

Appendix 7

Alternative Fleet Development Programmes

1) Current Fleet for Coastal Shipping

Today, Vietnamese general cargo fleet comprises 422 vessels which are equivalent to 685,000 DWT as shown in Table A7.1. Small vessels less than 2,000 DWT are dominant in terms of the number of vessels (83% of the total) but subordinate in terms of fleet capacity (25% of the total DWT). Average ship age of medium and large vessels is about 20 years. This means the current fleet could be replaced with new ones in the near future.

Table A7.1

VIETNAMESE FLEET

(except Tankers and Refrigerated Ships)

Ship Size (DWT)	Nos of Ships	Total DWT	Average DWT	Average Ship Age
Less than 500	261	68,940	264	7.8
500 - 1,999	90	93,707	1,041	11.8
2,000 - 3,999	22	63,134	2,870	17.9
4,000 - 6,999	23	117,543	5,111	21.4
More than 7,000	26	342,078	13,157	20.4
Total	422	685,402	1,624	10.7

Note: (1) Average age estimated in 1995.

Source: VIRES 1994-1995. Type General Cargo Vessels

Many larger vessels are assigned on both domestic and international shipping routes and therefore we must estimate the fleet size required to serve coastal shipping based on presumed operating conditions instead of counting the actual number of vessels.

From analysis of the latest operation records and related data, the Study assumes the current coastal shipping fleet composition as shown in Table A7.2. Most of the vessels ranging from 500 to 2,000 DWT are engaged in coastal shipping and they account for 43% of the assumed fleet capacity (DWT). On the other hand, the vessels less than 500 DWT mainly serve within both delta areas, while vessels more than 2,000 DWT serve overseas shipping. Furthermore, vessels more than 7,000 DWT are rarely assigned to coastal shipping. Consequently, 19% of the Vietnamese fleet in terms of DWT is considered to be assigned to coastal shipping.

Table A7.2
ASSUMED FLEET COMPOSITION FOR COASTAL SHIPPING IN 1995

Ship Size (DWT)	Total Registered DWT	Assumed Assignment Rate for Coastal Shipping	Available DWT for Coastal Shipping
Less than 500	68,940	20%	13,788
500 - 1,999	93,707	70%	65,595
2,000 - 3,999	63,134	25%	15,784
4,000 - 6,999	117,543	15%	17,631
More than 7,000	342,078	5%	17,104
Total	685,402	19%	129,902

Source: JICA Study Team

2) Current Operational Characteristics

According to the traffic assignment of the 1995 O-D matrices (Supplementary Report on Port Survey and Demand Forecast), the average trip distance of all dry cargoes is estimated at 673 miles. However sailing speed and port handling time vary from small to large vessels. Table A7.3 calculates necessary days for one trip by various sizes of vessel assigned on average length routes. It is generally expected that larger vessels achieve comparatively high sailing speeds but spend longer in port (although handling rates per tonne should be higher for larger vessels with efficient port handling).

Table A7.3
NECESSARY OPERATION DAYS FOR ONE TRIP BY SHIP SIZE IN 1995

Ship Size (DWT)	Sailing Speed (knot)	Necessary Days for One Trip		
		Total	At Sea	At Port
Less than 500	6	7.7	4.8	2.8
500 - 1,999	8	6.7	3.7	3.0
2,000 - 3,999	8	9.7	3.7	6.0
4,000 - 6,999	10	11.9	2.9	9.0
More than 7,000	10	18.9	2.9	16.0

Source: JICA Study Team

The Study observed that current coastal shipping suffers from inefficient operation attributable to low number of commission days and low occupancy rate as follows:

- The number of commission days is estimated at around 300 days annually. Lack of traffic, repair and maintenance work and tropical cyclones reduce the operational days considerably. The problem is magnified by use of aged vessels.
- The occupancy rate is estimated at only 50 - 60%. This can mainly be explained by unbalanced or directional traffic flows, but also by the need for frequent replenishment of fuel and food supplies.

Taking the above-mentioned conditions into account, Table A7.4 estimates the volume of current dry cargo shipping activity by ship size. Total current shipping activity is estimated at 1,616 million ton-miles, which is almost equal to the estimate obtained from the dry cargo traffic assignment (1,596 million ton-miles in the Supplementary Report on Port Survey and Demand Forecast).

