although a port is a public asset.
- From the viewpoint of efficient use of port facilities and equipment, the single operator system by SPS is considered preferable. But in this system shipping companies can't use their preferred terminal operators. Moreover, present SPS is under the influence of Maersk-Sealand. To overcome this potential problem, the organization of SPS must foster an image of neutrality to attract various shipping companies. If, despite these efforts, a third company operation is the only way to attract a new shipping company, then a third company operation should be introduced.
- For efficient utilization of berths, "Open use" system should be adopted as a basic scheme. But the first priority is to attract as many shipping companies as possible. Therefore the berth allocation system should be flexible and "Prioritized use" system also should be adopted if it will attract shipping companies.
- Considering above mentioned points, case 2 is considered to be preferable. But to satisfy the needs and requests of shipping companies, case 3 and 4 are also possible. To attract as many shipping companies as possible is the most important objective and to achieve this target Port Salalah needs flexibility in its operation system.

### 15.3.3 Port Development and Management

The sole management body of Salalah Port including container and conventional terminals is assumed to be SPS because it is generally agreed that a single body can manage port activities more efficiently.

Conventional terminals cater for the needs of the region. Conventional terminals are generally difficult to make profitable. Therefore, to support regional development, GSO should develop necessary infrastructure and set reasonable concession conditions which will allow SPS to offer low port charges. SPS should operate and maintain the conventional terminal based on the concession with the government.

Port development and management scheme of container terminal and conventional terminal is shown in Table 15.3.3.

**Table 15.3.3 Port Development and Management Scheme**

		Construction Procurement	Maintenance	Management	Operation
Existing Container Terminal	Infrastructure	GSO	SPS	SPS	SPS
	Superstructure	SPS			
Additional Container Terminal	Infrastructure	GSO	SPS(3 <sup>rd</sup> Party)	SPS	SPS(3 <sup>rd</sup> Party)
	Superstructure	SPS(3 <sup>rd</sup> Party)			
Existing Conventional Terminal	Infrastructure	GSO*	SPS	SPS	SPS
	Superstructure	GSO,SPS*			
Additional Conventional Terminal	Infrastructure	GSO	SPS	SPS	SPS
	Superstructure	SPS			

Note: \* Including rehabilitation work



## 15.4 Port Marketing Strategy

### 15.4.1 Port Sales

As a new comer to the transshipment business world, it is necessary for Port Salalah to promote its name, superior location and the capacity of its facilities. Salalah is quite a new name : even in the shipping world many people don't know its location and whether it is a conventional port or a container port. And those who know Port Salalah has container handling facilities are unfamiliar with its actual container handling capacity.

Port sales activities are, therefore, very important to the future development of Port Salalah and SPS must play the main role in conducting these activities. But the Omani Government also should support and join these activities because the development of Port Salalah benefits not only SPS but also the Dhofar region and the government. Furthermore the people in the shipping business are interested in government policy on port development. The government can enhance the social/economic stability of the country by activity pursuing such kinds of development, and this in turn instills confidence in would-be customers.

To this end, the following measures are recommended.

#### (1) Web Site of Port Salalah

The internet has become one of the defining symbols of our era, and many people from all over the world use it daily to exchange information. Therefore a web site is an essential means of spreading information about Port Salalah. Existing web site of SPS is compiled from the viewpoint of a container terminal operator. The pages mainly give a general outline of the terminal, its facility, and calling vessels. More specific information about the strategic location of Salalah and its other advantages over competitive ports should be added.. At the same time, it is important that web site visitors come away with the impression that Port Salalah is open for all customers who want to utilize its facilities and that all customers will receive equal treatment.

#### (2) Sales Promotion Materials

Printed brochure is an effective means of promotion. A well-conceived brochure can give prospective customers a solid understanding port sales points as well as an outline of its facilities. Since there are various types of potential customers, several brochures appropriate for each target audience should be made.

Video is also a very useful material and sometimes more effective than brochures. It can be used in port sales seminars and shown to port visitors. It can also be used as an initiation tool for new

employees and vocational trainees. It is advisable to take and keep historical film records of the port development which can be used in a promotion video.

### (3)Port Sales Mission

Meeting the key personnel of the industries related to ports and trade, such as trading firms, shipping lines, waterfront business companies is a good way to promote the Port. It is necessary for a Port Salalah Sales Missions to be dispatched regularly to the cities and regions which are strategically important to Port Salalah. It is desirable that this mission is formed by SPS and the government. In short, this mission is necessary to sell the name of the Port so that the shippers and consignees will become familiar with the name of Salalah as a transshipment port or direct destination or loading port.

### (4)Setting up of Port Sales Offices abroad

SPS has had a representative at Dubai, whose main duty is providing accurate information of Port Salalah and attracting ships and cargoes to Port Salalah. Setting up offices in various cities is a common practice of major port authorities. In addition to the office in Dubai, setting up offices in South Asia and East or South Africa, which comprise the main feeder network area, should be considered in order to promote the Port.

