India Crude Tanker Report

Indian crude tanker trade provides an interesting long-term business opportunity for both existing and prospective participants in the Indian Shipping Industry

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1.0 Introduction

The Indian Finance Minister introduced long-awaited tonnage tax regime on 8 July 2004, as part of Finance Bill (No. 2) 2004. Once Parliament and the President give assent to the Finance Bill, the regime will come into force with effect from 1 April 2004.

In recent years, there has been a decline in Indian maritime tonnage primarily because India's tax rules on shipping being out of sync with global practice. The tonnage tax, levied at a flat rate on the gross registered tonnage of ships owned by shipping companies, is aimed at promoting the Indian shipping industry by providing a level playing field.

Expectations prevail that the new tonnage tax system, which conforms to global practices, will encourage an influx of capital into this sector.

The global developments too have been favorable, with rising asset prices and freight rates, shipping companies are sitting pretty on strong cash flows. Most of the action has been driven by global developments on crude oil. It is imperative for Indian shipping companies to explore this opportunity both with medium as well as long-term strategy.

In this report, we attempt to cover all the important issues and developments that govern the crude tanker market and evaluate the business opportunity that exists for a prospective participant in the Indian Shipping Industry.

2.0 Global Economy

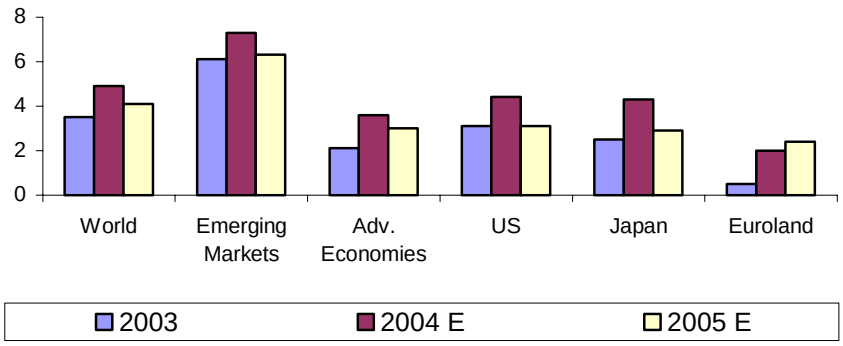
Following an impressive performance in the 1HCY04, the Global economy is entering a phase of moderate growth. Clearly there are mixed developments as regards growth.

Economic growth in US would be governed by fiscal and monetary measures, guided by a trade off between growth and inflation. The growth in the medium term is expected to get stabilised between 2.5-3.0%.

Euro land upswing (driven by strong external demand, low interest rates and neutral inflation), would be checked by tightening monetary policy for the first time. These developments would continue to display a 2.0%+ GDP growth for the region over the medium term.

Japanese economic indicators too are highlighting a broader recovery. Sustained demand for private capex & continued support from private consumption is expected to maintain a medium term GDP growth rate at 4%.

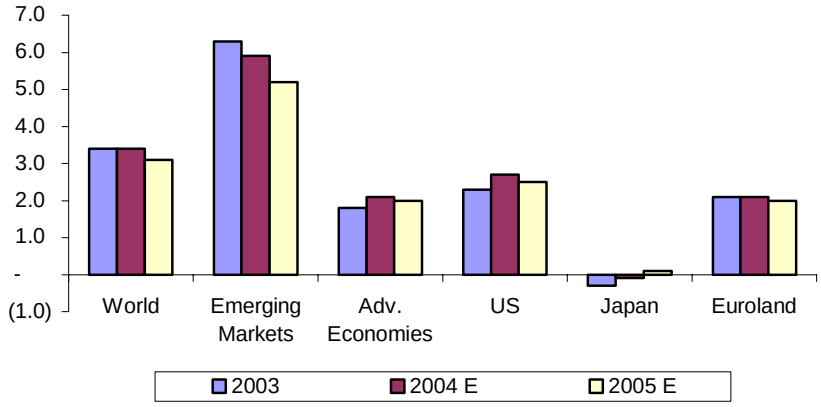
Figure 1: GDP Growth



The rest of Asia is currently suffering from mid-cycle turbulence resulting from the early ripples of oil-shock and the expected monetary tightening from the growth engines of China and India. Domestic demand recovery would remain critical for the resilience of these markets. The performance in medium term depends on the policymakers' ability to engineer a gradual adjustment to a lower sustainable growth rate.

There are some common elements in immediate future, that would be guiding the eventual performance of the global economy –

Figure 2: Inflation



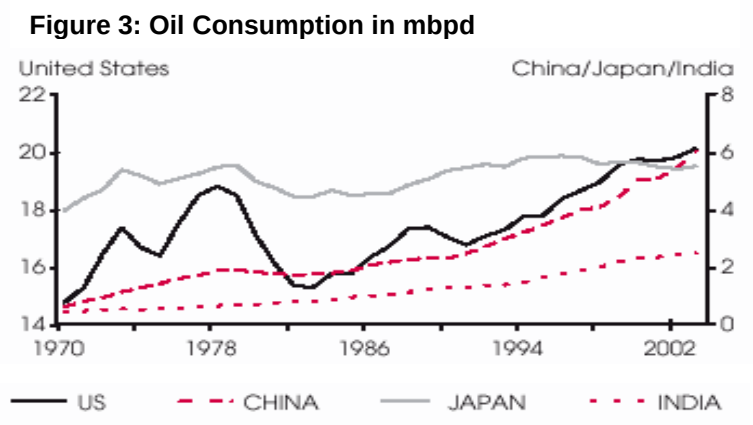
- Slower growth rates
- Rising inflation
- Higher interest rates.

This is a distinctly different scenario than the one witnessed in the last 12-months.

3.0 Oil Shock – and its relevance

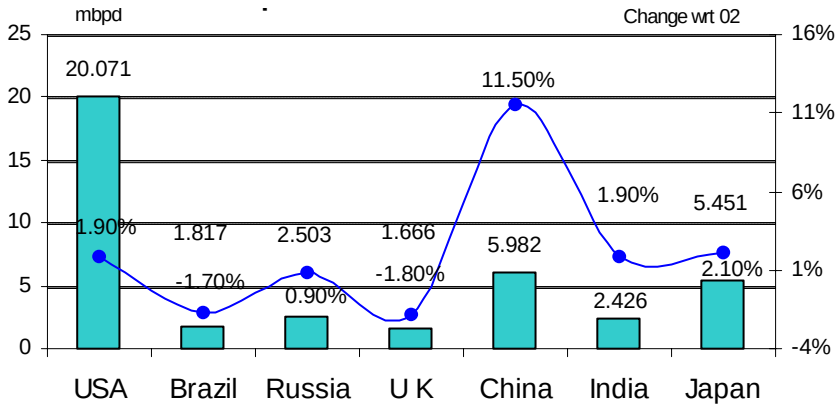
Oil price hikes have often preceded global recessions in the modern era. Recently, oil prices have been rising again. The price of a barrel of Brent crude bottomed out at $16.57 on November 15, 2001—as disruptions from the September 11, 2001, attacks reduced demand from air traffic and related economic activity—**before rising to $45.0 on August 24, 2004**. Will recent oil price increases bring the current growth to a premature end?