Table A7.4
SHIPPING ACTIVITY BY VESSEL SIZE IN 1995

Vessel Size (DWT)	Average Loaded Cargo during Navigation (ton) (A)	Average Annual Navigation Length (mile/year/vessel) (B)	Shipping Activity (000 ton-mile) (A) x (B)
Less than 500	6,894	26,922	185,600
500 - 1,999	32,798	30,940	1,014,755
2,000 - 3,999	7,892	21,371	168,655
4,000 - 6,999	8,816	17,420	153,570
More than 7,000	8,552	10,968	93,798
Total	64,952	-	1,616,378

Note: (A) = (available DWT for coastal shipping) x (occupancy rate)
(B) = (average commission days) / (necessary days for one trip) x (average trip distance)

Source: JICA Study Team

3) Future Fleet Alternatives

The actual vessel capacity for coastal shipping in Vietnam is far below that required to meet future demand. Capacity expansion as well as modernization are badly needed. Because of their lower operating costs, increased use of larger vessels seems likely in future years. Current coastal shipping operators prefer small vessels ranging from 500 to 2,000 DWT while middle size vessels (2,000 - 7,000 DWT) are only assigned on trunk routes such as the Haiphong Port - Saigon Port Route. It is reasonable to expect that intensified traffic demand on the main routes would encourage use of larger vessels.

With consideration of traffic demand and vessel type in future, the Study preliminarily assigns vessels on both major and routes as shown in Table A7.5.

Table A7.5
VESSEL ASSIGNMENT PLAN

Major O-D Pairs by Traffic Demand (mil. ton-mile)	Possible Vessels to be Assigned				
	Average 300 DWT	Average 1,000 DWT	Average 3,000 DWT	Average 5,000 DWT	Average 10,000 DWT
4 - 19	x				
20 - 49	x	x			
50 - 99	x	x	x		
100 - 399	x	x	x	x	
More than 400	x	x	x	x	x

On the basis of this vessel assignment plan, the forecast traffic demand expected to be carried by each vessel type is shown in Tables A7.6 and A7.7 for three alternative future fleet development patterns. These traffic estimates are derived from the overall traffic forecasts described in the supplementary report on Traffic Demand Analysis and Forecast, assuming the Dung Quat project is implemented. The alternative future fleet compositions are as follows:

ALTERNATIVE 1 - Expansion of the coastal shipping fleet with the same size and type of vessels as used at present, using new vessels less than 1,000 dwt and second-hand vessels above this size (similar to current practice). Under this alternative the average size of coastal shipping vessels remains at about 1,000 dwt.

ALTERNATIVE 2 - Expansion of the fleet with larger more modern designs, including specialised vessels, to minimise total overall operating costs (including both running and capital costs). All vessel replacements are assumed to be with new ships. Under this alternative the average size of vessels increases by 2010 to 2,000 dwt.

ALTERNATIVE 3 - An intermediate situation in which less of the larger vessels are acquired, all vessels below 3,000 dwt are acquired new and the rest second-hand. Under this alternative the average size of vessels increases by 2010 to 1,500 dwt.

The total number of vessels and dwt capacity requirements for each alternative are estimated in Tables A7.8, A7.9 and A7.10, assuming the traffic-carrying potential of general cargo vessels is given as in Table 11, and assuming that the Dung Quat project is implemented. Based on the current fleet age distribution described in Table A7.12, assuming that vessels are retired at the age of 20 years, the number of general cargo ship acquisitions has been estimated in Tables A7.13, A7.14 and A7.15.

The capital cost of the acquisitions has been estimated for general cargo ships in Tables A7.13, A7.14 and A7.15 assuming the prices given in Table A7.16. The total costs of cargo ships, including specialised ships, are given in Tables A7.17, A7.18 and

A.19. The assumed prices for general cargo vessels up to 3,000 dwt are based on anticipated costs for constructing vessels in Vietnam using imported Japanese machinery. Other vessel prices are assumed to be imported and are therefore estimated from international construction costs. Prices for second-hand vessels about 12 years old are estimated from new vessel prices allowing for depreciation over a 20 year life.

In practice, current prices for new locally built small vessels in Vietnam are lower than the new vessel prices assumed above - about VND 4 billion for a 600 dwt vessel compared to between VND 7 and 25 billion assumed in Table A7.16. The locally built vessels are lower in price because they use second-hand engines and other equipment (often from former East Germany) and the specifications of local vessels are not as high as those built in other countries. Supplies of spares for such obsolete second-hand equipment are not likely to continue for many years and the life of locally built vessels is not expected to be as long as 20 years. Raising specifications of ships to meet international safety standards will also increase future prices of locally built ships. Therefore it is considered reasonable to use the assumed prices for estimating future financial requirements.