## 15.4.2 Marketing Strategy

### (1)Port Tariffs

In selecting a port, shipping companies naturally consider port tariffs. Tariffs are mostly decided under the negotiation between port management bodies and shipping companies. Some ports don't even issue tariff tables. Therefore it is difficult to compare actual tariff levels among each port. Dubai Port is the biggest transshipment hub in the surrounding region while Singapore Port is also a major competitor of Port Salalah as mentioned in Chapter 13.3. The study team compares loading and discharging charges of a container of Port Salalah with those of Dubai Ports and Singapore Port based on each tariff table.

Compared with Dubai Ports, the tariff level of Port Salalah is about 4% is higher. But Salalah is much closer to the main East-West shipping route than Dubai and enjoys an approximately 3 day advantage in deviation over Dubai. Therefore, the present tariff level of Port Salalah is sufficiently competitive with Dubai Ports.

Compared with Singapore Port, charges of loading and discharging of laden 20 feet container are about 7 % higher at Port Salalah. But Port Salalah offers a very low volume discount rate, for example, more than 50 % discount in average for over 200 thousand movements per year.

Though Singapore Port doesn't publish its volume discount rate, it is said that the volume discount is only about 10 % for over 400 thousand movements per year. Therefore it can be said that Port Salalah can compete with Singapore Port at the tariff levels for large class shipping companies. But Port Salalah aims at being a common user port and to achieve this target it must attract various shipping companies including middle and small class shipping companies. From this view point, the scheme of standard charge levels and volume discount rate should be revised. Namely, standard tariffs should be reduced while volume discount rate should be increased from the present level.

**Table 15.4.1 Comparison of Loading and Discharging Charges of Container**

(Unit: US\$)

	Port Salalah	Dubai Ports	Singapore Port
Transshipment			
20' Laden	140.00	138.04	131.10
20' Empty	98.00	93.48	131.10
40' Laden	200.00	192.39	199.50
40' Empty	140.00	134.24	199.50
Import / Export			
20' Laden	109.00	107.33	85.50
20' Empty	63.00	59.78	45.60
40' Laden	165.00	158.97	122.55
40' Empty	85.00	81.52	67.26

Note : 1 Dhs. is equivalent to 3.68 US dollars, 1S\$ is equivalent to 0.57 US dollars

Source : Tariff of Port Salalah 1999, Tariff of Dubai Ports 1999, PSA Price List 1997

**Table 15.4.2 Volume Discount of Loading and Discharging Charges of Container at Port Salalah**

(Unit: US\$)

	Standard(A)	More than 200 thousand Moves(B)	(B) / (A)
Transshipment			
20' Laden	140.00	70.40	0.50
20' Empty	98.00	62.40	0.64
40' Laden	200.00	75.50	0.38
40' Empty	140.00	66.40	0.47
Import / Export			
20' Laden	109.00	56.00	0.51
20' Empty	63.00	44.00	0.70
40' Laden	165.00	63.00	0.38
40' Empty	85.00	53.00	0.62

Source : Tariff of Port Salalah 1999

## (2) Network of Shipping Lines

Port Salalah must have not only trunk lines but also sufficient feeder service network to achieve success as a world class transshipment hub port. Port Salalah has seven trunk lines including Mediterranean Shipping Company's East Africa-Red Sea-Mediterranean route which recently SPS succeeded in attracting. It also has eight weekly feeder services and four alternate week services. Feeder service network covers Arabian & Persian Gulf, Lower Gulf, Red Sea, South Africa, East Africa, Indian Ocean/Islands, and South India. Given that Singapore Port has more than 50 feeder lines, Port Salalah must expand its feeder network in order to be a world class transshipment hub port.

Main prospective market areas of hinterland development are the Indian Ocean Rim, particularly, Yemen, East Africa countries, Pakistan, India and Sri Lanka besides the United States, Europe, South-East Asia and Far East countries. From this viewpoint to increase trunk lines and to expand feeder network, especially from/to East Africa and Indian Sub-Continent, is very important.

## (3) User Friendly Management

One of the most effective ways in which PSA communicates with its customers is through the advisory council which it has set up with shipping companies calling PSA. Through this channel PSA shows the shipping world that Singapore is a multi user terminal and user friendly port. Shipping companies set a high value on PSA's attitude.

Port Salalah is expected to be used various shipping companies as Singapore Port. It is recommended that SPS forms a similar council with shipping companies calling Salalah. Through direct communication with shipping companies, SPS can impress upon users that they will be treated equally in any service. This type of user friendly management may also encourage other shipping companies to use the port.

## (4) Introducing Modernized Facilities

Salalah port must take advantage of its new port status. Salalah boasts the most modern facilities and operating systems, and these are good tools of port sales. SPS has already installed super post panamax quay cranes with 22 rows which are world largest class cranes at present. SPS also should develop large depth quays, for example 18 meter quays, to give itself further advantages over competing ports.

(5) Increase of Base Cargo

Salalah is relying heavily on transshipment cargo at present but transshipment cargo always has the possibility of moving to another port if shipping companies deem it more profitable. But cargo from/to hinterland will always use Port Salalah. To have such base cargo is very important. Development of the hinterland will raise the status of Port Salalah. SPS should make efforts to develop its hinterland and to increase base cargo.