Figure 3: Oil Consumption in mbpd



James Hamilton, a noted researcher on the macroeconomics of oil shocks has quoted through his econometric model that 22 % sustained oil price increase would results in 1.1% slower economic growth. He further argues

Figure 4: Oil Consumption of Selected Economies in 2003



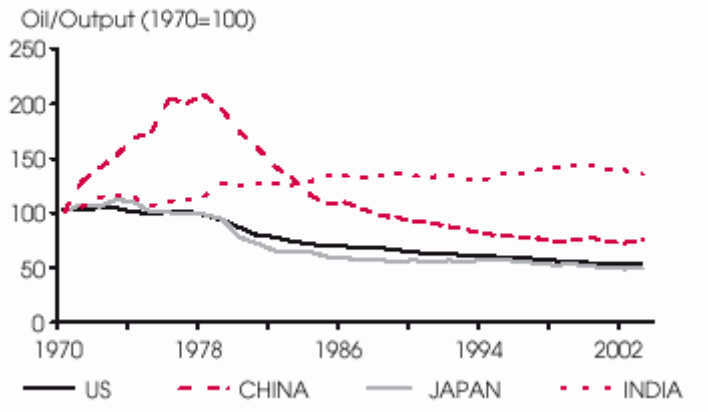
that several factors differentiate the current situation from those of past recessions. He points out that the source and size of the recent oil price surge might mean there is less risk for the economy than one might think.

In 1970s price increase resulted out of restriction of supply has caused the oil shock. In the present situation, rapidly growing demand from the world economy has bid up the price of oil. Figure 3 shows the oil consumption of four largest oil-consuming nations.

U.S. and Chinese consumption has been expanding rapidly, as these two nations have enjoyed vigorous growth recently. (see Fig. 4) A second difference is that part of the recent uptick in oil prices merely retraces earlier price declines. Comparing current prices to the lows of the fall and winter of 2001 is misleading; prices of Brent crude were above $30 in 2000 and in January 2003. An increase from $30 to $36 is very modest compared with the doubling or tripling of prices seen in 1974 and 1979. Further, real oil prices were much higher in 1979 than they are today, about $80 a barrel in 2004 dollars.

Oil is also relatively less important to the U.S. economy than it was in the past. Figure 5 illustrates that oil consumption per unit of real GDP has fallen about 50 percent in the United States and Japan since 1970. A shift of U.S. and Japanese output to high-tech manufacturing, as well as vehicles and development of more fuel efficient machinery are the probable dominant contributors to this drop.

Figure 5: Oil Consumption per unit of Output



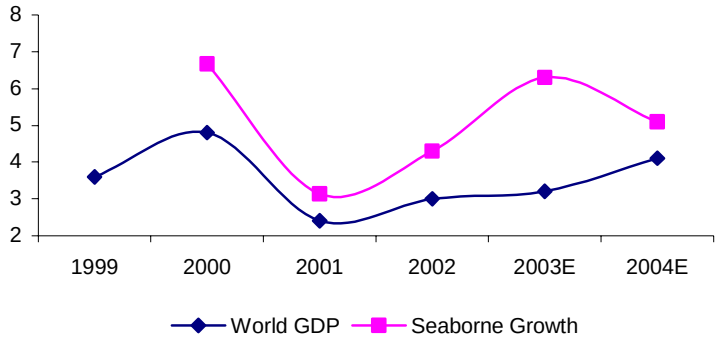
Chinese output data are probably less reliable over long periods but there appears to have been a large drop in oil consumption per unit of output since the 1970s. In contrast, oil has become more important to Indian output as its formerly agrarian economy has industrialised.

4.0 Global Seaborne Trade

Global Sea borne trade is a function of

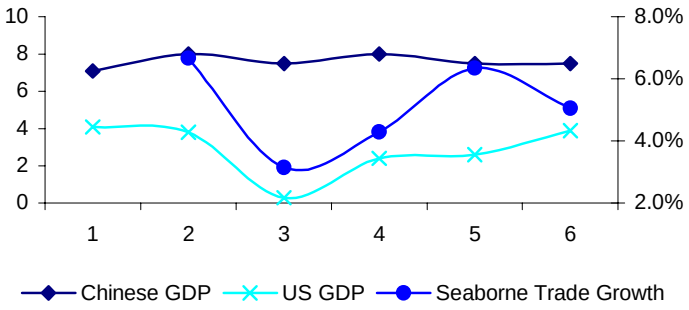
- GDP growth
- Domestic consumption
- Resource Availability

Figure 6: World GDP and Seaborne Trade



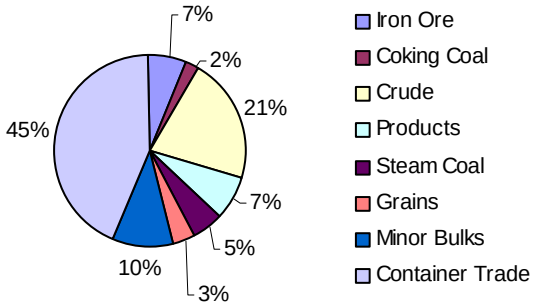
Sea borne trade in absolute form has increased from 6.5 trillion tons in 1999 to 7.9 trillion tons in 2003 at a CAGR of 5.1%. According to IMF Approximately 2.9% increase in world GDP increases sea borne trade by around 4.3 %

Figure 7: Selected GDP & Seaborne Trade



China has driven the global trade and has merely changed the demand supply equation since January 2003. US economy is also reviving. It has registered 2.3 % GDP growth in 2003 and is expected to grow even further. Sheer economic size and its trade makes US a very significant constituent of world sea borne trade, however the emerging growth engines of China and India would be key determinants of the growth rates in the future.

Figure 8: Commodity wise Seaborne Trade



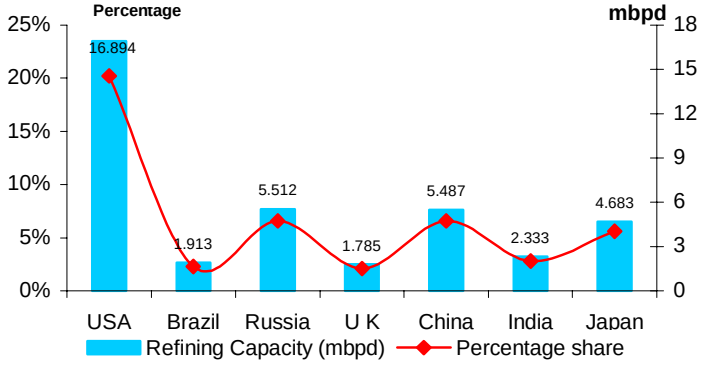
5.0 Crude Tankers

Currently, at 21% of the total cargo crude oil is the largest single commodity in international trade. This makes Crude tankers an important segment. IEA studies highlight that even after a decade, crude would remain a dominant segment for energy generation at 34% of total requirements. Further the concentration of production and consumption clusters in different geographies makes crude tanker trade a more sustainable business opportunity.