Table A7.6
TRAFFIC CARRIED BY EACH VESSEL TYPE IN 2000 (THOUSAND TON MILES)

Vessel Type	Alternative 1	Alternative 2	Alternative 3
General Cargo/bulk			
300 dwt	384,912	188,082	380,538
1,000 dwt	2,140,147	809,553	839,260
3,000 dwt	320,550	659,794	609,045
5,000 dwt	304,850	471,790	522,600
10,000 dwt	109,680	118,820	109,680
Total General Cargo	3,260,139	2,248,039	2,461,123
Cement Carrier			
5,000 dwt		699,016	699,016
7,000 dwt			
Coal/Ore Carrier			
1,000 dwt		71,028	
3,000 dwt		142,056	
Semi-Container			
2,000 dwt		100,000	100,000
Full Container			
5,000 dwt			
Ro-Ro Ship			
5,000 dwt			
Oil Tanker ¹			
Crude Oil Tanker			
80,000 dwt	1,701,000	1,701,000	1,701,000
	(0)	(0)	(0)
Refined Oil Tanker			
1,000 dwt	0	0	0
	(14,000)	(14,000)	(14,000)
2,300 dwt	417,571	417,571	417,571
	(0)	(0)	(0)
3,000 dwt	0	0	0
	(16,000)	(16,000)	(16,000)
20,000 dwt	1,396,224	1,396,224	1,396,224
	(0)	(0)	(0)
Total Specialised Vessels	3,514,795	4,526,895	4,313,811
	(30,000)	(1,042,100)	(829,016)
TOTAL	6,774,934	6,774,934	6,774,934
	(3,290,139)	(3,290,139)	(3,290,139)

NOTE: (1) The figures in brackets refer to the situation without the Dung Quat project.

SOURCE: JICA TEAM

Table A7.7
TRAFFIC CARRIED BY EACH VESSEL TYPE IN 2010 (THOUSAND TON MILES)

Vessel Type	Alternative 1	Alternative 2	Alternative 3
General Cargo/bulk			
300 dwt	1,049,760	367,415	704,214
1,000 dwt	5,396,398	1,089,335	1,977,562
3,000 dwt	1,103,861	798,698	1,458,492
5,000 dwt	958,100	1,299,450	1,205,194
10,000 dwt	109,680	356,460	219,360
Total General Cargo	8,617,799	3,911,358	5,564,822
Cement Carrier			
5,000 dwt		2,284,361	2,284,361
7,000 dwt		518,616	518,616
Coal/Ore Carrier			
1,000 dwt		447,220	
3,000 dwt		1,006,244	
Semi-Container			
2,000 dwt		100,000	100,000
Full Container			
5,000 dwt		200,000	
Ro-Ro Ship			
5,000 dwt		150,000	150,000
Oil Tanker ¹			
Crude Oil Tanker			
80,000 dwt	3,402,000 (0)	3,402,000 (0)	3,402,000 (0)
Refined Oil Tanker			
1,000 dwt	0 (14,000)	0 (14,000)	0 (14,000)
2,300 dwt	838,124 (0)	838,124 (0)	838,124 (0)
3,000 dwt	0 (16,000)	0 (16,000)	0 (16,000)
20,000 dwt	2,802,470 (0)	2,802,470 (0)	2,802,470 (0)
Total Specialised Vessels	7,042,594 (30,000)	11,749,035 (4,736,441)	10,095,571 (3,082,977)
TOTAL	15,660,393 (8,647,799)	15,660,393 (8,647,799)	15,660,393 (8,647,799)

NOTE: (1) The figures in brackets refer to the situation without the Dung Quat project.

SOURCE: JICA TEAM

Table A7.8
FLEET DEVELOPMENT PLAN - ALTERNATIVE 1

Ship Type · Size/Year	1995	2000	2010
Bulk Ship/General Cargo Ship			
300 DWT	46 Ships (13,788 DWT)	88 Ships (26,400 DWT)	240 Ships (72,000 DWT)
1,000 DWT	66 Ships (65,595 DWT)	123 Ships (123,000 DWT)	322 Ships (322,000 DWT)
3,000 DWT	5 Ships (15,784 DWT)	10 Ships (30,000 DWT)	30 Ships (90,000 DWT)
5,000 DWT	4 Ships (17,631 DWT)	7 Ships (35,000 DWT)	22 Ships (110,000 DWT)
10,000 DWT	2 Ships (17,104 DWT)	2 Ships (20,000 DWT)	2 Ships (20,000 DWT)
Sub-total	123 Ships (129,902 DWT)	230 Ships (234,400 DWT)	616 Ships (614,000 DWT)
Oil Tanker			
Crude Oil Tanker			
80,000 DWT	0 Ship	1 Ship (80,000 DWT)	2 Ships (160,000 DWT)
Refined Oil Tanker			
2,300 DWT	0 Ship	2 Ships (4,600 DWT)	4 Ships (9,200 DWT)
20,000 DWT	0 Ship	3 Ships (60,000 DWT)	6 Ships (120,000 DWT)
Sub-Total	0 Ship	6 Ships (144,600 DWT)	12 Ships (289,200 DWT)
ENTIRE COASTAL SHIPPING	123 Ships	236 Ships	628 Ships
FLEET	(129,902 DWT)	(379,000 DWT)	(903,200 DWT)