5.1 Global Crude Trade Patterns and Demand Analysis

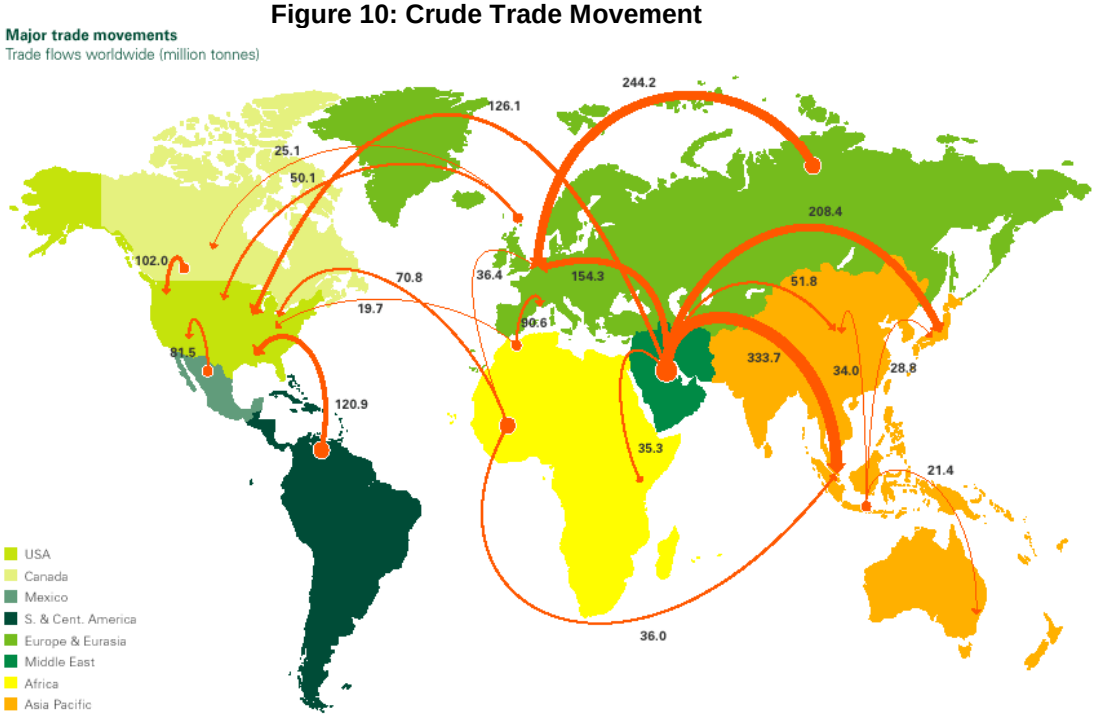
US, with around 21 % of total world refining capacity, is growing rapidly since last two – three quarters. China, with 6.6% refining capacity almost equal to Russian refining capacity, is thriving on its growth since last two years. Brazil and India are also maintaining their growth spree, which are having fifth and sixth largest refining capacities.

Figure 9: Refining Capacities



Typically oil trade follows a pattern and this trade flow is picturised in Fig. 10. Economies with high refining capacities and with considerably low oil reserve and domestic oil production are pushing the demand for oil in upward direction. Looking at the rising demand from these economies and demographic characteristics seaborne trade for oil is expected to boost further.

Figure 10: Crude Trade Movement



Source: British Petroleum

Soaring Oil Prices as a result of this and over dependence of economies like China and India on Oil producing economies has forced these nations to invest aggressively into oil equities in non-conventional oil producing territories such as Sudan, Equador, Angola, Cuba and Libya.

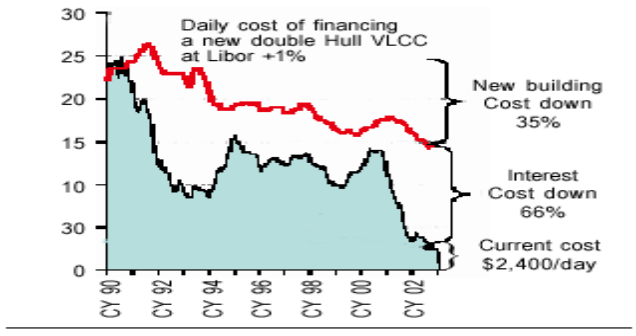
For India alone this means assured trade flow of approximately 12 mn ton of oil annually by 2007-08.

5.2 Supply Analysis – Current/Expected Fleet

(mn Dwt)

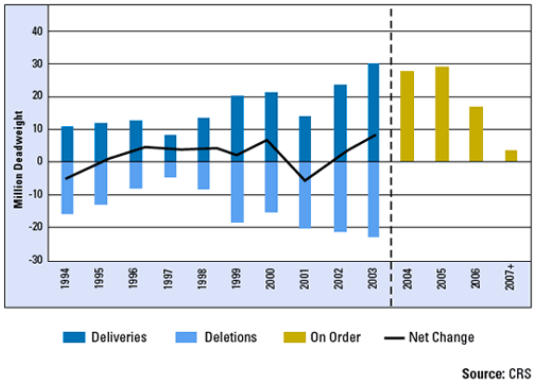
	Age Profile ofTanker Fleet										Total		Orderbook					
	20 +		15-19		10-14		5-9		0-4				2004		2005		2006	
	No	DWT	No	DWT	No	DWT	No	DWT	No	DWT	No	DWT	No	DWT	No	DWT	No	DWT
Handysize	380	7.5	146	3	102	2.1	157	2.4	176	3.1	961	18.1	39	0.7	47	0.8	68	1.1
Handymax	309	12.2	130	5.4	118	4.8	207	8.5	337	13.9	1101	44.8	76	3.2	136	5.9	156	6.8
Panamax	73	4.7	40	2.7	35	2.4	11	0.8	80	5.7	239	16.3	16	1.2	44	3.1	58	4.2
Aframax	81	7.3	88	8.1	133	12.9	115	11.7	200	21.2	617	61.2	22	2.4	62	6.7	76	8.2
Suezmax	31	4.4	23	3.2	77	11.4	63	9.2	109	16.9	303	45.1	10	1.6	26	4.1	45	7.2
VLCC	23	6.5	34	8.7	120	33.3	96	28.2	166	50.7	439	127.4	17	5.2	33	10.1	39	11.9

Figure 11: VLCC Ownership Cost



Source: Clarkson

Figure 12: Tanker Fleet-Net Changes



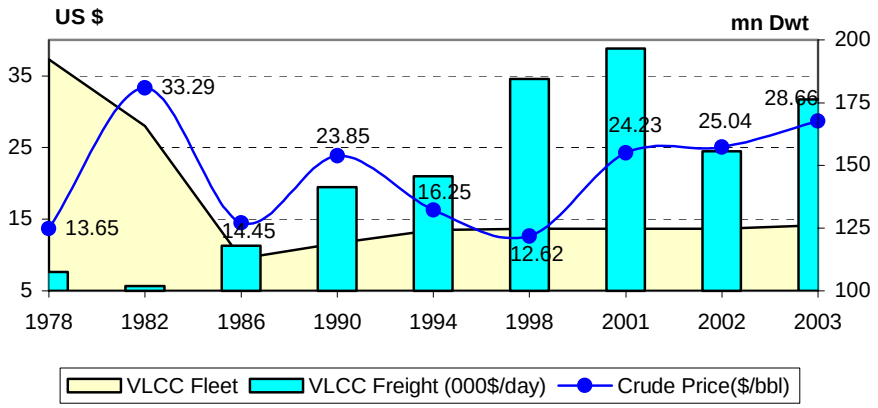
Source: CRS

Post Prestige/ Erika incidence IMO has forced the compulsory demolition of vessels and higher steel prices has forced some voluntary scrapping of vessels in the recent past. As per order book, as on August 14, 2004, Tanker fleet is expected to touch 354 mn DWT net of scrapping from current levels of 314 mn Dwt (3-year CAGR 4.03%). VLCC segment is expected to grow reach 148 mn DWT from its current levels of 127 mn (3-year CAGR 5.17%). Thus, VLCC will be the fastest growing (and largest) crude oil tanker segment.

Figure 11 explains in brief the cost economics of owning a VLCC. Thus as the VLCC freight rates have been on the rise, the falling ownership costs have made it an attractive segment to enter. This should over a medium term (24-30 months) results in an increased supplies for the segment.

5.3 VLCC Rates & outlook

Figure 13: Crude Tanker Freight Analysis



Shipping freight rates historically have been dependent on oil prices and available tonnage on order. Simultaneously, the expected net additions also play a very critical role. The current increase in the tanker freight rates is flared by high demand for crude oil (with larger composition of long haul routes) and relatively slower additions to the existing fleet.

Going forward, the slower fleet addition against the required demand would continue to keep the VLCC rates firm for at least 12—15 months.

6.0 Indian Crude Tanker Scenario

6.1 Crude Demand Supply

Crude Oil is among the critical input resource towards development of any economy. Very few countries have been blessed with self-sufficiency on this front. Most of the economies have to significantly rely on crude imports. India is no exception.

The crude consumption in any economy is a function of the industrial and consumer growth that it witnesses. Typically in a developing economy crude demand tracks the GDP growth almost to the neckline.

Refineries – the main users of crude oil have witnessed a demand growth of almost 6% Rising POL demand, increasing refining capacities on ground coupled with slow growth in domestic explorations would continue to drive crude imports to India.

The crude consumption is expected to grow at 4.6% CAGR. The assumption driving these growth estimates is summarized in the table below.

Table 2: Indian Refining Capacities

Name of the Company	Location of the Refinery	Connected Port	Capacity (MMTPA)*			
			1999	2003	2007	2010
1.Indian Oil Corporation Ltd. (IOC)	Guwahati	Haldia	1.0	1.0	1.0	1.0
	Barauni	Haldia	4.2	6.0	6.0	6.0
	Koyali	Kandla	12.5	13.7	13.7	13.7
	Haldia	Haldia	3.8	4.6	4.6	4.6
	Mathura	Kandla	7.5	8.0	8.0	8.0
	Digboi	Haldia	0.1	0.7	0.7	0.7
	Panipat	Kandla	6.0	6.0	12.0	12.0
2.Hindustan Petroleum Corpn.Ltd. (HPCL)	Mumbai	Mumbai	5.5	5.5	6.0	6.0
	Visakhapatnam	Visakhapatnam	4.5	7.5	8.5	10.0
	Bhatinda	Kandla				6.0
3.Bharat Petroleum Corpn. Ltd. (BPCL)	Mumbai	Mumbai	6.9	6.9	6.9	6.9
4.Chennai Petroleum Ltd. (CPL)	Chennai	Chennai	6.5	6.5	10.0	10.0
5.Crude Distillation Unit of CPL	Narimanam	Chennai	0.5	1.0	1.0	1.0
6.Cochin Refineries Ltd. (CRL)	Cochin	Cochin	7.5	7.5	9.0	9.0
7.Bongaigaon Refinery and Petrochemicals Ltd. (BRPL)	Bongaigaon	Haldia	2.4	2.4	2.4	2.4
8.Numaligarh Refineries Ltd. (NRL)	Numaligarh	Haldia	3.0	3.0	3.0	3.0
9.Mangalore Refinery and Petrochemicals Ltd. (MRPL)	Mangalore	Mangalore	9.7	9.7	9.7	12.0
10.ONGC Tatipaka	Tatipaka	--	0.0	0.1	0.1	0.1
11.Reliance Petroleum Ltd. (RPL)	Jamnagar	Jamnagar	27.0	27.0	35.0	42.0
12. Essar Refinery	Jamnagar	Vadinar				10.5
Total			**109.0**	**117.0**	**136.9**	**164.9**
Total refining Throughput*			**68.5**	**112.6**	**126.0**	**156.0**

* Assuming 92 % crude throughput for the year s 2007 & 2010

Crude throughput of individual refinery in future is assumed from its last five years capacity utilization level and increased installed refining capacity is assumed from the public announcement of refinery relating to their expansion plans and green field venturing. Time span, by which actually these expansions programme will be completed, is considered on conservative side.

Looking at the exploration policies and developments, we feel that domestic production, which is hovering at around 33 mn tons per year since last 3-4 years, will go up by 2010 on account of Cairns finding and aggressive explorations by Oil and Natural Gas Corporation (ONGC). These calculations factor-in the expected exploration under the NELP blocks recently awarded by MoP.

The expected domestic crude supply is as follows –

Table 3: Domestic Oil Production

mn TPA

	1999	2003	2007	2010
Oil and Natural Gas Corporation (ONGC)	26.4	26.0	27.0	29.0
Oil India Limited (OIL)	3.3	2.9	3.0	3.0
Private & others	3.0	4.1	4.5	7.0
TOTAL	**32.7**	**33.0**	**34.5**	**41.0**

Sources – company announcements, Ministry of petroleum, i-maritime estimates

The expected demand supply gap for crude oil is estimated to be –

Table 4: Oil Supply Gap

mn TPA

	1999	2003	2007	2010
TOTAL Domestic Production	32.7	33.0	34.5	41.0
Expected Crude Demand	68.5	112.6	126.0	156.0
Expected Supply Gap = Imports	**35.8**	**79.6**	**91.5**	**115.0**

6.2 Crude tankers handled in 2003- 04

From the primary data collected from different ports we have calculated the frequency call of a specific ship category carrying crude at each port. A close look at the locational significance of these ports to various refineries, their proposed expansions/ upgrades and other developments provides an insight to the prospective calls of various ship categories to these respective ports.

Table 5 shows the frequency of ships carrying crude oil at these ports in various ship categories (such as Handymax, Panamax, Aframax and VLCC's). Detailed analyses of the data (a sample of Month March 04 for all the ports is attached in Annexure A-5) reveals about 75-80% of the Suezmax are carrying the Aframax parcel sizes. Similarly, almost 80 % of the coastal Aframax vessels are carrying Panamax parcels.