Table A7.9
FLEET DEVELOPMENT PLAN - ALTERNATIVE 2

Ship Type · Size/Year	1995	2000	2010
Bulk Ship/General Cargo Ship			
300 DWT	46 Ships (13,788 DWT)	43 Ships (12,900 DWT)	84 Ships (25,200 DWT)
1,000 DWT	66 Ships (65,595 DWT)	47 Ships (47,000 DWT)	65 Ships (65,000 DWT)
3,000 DWT	5 Ships (15,784 DWT)	19 Ships (57,000 DWT)	23 Ships (69,000 DWT)
5,000 DWT	4 Ships (17,631 DWT)	10 Ships (50,000 DWT)	27 Ships (135,000 DWT)
10,000 DWT	2 Ships (17,104 DWT)	2 Ships (20,000 DWT)	6 Ships (60,000 DWT)
Sub-Total	123 Ships (129,902 DWT)	121 Ships (186,900 DWT)	205 Ships (354,200 DWT)
Cement Carrier			
5,000 DWT	0 Ship	4 Ships (20,000 DWT)	14 Ships (70,000 DWT)
7,000 DWT	0 Ship	0 Ship	2 Ships (14,000 DWT)
Sub-Total	0 Ship	4 Ships (20,000 DWT)	16 Ships (84,000 DWT)
Coal/Ore Carrier			
1,000 DWT	0 Ship	3 Ships (3,000 DWT)	20 Ships (20,000 DWT)
3,000 DWT	0 Ship	2 Ships (6,000 DWT)	15 Ships (45,000 DWT)
Sub-Total	0 Ship	5 Ships (15,000 DWT)	35 Ships (65,000 DWT)
Semi-Container Ship			
2,000 DWT	0 Ship	2 Ships (4,000 DWT)	2 Ships (4,000 DWT)
Full-Container Ship			
5,000 DWT	0 Ship	0 Ship	2 Ships (10,000 DWT)
Ro-Ro Ship			
5,000 DWT	0 Ship	0 Ship	2 Ships (10,000 DWT)
Oil Tanker			
Crude Oil Tanker 80,000 DWT	0 Ship	1 Ship (80,000 DWT)	2 Ships (160,000 DWT)
Refined Oil Tanker 2,300 DWT	0 Ship	2 Ships (4,600 DWT)	4 Ships (9,200 DWT)
20,000 DWT	0 Ship	3 Ships (60,000 DWT)	6 Ships (120,000 DWT)
Sub-Total	0 Ship	6 Ships (144,600 DWT)	12 Ships (289,200 DWT)
ENTIRE COASTAL SHIPPING FLEET	123 Ships (129,902 DWT)	138 Ships (370,500 DWT)	276 Ships (826,400 DWT)

Table A7.10
FLEET DEVELOPMENT PLAN - ALTERNATIVE 3

Ship Type · Size/Year	1995	2000	2010
Bulk Ship/General Cargo Ship			
300 DWT	46 Ships (13,788 DWT)	87 Ships (26,100 DWT)	161 Ships (48,300 DWT)
1,000 DWT	66 Ships (65,595 DWT)	50 Ships (50,000 DWT)	118 Ships (118,000 DWT)
3,000 DWT	5 Ships (15,784 DWT)	19 Ships (57,000 DWT)	42 Ships (126,000 DWT)
5,000 DWT	4 Ships (17,631 DWT)	12 Ships (60,000 DWT)	28 Ships (140,000 DWT)
10,000 DWT	2 Ships (17,104 DWT)	2 Ships (20,000 DWT)	4 Ships (40,000 DWT)
Sub-Total	123 Ships (129,902 DWT)	170 Ships (213,100 DWT)	353 Ships (472,300 DWT)
Cement Carrier			
5,000 DWT	0 Ship	4 Ships (20,000 DWT)	14 Ships (70,000 DWT)
7,000 DWT	0 Ship	0 Ship	2 Ships (14,000 DWT)
Sub-Total	0 Ship	4 Ships (20,000 DWT)	16 Ships (84,000 DWT)
Semi-container Ship			
2,000 DWT	0 Ship	2 Ships (4,000 DWT)	2 Ships (4,000 DWT)
Ro-Ro Ship			
5,000 DWT	0 Ship	0 Ship	2 Ships (10,000 DWT)
Oil Tanker			
Crude Oil Tanker			
80,000 DWT	0 Ship	1 Ship (80,000 DWT)	2 Ships (160,000 DWT)
Refined Oil Tanker			
2,300 DWT	0 Ship	2 Ships (4,600 DWT)	4 Ships (9,200 DWT)
20,000 DWT	0 Ship	3 Ships (60,000 DWT)	6 Ships (120,000 DWT)
Sub-Total	0 Ship	6 Ships (144,600 DWT)	12 Ships (289,200 DWT)
ENTIRE COASTAL SHIPPING FLEET	123 Ships (129,902 DWT)	182 Ships (381,700 DWT)	385 Ships (859,500 DWT)

Table A7.11
EXPECTED TRAFFIC CARRIED BY VESSEL SIZE
(GENERAL CARGO/BULK VESSELS)
(Thousand ton miles per year)

Size of Vessel	New Vessel	Old Vessel
300 dwt	4,374	4,038
1,000 dwt	16,759	15,470
3,000 dwt	34,726	32,055
5,000 dwt	47,179	43,550
10,000 dwt	59,410	54,840

NOTE: (1) New vessels ranging from 0 to 11 years old, Old vessels ranging from 12 to 20 years.