Table 5: Frequency of vessels called on Indian Coast

Port	Vessel Category	Total	Overseas	Coastal
Vizag*	Handymax	30	0	30
	Panamax	39	6	33
	Aframax	63	53	10
	Suezmax	49	43	6
	VLCC		0	0
Chennai	Handymax	17	2	15
	Panamax	26	12	14
	Aframax	22	14	8
	Suezmax	15	12	3
	VLCC	0	0	0
Cochin	Handymax	14		14
	Panamax	37	11	26
	Aframax	82	73	9
	Suezmax			
	VLCC			
New Mangalore	Handymax	5	0	5
	Panamax	15	0	15
	Aframax	97	79	18
	Suezmax	11	10	2
	VLCC			
Mumbai	Handymax	35	9	26
	Panamax	107	24	83
	Aframax	68	41	27
	Suezmax	48	48	
	VLCC			
Kandla (incl. Vadinar)*	Handymax			
	Panamax	50	5	45
	Aframax	29	19	10
	Suezmax	45	45	
	VLCC	38	38	
Sikka*	Suezmax	21	21	
	VLCC	94	94	

6.3 Crude Tanker Demand

Table 6: Category wise vessel demand in 2003 - 2004

Port	Vessel Category	Total no of Ships	No of Ships on Overseas trade	No of Ships on Coastal trade	App. Voyage time of Overseas Vessel (Days)	App. Voyage time of Coastal Vessel (Days)	Total Voyage Time (Days)	Sailing time of one vessel (Days)	No of Vessels required in a year
Vizag*	Handymax	30	0	30		13	390	340	2
	Panamax	39	6	33	35	15	705	340	3
	Aframax	63	53	10	39	17	2237	340	7
	Suezmax	49	43	6	41	19	1877	340	6
	VLCC		0	0					
Chennai	Handymax	17	2	15	21	11	207	340	1
	Panamax	26	12	14	23	13	458	340	2
	Aframax	22	14	8	25	15	470	340	2
	Suezmax	15	12	3	31	17	423	340	2
	VLCC	0	0	0					
Cochin	Handymax	14		14		9	126	340	1
	Panamax	37	11	26	21	11	517	340	2
	Aframax	82	73	9	23	13	1796	340	6
	Suezmax							340	0
	VLCC							340	
New Mangalore	Handymax	5	0	5	21	7	35	340	1
	Panamax	15	0	15	23	9	135	340	1
	Aframax	97	79	18	25	11	2173	340	7
	Suezmax	11	10	2	27	13	296	340	1
	VLCC								
Mumbai	Handymax	35	9	26	15	0	135	340	1
	Panamax	107	24	83	17	0	408	340	2
	Aframax	68	41	27	19	0	779	340	3
	Suezmax	48	48		26	0	1248	340	4
	VLCC								
Kandla (incl. Vadinar)*	Handymax								
	Panamax	50	5	45	15	9	480	340	2
	Aframax	29	19	10	17	11	433	340	2
	Suezmax	45	45		19		855	340	3
	VLCC	38	38		39		1482	340	5
Sikka*	Suezmax	21	21		53		1113	340	4
	VLCC	94	94		53		4982	340	15

* Indicates figures are estimated based on the assumptions and with the help of various data sources like IPA and respective Port Statistics

We have extended the analyses of the crude cargo to be handled at these ports, the respective linkages of these refineries to various ports and the vessel traffic pattern (frequency). This enables us to forecast the expected demand pattern for the crude tanker carriers till 2010.

Our calculation for computing the required fleet is based on required sailing time between the cargo origin and destination, estimated time at each port for loading/unloading, and inefficiencies at each vessel and port side.

Table 7: Category wise vessel demand in 2006 - 2007

Port	Vessel Category	Total no of Ships	No of Ships on Overseas trade	No of Ships on Coastal trade	App. Voyage time of Overseas Vessel (Days)	App. Voyage time of Coastal Vessel (Days)	Total Voyage Time (Days)	Sailing time of one vessel (Days)	No of Vessels required in a year
Vizag	Handymax	30	0	30		13	390	340	2
	Panamax	39	6	33	35	15	705	340	3
	Aframax	67	57	10	39	17	2393	340	8
	Suezmax	59	53	6	41	19	2287	340	7
	VLCC	0	0	0					
Chennai	Handymax	17	2	15	21	11	207	340	1
	Panamax	26	12	14	23	13	458	340	2
	Aframax	37	29	8	25	15	845	340	3
	Suezmax	34	31	3	31	17	1012	340	3
	VLCC	0	0	0					
Cochin	Handymax	14		14		9	126	340	1
	Panamax	26		26	21	11	286	340	1
	Aframax	10		10	23	13	130	340	1
	Suezmax	21	21		25		525	340	2
	VLCC	15	15		27		405	340	2
New Mangalore	Handymax	5	0	5	21	7	35	340	1
	Panamax	15	0	15	23	9	135	340	1
	Aframax	97	79	18	25	11	2173	340	7
	Suezmax	11	10	2	27	13	296	340	1
	VLCC								
Mumbai	Handymax	48	9	39	15	0	135	340	1
	Panamax	114	21	93	17	0	357	340	2
	Aframax	85	36	49	19	0	684	340	3
	Suezmax	43	43		26	0	1118	340	4
	VLCC	0							
Kandla (incl. Vadinar)	Handymax	0							
	Panamax	55	8	47	15	9	543	340	2
	Aframax	37	26	11	17	11	563	340	2
	Suezmax	49	49		19		931	340	3
	VLCC	57	57		39		2223	340	7
Sikka	Suezmax	27	27		53		1431	340	5
	VLCC	113	113		53		5989	340	18

Table 8: Category wise vessel demand in 2009 - 2010

Port	Vessel Category	Total no of Ships	No of Ships on Overseas trade	No of Ships on Coastal trade	App. Voyage time of Overseas Vessel (Days)	App. Voyage time of Coastal Vessel (Days)	Total Voyage Time (Days)	Sailing time of one vessel (Days)	No of Vessels required in a year
Vizag	Handymax	30	0	30		13	390	340	2
	Panamax	39	6	33	35	15	705	340	3
	Aframax	67	57	10	39	17	2393	340	8
	Suezmax	59	53	6	41	19	2287	340	7
	VLCC	0	0	0					
Chennai	Handymax	17	2	15	21	11	207	340	1
	Panamax	26	12	14	23	13	458	340	2
	Aframax	37	29	8	25	15	845	340	3
	Suezmax	34	31	3	31	17	1012	340	3
	VLCC	0	0	0					
Cochin	Handymax	14		14		9	126	340	1
	Panamax	26		26	21	11	286	340	1
	Aframax	10		10	23	13	130	340	1
	Suezmax	21	21		25		525	340	2
	VLCC	15	15		29		435	340	2
New Mangalore	Handymax	5	0	5	21	7	35	340	1
	Panamax	15	0	15	23	9	135	340	1
	Aframax	105	79	18	25	11	2173	340	7
	Suezmax	13	10	2	27	13	296	340	1
	VLCC	5	5	0	31		155	340	1
Mumbai	Handymax	48	9	39	15	0	135	340	1
	Panamax	117	24	93	17	0	408	340	2
	Aframax	88	41	47	19	0	779	340	3
	Suezmax	48	48		26	0	1248	340	4
	VLCC	0							
Kandla (incl. Vadinar)	Handymax	0							
	Panamax	55	8	47	15	9	543	340	2
	Aframax	37	26	11	17	11	563	340	2
	Suezmax	55	55		19		1045	340	4
	VLCC	73	73		39		2847	340	9
Sikka	Suezmax	37	37		53		1961	340	6
	VLCC	125	125		53		6625	340	20

Based on these facts, the analysis highlights gives following results as regards demand patterns across various ship categories. These demand computations exclude the Sikka requirements (as RIL cargo follows a distinct route – From Gulf to EU, EU to Nigeria and from Nigeria to Sikka).

Table 9: Category wise vessel demand Matrix (exclu. Sikka)

Ship category	2003 - 04	2006 - 07	2009 - 10
Handymax	6	6	6
Panamax	12	11	11
Aframax	27	24	24
Suezmax	16	20	21
VLCC	5	9	12
Total	**66**	**70**	**74**

We have reworked these numbers for cargo including the Sikka port. The revised demand pattern (including Sikka) is –

Table 10: Category wise vessel demand Matrix (inclu. Sikka)

Ship category	2003 - 04	2006 - 07	2009 - 10
Handymax	6	6	6
Panamax	12	11	11
Aframax	27	24	24
Suezmax	20	25	27
VLCC	20	27	32
Total	**85**	**93**	**100**

6.4 Supply Analysis for Crude oil tankers

For Supply of crude oil tankers, Indian tonnage has been analysed to find out no. of available vessels. Following are the main assumption while calculating the supply changes –

- All the publicly announced plans are factored in.
- Managements with aggression and financial prudence (GESCO, SCI (considering some implementation delays for capex commitments) and Mercator) have been credited with additional fleet expansions
- The DG shipping directive of compulsory scrapping of aged oil tankers has also been duly factored in.

The supply numbers must be viewed with following caveats –

- Out of 11 Oil tankers owned by GESCO 50 % of tonnage is operating on Global trade
- Essar too follows a practice of deploying all its 6 Suezmax on Global trade.

Table 11: Expected Indian Tanker Fleet-Category wise

	2003 - 04	2006 - 07	2009 - 10
Handymax	2	2	2
Panamax	15	15	7
Aframax	25	21	18
Suezmax	13	13	17
VLCC		4	8
Total	55	55	52

6.5 Demand Supply Gap

As the following table suggests, there exists substantial demand supply gap across each category of crude tanker segment

Table 12: Expected Indian Tanker Demand Supply Gap (inclu. Sikka)

	2003 - 04	2006 - 07	2009 - 10
Handymax	4	4	4
Panamax	-3	-4	4
Aframax	2	3	6
Suezmax	7	12	10
VLCC	20	23	24
Total	30	38	48

7.0 Conclusions

In the current environment the uncertainty on crude supplies would continue its overhang on the crude price scenario. In this environment, where global demand growth remains firm, the current buoyancy in the crude tanker trade will sustain its current firmness in short-term.

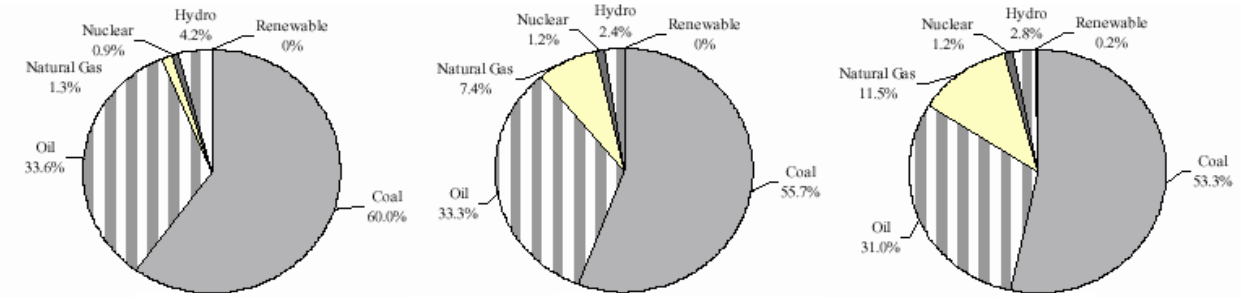
In the medium term, the attractiveness of owning a VLCC (with improved realizations and lower ownership costs) will continue to force further investment into new fleet – an eventuality by 2006-07. This can over a medium term (24-30 months) influence softness on the crude tanker freight rates.

Indian crude tanker trade would continue to predictably robust in view of India's improved significance in global demand composition, sustained dependence on crude imports, increased thrust on investing in OIL equity abroad, sizeable compliance driven depletion of Indian fleet, favourable cabotage laws and support given to the shipping industry by Government.

The opportunity for an existent as well an a prospective participant in this category remains attractive considering that as the estimates suggests **significant demand supply gap** (**Refer Table 12**) for Indian flag vessels in the overall crude trade, in almost each category.

Annexure

A-1 : Indian Energy Consumption Pattern



1999 **2010** **2020**

A-2 : Indian Energy Consumption Pattern

TABLE1 TREND AND OUTLOOK OF ECONOMY/ENERGY SUPPLY/DEMAND-IN INDIA (1)

%/Year

	UNIT	1980	1990	1999	2010	2020	1999/1980	2020/1999
PRIMARY ENERGY SUPPLY	MTOE	93.9	183.3	282.4	515.1	818.4	6	5.2
COAL	MTOE	56.3	106.5	157.2	284.2	469.3	5.6	5.3
OIL	MTOE	31.5	58.7	93.9	161	244.7	5.9	4.7
NATURAL GAS	MTOE	1.2	10.1	20.8	48.5	70.7	16.2	6
NUCLEAR	MTOE	0.8	1.6	3.4	5.9	9.9	7.9	5.2
HYDRO	MTOE	4	6.2	7	15	23.3	3	5.9
RENEWABLE	MTOE		0.1	0.1	0.6	0.6		
FINAL ENERGY CONSUMPTION	MTOE	59.3	113.1	162.9	324.6	504.3	5.5	5.5
INDUSTRY	MTOE	28	62	97.9	175.2	270.2	6.8	5
TRANSPORT	MTOE	18.4	26.4	44.5	76.3	118.9	4.8	4.8
OTHERS	MTOE	12.9	24.7	20.5	73.1	115.2	2.5	8.6
NET ENERGY IMPORT	MTOE	20.1	29.5	70	201.6	362.9	6.8	8.2
COAL	MTOE	-1.8	3.1	10.8	53.5	111.1	14.9(90~99)	11.7
OIL	MTOE	21.9	26.3	59.2	124	209.8	5.4	6.2
NATURAL GAS	MTOE	0	0	0	23.6	41.5		
OTHERS	MTOE	0	0.1	0.1	0.5	0.5		
POWER GENERATION TOTAL	TWh	119.3	289.4	527.3	938.8	1,584.3	8.1	5.4
COAL THERMAL	TWh	65.6	195.7	396.7	685.3	1109	9.9	5
OIL THERMAL	TWh	5.8	6.6	5.8	9.4	15.8	0	4.9
GAS THERMAL	TWh	1	9.3	29.2	47.4	151.1	19.4	8.1
THERMAL TOTAL	TWh	69.7	211.6	357.5	742.1	1275.9	9	6.2
NUCLAR	TWh	3	6.1	8.4	22.5	38	5.6	6.7
HYDRO	TWh	46.6	71.7	69.1	174.1	270.4	2.1	6.7
RENEWABLE	TWh	0	0	0.1	0.1	0.1		
CO_2 EMISSIONS	MT-C	88.1	171.4	276.5	473.3	757.7	6.2	4.9
GDP 1995 PRICE	$US Billion	158.7	275.1	449.1	732.6	1,137.7	5.6	4.5
POPULATION	MILLION	687.3	849.5	997.5	1,182.7	1,319.4	2	1.4
PRIMARY ENERGY/CAPITA	TOE/CAPITA	0.14	0.22	0.28	0.44	0.62	3.7	3.9
GDP ELASTIRITY							1.1	1.16