Table A7.12
DISTRIBUTION OF AGE OF GENERAL CARGO VESSELS BY CAPACITY

Age category	Capacity of Vessels (dwt)												Total
	0-199	200-299	300-499	500-999	1000-1999	2000-2999	3000-3999	4000-4999	5000-6999	7000-9999	10000-14999	15000-	
I	3	31	28	8	8	0	1	0	0	0	0	0	79
II	39	48	53	7	20	0	1	1	0	0	1	1	171
III	7	5	25	7	12	2	2	3	2	0	0	0	65
IV	3	0	0	5	9	9	0	1	5	2	4	4	42
V	11	3	3	1	9	2	3	4	4	5	3	4	52
VI	1	0	1	1	3	0	2	3	0	0	2	0	13
All	64	87	110	29	61	13	9	12	11	7	10	9	422

NOTE (1) Age categories are as follows:

- I built 1991 onwards
- II built 1986 - 1999
- III built 1981 - 1985
- IV built 1976 - 1980
- V built 1966 - 1975
- VI built before 1966

Table A7.13
GENERAL CARGO/BULK SHIP DEVELOPMENT PROGRAMME -
ALTERNATIVE 1

Vessel Type	Number of Vessels (dwt)			Acquisition Cost (US\$ mil)		
	Up to 2000	2001 to 2010	Total	Up to 2000	2001 to 2010	Total
300 dwt for replacement	0	41	41			
additional	42	152	194			
Sub-total	(12,600)	(45,600)	(58,200)			
	42	193	235	25.2	115.8	141.0
	(12,600)	(57,900)	(70,500)			
1,000 dwt for replacement	0	52	52			
additional	57	199	256			
Sub-total	(57,000)	(199,000)	(256,000)			
	57	251	308	131.1	577.3	708.4
	(57,000)	(251,000)	(308,000)			
3,000 dwt for replacement	5	14	19			
additional	5	20	25			
Sub-total	(15,000)	(60,000)	(75,000)			
	10	34	44	15.0	51.0	66.0
	(30,000)	(102,000)	(132,000)			
5,000 dwt for replacement	4	10	14			
additional	3	15	18			
Sub-total	(15,000)	(75,000)	(90,000)			
	7	25	32	19.6	70.0	89.6
	(35,000)	(125,000)	(160,000)			
10,000 dwt for replacement	2	2	4			
additional	0	0	0			
Sub-total	(20,000)	(20,000)	(40,000)			
	2	2	4	9.6	9.6	19.2
	(20,000)	(20,000)	(40,000)			
TOTAL	118	505	623	200.5	823.7	1,024.2
	(154,600)	(555,900)	(710,500)			

NOTE: (1) In addition tankers are required (see Table 17)

Table A7.14
GENERAL CARGO/BULK SHIP DEVELOPMENT PROGRAMME -
ALTERNATIVE 2

Vessel Type	Number of Vessels (dwt)			Acquisition Cost (US\$ mil)		
	Up to 2000	2001 to 2010	Total	Up to 2000	2001 to 2010	Total
300 dwt for replacement	0	41 (12,300)	41 (12,300)			
additional	0	41 (12,300)	41 (12,300)			
Sub-total	0	82 (24,600)	82 (24,600)		49.2	49.2
1,000 dwt for replacement	0	47 (47,000)	47 (47,000)			
additional	0	18 (18,000)	18 (18,000)			
Sub-total	0	65 (65,000)	65 (65,000)		149.5	149.5
3,000 dwt for replacement	5 (15,000)	0	5 (15,000)			
additional	14 (42,000)	4 (12,000)	18 (54,000)			
Sub-total	19 (57,000)	4 (12,000)	23 (69,000)	76.0	16.0	92.0
5,000 dwt for replacement	4 (20,000)	0	4 (20,000)			
additional	6 (30,000)	17 (85,000)	23 (115,000)			
Sub-total	10 (50,000)	17 (85,000)	27 (135,000)	100.0	170.0	270.0
10,000 dwt for replacement	2 (20,000)	0	2 (20,000)			
additional	0	4 (40,000)	4 (40,000)			
Sub-total	2 (20,000)	4 (40,000)	6 (60,000)	34.0	68.0	102.0
TOTAL	31 (127,000)	172 (226,600)	203 (353,600)	210.0	452.7	662.7

NOTE: (1) In addition tankers and other specialised vessels are required (see Table 18).

Table A7.15
GENERAL CARGO/BULK SHIP DEVELOPMENT PROGRAMME -
ALTERNATIVE 3

Vessel Type	Number of Vessels (dwt)			Acquisition Cost (US\$ mil)		
	Up to 2000	2001 to 2010	Total	Up to 2000	2001 to 2010	Total
300 dwt for replacement	0	41 (12,300)	41 (12,300)			
additional	41 (12,300)	74 (22,200)	115 (34,500)			
Sub-total	41 (12,300)	115 (34,500)	156 (46,800)	24.6	69.0	93.6
1,000 dwt for replacement	0	52 (52,000)	52 (52,000)			
additional	0	68 (68,000)	68 (68,000)			
Sub-total	0	120 (120,000)	120 (120,000)		276.0	276.0
3,000 dwt for replacement	5 (15,000)	0	5 (15,000)			
additional	14 (42,000)	23 (69,000)	37 (111,000)			
Sub-total	19 (57,000)	23 (69,000)	42 (126,000)	76.0	92.0	168.0
5,000 dwt for replacement	4 (20,000)	14 (70,000)	18 (90,000)			
additional	6 (30,000)	16 (80,000)	22 (110,000)			
Sub-total	10 (50,000)	30 (150,000)	40 (200,000)	28.0	84.0	112.0
10,000 dwt for replacement	2 (20,000)	2 (20,000)	4 (40,000)			
additional	0	2 (20,000)	2 (20,000)			
Sub-total	2 (20,000)	4 (40,000)	6 (60,000)	9.6	19.2	28.8
TOTAL	72 (191,300)	292 (413,500)	364 (552,800)	138.2	540.2	678.4

NOTE: (1) In addition tankers and other specialised vessels are required (see Table 19).

Table A7.16
PRICES OF VESSELS ACQUIRED IN VIETNAM (US\$ MILLION)

Vessel Type	Capacity of Vessel (dwt)					
	300	1,000	2,000	3,000	5,000	10,000
General Cargo/Bulk						
- new	0.6	2.3		4.0	10.0	17.0
- second-hand		1.0		1.5	2.8	4.8
Cement Carrier						
- new					12.0	14.0 ⁽¹⁾
- second-hand					3.4	4.0 ⁽¹⁾
Coal/Ore Carrier						
- new		3.0		5.0		
- second-hand		1.0		1.5		
Container Ship						
- new			7.0		14.0	
- second-hand			2.0		3.9	
Semi-Container Ship						
- new		5.0	7.0			
- second-hand		1.4	2.0			
Ro-Ro Ship						
- new					17.0	
- second-hand					4.8	
Crude Oil Tanker						
- new						40.0 ⁽²⁾
- second-hand						11.2
Refined Oil Tanker						
- new		4.0	6.4 ⁽³⁾	8.0		26.0 ⁽⁴⁾
- second-hand		1.1	1.8	2.2		7.3

SOURCE: JICA Study Team Estimates

NOTES:

(1) For 7,000 dwt

(2) For 80,000 dwt (based on VINALINES estimate)

(3) For 2,300 dwt

(4) For 20,000 dwt

(5) Prices for general cargo and bulk 1,000 and 3,000 dwt vessels based on estimated construction cost in Vietnam. Other prices estimated from planned purchases of VINALINES or from current Japanese prices, modified to allow for lower costs in south east Asian countries. Second hand values (always for foreign-built vessels) are assumed to be 28% of new values, based on the expected depreciated value after 12 years.

Table A7.17
POTENTIAL CARGO SHIP PURCHASES - ALTERNATIVE 1

Ship Type	Up to 2000			2001 - 2010		
	Newly Deployed Vessels	Price (US\$ mil)	Required Capital (US\$ mil)	Newly Deployed Vessels	Price (US\$ mil)	Required Capital (US\$ mil)
General						
Cargo/Bulk						
- 300 dwt	42	0.6	25.2	193	0.6	115.8
- 1,000 dwt	57	2.3	131.1	251	2.3	577.3
- 3,000 dwt	10	1.5	15.0	34	1.5	51.0
- 5,000 dwt	7	2.8	19.6	25	2.8	70.0
- 10,000 dwt	2	4.8	9.6	2	4.8	9.6
Cement Carrier						
- 5,000 dwt						
- 7,000 dwt						
Coal/ore Carrier						
- 1,000 dwt						
- 3,000 dwt						
Container Ship						
- 2,000 dwt (semi)						
- 5,000 dwt (full)						
Ro-Ro Ship						
- 5,000 dwt						
Oil Tanker						
(a) with Dung Quat						
- 2,300 dwt	2	1.8	3.6	4	1.8	7.2
- 20,000 dwt	3	7.3	21.9	6	7.3	43.8
- 80,000 dwt	1	11.2	11.2	2	11.2	22.4
(b) without						
- 1,000 dwt	2	4.0	8.0	2	4.0	8.0
- 3,000 dwt	2	2.2	4.4	2	2.2	4.4
TOTAL						
(a) with Dung Quat	124		237.2	517		897.1
(b) without	122		212.9	509		836.1