(NOTE) Actual:IEA Forecast:IEEJ

TABLE2 TREND AND OUTLOOK OF ECONOMY/ENERGY SUPPLY/DEMAND-IN INDIA (2)

	UNIT	1980	MIX %	1990	MIX %	1999	MIX %	2010	MIX %	2020	MIX %
PRIMARY ENERGY SUPPLY	MTOE	93.9	100	183.3	100	282.4	100	515.1	100	818.4	100
COAL	MTOE	56.3	60.0	106.5	58.1	157.2	55.7	284.2	55.2	436.2	53.3
OIL	MTOE	31.5	33.6	58.7	32	93.9	33.3	161	31.3	253.7	31
NATURAL GAS	MTOE	1.2	1.3	10.1	5.5	20.8	7.4	48.5	9.4	94.1	11.5
NUCLEAR	MTOE	0.8	0.9	1.6	0.9	3.4	1.2	5.9	1.1	9.9	1.2
HYDRO	MTOE	4	4.20	6.2	3.5	7	2.4	15	2.9	23.3	2.8
RENEWABLE	MTOE	1.1		0.2		0.1		0.6	0.1	0.6	0.2
FINAL ENERGY CONSUMPTION	MTOE	59.3	100	113.1	100	162.9	100	324.6	100	504.3	100
INDUSTRY	MTOE	28	47.2	62	54.8	97.9	60	175.2	54	270.2	53.6
TRANSPORT	MTOE	18.4	31	26.4	23.3	44.5	27.3	76.3	23.5	118.9	23.6
OTHERS	MTOE	12.9	21.8	24.7	21.9	20.5	12.7	73.1	22.5	115.2	22.8
NET ENERGY IMPORT	MTOE	20.1	100	29.5	100	73	100	201.6	100	362.9	100
COAL	MTOE	-1.8	-9	3.1	10.5	10.8	14.8	53.5	26.5	111.1	30.6
OIL	MTOE	21.9	109	26.4	89.5	59.2	81.1	124	61.5	209.8	57.8
NATURAL GAS	MTOE	0	0	0	0	0	0	23.6	11.7	41.5	37.4
OTHERS	MTOE	0	0	0.1	0	0.1	0	0.5	0.3	0.5	0.2
OUTSIDE INTERDEPENDENCE RATIO	%	21.4		26.1		25.8		39.1		44.3	
POWER GENERATION TOTAL	TWh	119.3	100	289.4	100	527.3	100	938.8	100	1,584.3	100
COAL THERMAL	TWh	65.6	55	195.7	67.6	396.7	75.3	685.3	73	1109	70
OIL THERMAL	TWh	3.1	2.6	6.6	2.3	5.8	1.1	9.4	1	15.8	1
GAS THERMAL	TWh	1	0.8	9.3	3.2	29.2	5.6	47.4	5	151.1	9.5
THERMAL TOTAL	TWh	69.7	0	211.6	73.1	431.7		742.1	79	1,275.9	
NUCLAR	TWh	3	2.5	6.1	2.1	8.4	1.6	22.5	2.4	38	2.4
HYDRO	TWh	46.6	39.1	71.7	24.8	87.1	16.4	174.1	18.6	270.4	17.1
RENEWABLE	TWh	0	0	0	0	0.1		0.1		0.1	
CO_2 EMISSIONS	MT-C	88.1		171.4		276.5		473.3		757.7	
GDP 1995 PRICE	$US Billion			275.1		449.1		732.6		1,137.7	
POPULATION	MILLION	687.3		849.5		997.5		1,182.7		1,319.4	
PRIMARY ENERGY/CAPITA	TOE/CAPITA	0.14		0.22		0.28		0.44		0.62	

(NOTE) Actual:IEA Forecast:IEEJ

Given the fact that Economy growing at modest growth of 6 % over the next 20 years, as suggested by figures above crude will continue to be a critical input in country's growth.

A-3: Indian Tankers - Coastal Fleet

S.No.	Name of Ship	Shipping Company	Category	Year of Built	Age	GRT	Dwt
1	M.T. C.V. RAMAN	SCI	TANKER (CRUDE OIL CARRIERS	1981	22	25040	41123
2	M.T. HOMI BHABHA	SCI	TANKER (CRUDE OIL CARRIERS	1982	21	25040	41123