Table A7.18
POTENTIAL CARGO SHIP PURCHASES - ALTERNATIVE 2

Ship Type	Up to 2000			2001 - 2010		
	Newly Deployed Vessels	Price (US\$ mil)	Required Capital (US\$ mil)	Newly Deployed Vessels	Price (US\$ mil)	Required Capital (US\$ mil)
General						
Cargo/Bulk						
- 300 dwt	0	0.6	0.0	82	0.6	49.2
- 1,000 dwt	0	2.3	0.0	65	2.3	149.5
- 3,000 dwt	19	4.0	76.0	4	4.0	16.0
- 5,000 dwt	10	10.0	100.0	17	10.0	170.0
- 10,000 dwt	2	17.0	34.0	4	17.0	68.0
Cement Carrier						
- 5,000 dwt	4	12.0	48.0	14	12.0	168.0
- 7,000 dwt	0	14.0	0.0	2	14.0	28.0
Coal/ore Carrier						
- 1,000 dwt	3	3.0	9.0	20	3.0	60.0
- 3,000 dwt	2	5.0	10.0	15	5.0	75.0
Container Ship						
- 2,000 dwt (semi)	2	7.0	14.0	2	7.0	14.0
- 5,000 dwt (full)	0	14.0	0.0	2	14.0	28.0
Ro-Ro Ship						
- 5,000 dwt	0	17.0	0.0	2	17.0	34.0
Oil Tanker						
(a) with Dung Quat						
- 2,300 dwt	2	6.4	12.8	4	6.4	25.6
- 20,000 dwt	3	26.0	78.0	6	26.0	156.0
- 80,000 dwt	1	40.0	40.0	2	40.0	80.0
(b) without						
- 1,000 dwt	2	4.0	8.0	2	4.0	8.0
- 3,000 dwt	2	8.0	16.0	0	8.0	0.0
TOTAL						
(a) with Dung Quat	48		421.8	241		1,121.3
(b) without	46		315.0	231		867.7

Table A7.19
POTENTIAL CARGO SHIP PURCHASES - ALTERNATIVE 3

Ship Type	Up to 2000			2001 - 2010		
	Newly Deployed Vessels	Price (US\$ mil)	Required Capital (US\$ mil)	Newly Deployed Vessels	Price (US\$ mil)	Required Capital (US\$ mil)
General						
Cargo/Bulk						
- 300 dwt	41	0.6	24.6	115	0.6	69.0
- 1,000 dwt	0	2.3	0.0	120	2.3	276.0
- 3,000 dwt	19	4.0	76.0	23	4.0	92.0
- 5,000 dwt	10	2.8	28.0	30	2.8	84.0
- 10,000 dwt	2	4.8	9.6	4	4.8	19.2
Cement Carrier						
- 5,000 dwt	4	3.4	13.6	14	3.4	47.6
- 7,000 dwt	0		0.0	2	4.0	8.0
Coal/ore Carrier						
- 1,000 dwt	0					
- 3,000 dwt	0					
Container Ship						
- 2,000 dwt (semi)	2	7.0	14.0	2	7.0	14.0
- 5,000 dwt (full)	0					
Ro-Ro Ship						
- 5,000 dwt	0		0.0	2	4.8	9.6
Oil Tanker						
(a) with Dung Quat						
- 2,300 dwt	2	6.4	12.8	4	6.4	25.6
- 20,000 dwt	3	7.3	21.9	6	7.3	43.8
- 80,000 dwt	1	11.2	11.2	2	11.2	22.4
(b) without						
- 1,000 dwt	2	4.0	8.0	2	4.0	8.0
- 3,000 dwt	2	8.0	16.0	0	8.0	0.0
TOTAL						
(a) with Dung Quat	84		211.7	324		711.2
(b) without	82		189.8	314		627.4

APPENDIX 8

Example Curricula for Training Courses

This appendix describes outlines of training courses which would be suitable for management in coastal shipping.

They cover international experience in relevant aspects of coastal shipping and how these can be applied in the Vietnamese context.

Training Course on Liner Shipping

1. Objectives

By the end of training period, the participants are expected to understand the following items;

- 1) Comprehensive basic knowledge and techniques of the liner shipping business, including management of containers.
- 2) Coastal shipping policies of countries in the South East Asian region.
- 3) Current situation and future prospect of liner services in coastal shipping in the region.

2. Lecture Curriculum

A) Government Administration of Shipping

a) Administration of International shipping

- To explain the present situation of coastal shipping and measures taken to develop these businesses
- To compare policies towards coastal shipping in South East Asia, Europe, America and other regions.
- To explain contents of principal shipping-related laws and ordinances in South East Asia and other regions.
- To explain present conditions of Japanese coastal shipping companies (with liner departments) and measures taken to develop them.

b) Present situation and Future Plans for Coastal Shipping Terminals in Japan and other South East Asian countries.

- To give a brief history of the development of ports used by coastal shipping in South East Asia and the present conditions of ports.

c) Administrations of Seafarers

- to explain administrative organisations and policies for seafarers and the present conditions in which South East Asian seafarers are employed.

B) Maritime Law

a) Ocean Carrier's Liability

- to explain responsibilities of common carriers (legal aspects of transportation agreements and disputes settlement)

b) Charter Party and Maritime Arbitration

- to explain legal characteristics of charter parties and practical experience on arbitration of shipping disputes.

c) Cargo Claims

- to explain legal basis for claims related to non-arrival, theft, pilferage and damage of cargo, as well as claim procedures (by referring to judicial precedents)

C) Liner Shipping Business

a) Liner Shipping Business

- to explain the operational nature and organisations of liners and the basis for their profitability.

b) Containerisation in the Shipping Field

- to explain basic knowledge, present situation and history of containerisation in maritime shipping, and the evolution of containers in term of hardware, together with their future prospects.

c) Purchasing and Leasing of Containers

- to explain systems for holding containers (in light of financial aspects) in shipping companies.

d) Management and Operation of Liner Services

- to explain problems found in container-holding systems and management operation of containers, relevant to promoting containerisation.
- to explain management philosophy regarding liner transport of non-containerised cargo.

e) Terminal Operation

- to outline terminal facilities, loading and unloading systems, and basic activities in managing terminals.

f) International Combined Transport

- to explain present conditions, regulations and problems to be seen in the future of international combined transport (significance of new transportation systems promoted by containerisation and needs of shipping companies for overall material-handling services)

g) Activities of Japanese Shippers' Council

- to explain the organisation, activities, and functions (including co-operation among shippers to rationalise and make efficient maritime transportation, and relations with shipping conferences) of the Japanese Shippers' Council.

D) Other Aspects related to the Liner Shipping Business

a) Liner Shipping Service of the World

- to explain the present conditions of liner routes in the world (by emphasising routes and activities of container liners in the Pacific and Northeast American routes) as well as activities of Japanese liners and their particular problems.

b) Profitability Estimation in using Second-hand or New Vessels

- to explain types of newly built vessels, Japan's planned shipbuilding system and problems concerning long term profitability.
- to explain world-wide availability of second-hand vessels suitable for coastal shipping

c) Technological Innovation of Vessels

- to explain the present conditions and problems of modernised vessels which allow automation, and labour and energy savings.

d) Maritime Insurance

- to explain the basic knowledge (concepts, history, types, objects, loss ratios, etc.) of marine insurance based on the concepts of the Lloyd's Agreements.

Training Course on Specialised Ship Operation

1. Objectives

By the end of training period, the participants are expected to understand the following items;

- 1) Comprehensive basic knowledge and techniques of using specialised ships for oil and cement transport
- 2) How specialised ships are used in coastal shipping in countries in the South East Asian region
- 3) Future prospects for using specialised ships in coastal shipping in Viet Nam.

2. Lecture Curriculum

The following curriculum is suitable for overall management of specialised ships. Almost all aspects are also relevant to sales staff. Aspects relevant to technical and computer staff are listed later.

A) The Role of Specialised Ships

a) Advantages and Disadvantages of Specialised Ships

- operational aspects,
- economic and financial aspects

b) Potential Situations for using Specialised Ships

- traffic characteristics,
- economic circumstances

B) Examples of using Specialised Ships

a) Oil tankers

b) Cement Carriers

C) Requirements for using Specialised Ships

a) Ship Design

- framing system
- hull structure
- equipment

b) Port Facilities

- physical requirements
- equipment

D) Planning of Operations

a) Marketing

- nature of commodity
- traffic forecasting
- sales activities

b) Assessing Profitability

- freight mechanism
- cost analysis
- voyage account

E) Legal Aspects

a) Maritime Law

- domestic laws and regulations
- international conventions

b) Responsibilities of Owners/Operators

- contracts (voyage/time charter party)
- cargo claims settlement
- Arbitration

F) Operations Management

a) Ship Navigation

b) Loading and Discharging

G) Risk Management

a) Environmental Protection

b) Insurance

H) Finance

a) Capital Requirements

- Cost estimates
- Sources of Finance
- Terms of Finance

b) Accounting

I) Management Information

a) Information Needs

b) Computerisation

3. Aspects Relevant to Technical Staff

A) The Role of Specialised Ships

B) Examples of using Specialised Ships

C) Requirements for using Specialised Ships

D) Planning of Operations

F) Operations Management

I) Management Information

4. Aspects Relevant to Computer Staff

D) Planning of Operations

H) Finance

I) Management Information

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