A-4: Indian Tankers – Overseas Fleet

S.No.	Name of Ship	Shipping Company	Category	Year of Built	Age	GRT	Dwt
1	M.T. SHRAVAN	ESSAR SHIPPING	OIL TANKERS (CRUDE	1991	12	79718	154970
2	M.T. ISWARI	ESSAR SHIPPING	OIL TANKERS (CRUDE	1991	12	79718	154970
3	M.T. KAMLESH	ESSAR SHIPPING	OIL TANKERS (CRUDE	1991	12	79718	154970
4	M.T. KISHORE	ESSAR SHIPPING	OIL TANKERS (CRUDE	1992	11	79718	154970
5	M. T. CHANDA	ESSAR SHIPPING	OIL TANKERS (CRUDE	1992	11	80569	149600
6	M. T. NANDA	ESSAR SHIPPING	OIL TANKERS (CRUDE	1992	11	80569	149600
7	M.T. JAG LAADKI	GREAT EASTERN	OIL TANKERS (CRUDE	1992	11	78710	145242
8	M.T. JAG LEELA	GREAT EASTERN	OIL TANKERS (CRUDE	1999	4	58374	105148
9	M.T.Jag Lata	GREAT EASTERN	OIL TANKERS (CRUDE	2003	1	57508	105716
10	M.T.JagAnjali	GREAT EASTERN	OIL TANKERS (CRUDE	1986	18	36512	66203
11	M.T.Jag Leher	GREAT EASTERN	OIL TANKERS (CRUDE	1986	18	58853	107591
12	M.T.Jag Arpan	GREAT EASTERN	OIL TANKERS (CRUDE	1986	18	36512	66183
13	M.T.Jag Lakshya	GREAT EASTERN	OIL TANKERS (CRUDE	1989	15	79552	152485
14	M.T.Jag Larjish	GREAT EASTERN	OIL TANKERS (CRUDE	1986	18	56456	99999
15	M.T. Jag Lamha	GREAT EASTERN	OIL TANKERS (CRUDE	1987	17		98214
16	M.T. Jag Leena	GREAT EASTERN	OIL TANKERS (CRUDE	1985	19		95007
17	M.T. Jag Laxmi	GREAT EASTERN	OIL TANKERS (CRUDE	1999	5	58374	105051
18	M.T.Sisoli	Mercator Lines	OIL TANKERS (CRUDE	1980	24	51095	89922
19	M.T. Sadanand	Mercator Lines	OIL TANKERS (CRUDE	1986	18	52862	94752
20	M.T. Devsi	Mercator Lines	OIL TANKERS (CRUDE	1985	19	52629	94706
21	M.T.Sarla	Mercator Lines	OIL TANKERS (CRUDE	1986	18	56613	100488
22	M.T. RATNA ABHA	INDIA STEAMSHIP	OIL TANKERS (CRUDE	1982	21	40614	60300
23	M.T. Ratna Shalini	INDIA STEAMSHIP	OIL TANKERS (CRUDE	1987	17	55178	89960
24	M.T. LOKMANYA TILAK	SCI	OIL TANKERS (CRUDE	1975	28	47690	89411
25	M.T. VIVEKANANDA	SCI	OIL TANKERS (CRUDE	1974	29	47690	89371
26	M.T. B. R. AMBEDKAR	SCI	OIL TANKERS (CRUDE	1974	29	47690	89454
27	M.T. CHARTRAPATI SHIVAJI	SCI	OIL TANKERS (CRUDE	1974	29	47690	89490
28	M.T. SATYAMURTI	SCI	OIL TANKERS (CRUDE	1975	28	47690	89451
29	M.T. RAJENDRA PRASAD	SCI	OIL TANKERS (CRUDE	1975	29	63460	115853
30	M.T. SUBEDAR JOGINDER SINGH(PVC)	SCI	OIL TANKERS (CRUDE	1984	20	37855	67167
31	M.T.MAJ.DHANSINGH THAPA (PVC)	SCI	OIL TANKERS (CRUDE	1984	20	37855	67153
32	M.T.Naik JadunathSingh PVC	SCI	OIL TANKERS (CRUDE	1984	20	37855	67169
33	M.T.CO.HAV.MAJ.PIRU SINGH PVC	SCI	OIL TANKERS (CRUDE	1984	20	37855	67161
34	M.T.CAPT.GURUBACHANSINGH SALARIA	SCI	OIL TANKERS (CRUDE)			37855	67167
35	M.T.LANCENAIK KARAM SINGH	SCI	OIL TANKERS (CRUDE	1984	20	37855	67153
36	M.T.MAJ.SOMNATH SHARMA PVC	SCI	OIL TANKERS (CRUDE	1984	20	37855	67225
37	M.T. RAMA RAGHOBA RANE PVC	SCI	OIL TANKERS (CRUDE	1984	20	37855	67153
38	M.T. MAJ. SAITAN SINGH PVC	SCI	OIL TANKERS (CRUDE	1985	19	37855	67185
39	M.T. ADBUL HAMID PVC	SCI	OIL TANKERS (CRUDE	1985	19	37855	67164
40	M.T. CO.ARDESHIR BURZORJI TARAPORE	SCI	OIL TANKERS (CRUDE	1985	19	37855	67124
41	M.T. MOTILAL NEHRU	SCI	OIL TANKERS (CRUDE	1990	14	51778	94540
42	M.T. JAWAHARLAL NEHRU	SCI	OIL TANKERS (CRUDE	1992	12	51746	94512
43	M.T. ANKLESWAR	SCI	OIL TANKERS (CRUDE	1994	9	80130	147563
44	M.T. GANDHAR	SCI	OIL TANKERS (CRUDE	1994	9	80130	147474
45	M.T. MAHARAJA AGRASEN	SCI	OIL TANKERS (CRUDE	1995	9	80130	147469
46	M.T. GURUGOBIND SINGH PVC	SCI	OIL TANKERS (CRUDE	1995	9	80130	147498
47	M.T. ABUL KALAM AZAD	SCI	OIL TANKERS (CRUDE	1999	5	51793	92687
48	M.T. MAHARSHI PARASHURAM	SCI	OIL TANKERS (CRUDE	2002	2	51785	93322
49	M.T. Desh Bhakt	SCI	OIL TANKERS (CRUDE	2003	1	61978	110000
50	M.T. Desh Prem	SCI	OIL TANKERS (CRUDE	2003	1	61978	110000
51	M.T. Desh Rakshak	SCI	OIL TANKERS (CRUDE	2003	1	61978	110000
52	M.T.Desh Shakti	SCI	OIL TANKERS (CRUDE	2003	1	84261	146840
53	M.T.Desh Gaurav	SCI	OIL TANKERS (CRUDE	2003	1	61978	110000

A-5 : Ship details – one month data (March 2004)

Kandla

Vessel Name	Nationality	DWT	Origin / Destination	Commodity Handled	QTY	Import / Export	Type
C P Shivaji	India	89490	Mumbai	Crude Oil	48387	I	C
Europe	Liberia	25999	Mina - Al - Ahmadi	Crude Oil	26008	I	F
Shaitan Singh	India	67169	Mumbai	Crude Oil	48633	I	C
C V Raman	India	41123	Mumbai	Crude Oil	38189	I	C
Joginder Singh	India	67137	Mumbai	Crude Oil	49072	I	C
Iran Daylam	Iran	246477	Fujairah	Crude Oil	264584	I	F
Front Lady	Singapore	284487	Mina - Al - Ahmadi	Crude Oil	274337	I	F
Pinto Glorry	Panama	298411	D Seno	Crude Oil	260061	I	F
C V Raman	India	41123	Panna High	Crude Oil	38235	I	C
Europe	Liberia	267000	Basrah	Crude Oil	256412	I	F
Dorado Star	Liberia	304707	Bonny	Crude Oil	258140	I	F
Navigin	Malta	274444	Mina - Al - Ahmadi	Crude Oil	271800	I	F
Tassels	Malta	96922	Kuwait	Crude Oil	75712	I	F
Jadunath Singh	India	67164	Mumbai	Crude Oil	49310	I	C
Homi Bhabha	India	41126	Panna High	Crude Oil	48493	I	C

Sikka

Vessel	Flag	DWT	POD/:L	Commodity	Quantity	Import/ Export	Type
Velchi OS	Malta	239783	Al-Khafgi	C.Oil	242321	I	F
New Canecassia	Panama	299992	Cabinda	C.Oil	273349	I	F
Dynamic City	Panama	244651	Rastamra	C.Oil	237996	I	F
Appolo	Liberia	251865	Rastamra	C.Oil	252419	I	F
Sea Gulf	Liberia	245653	Basrah	C.Oil	249508	I	F
Lania	Panama	248050	Rastamra	C.Oil	229438	I	F
Front Vandas	Singapore	285872	Sirri Island	C.Oil	280484	I	F
New Horizon	Mashall	151445	Russia	C.Oil	144813	I	F
Gilo	Norway	243727	Rastamra	C.Oil	239568	I	F
Marble	Bahama	149999	Ras Sukhair	C.Oil	131535	I	F
Front Ihghnen	Singapore	284317	Serpentina	C.Oil	256411	I	F
Front Granite	Norway	149999	Al-Khafgi	C.Oil	144022	I	F

Mumbai

Vessel Name	Nationality	DWT	Origin / Destination	Commodity Handled	QTY	Import / Export	Type
NK. JADUNATH SIN	INDIAN	67169		Crude Oil	48620	E	C
C.P. SHIVAJI	INDIAN	89490		Crude Oil	65333	E	C
SUB JOGINDER SIN	INDIAN	67169		Crude Oil	54725	I	F
SUB JOGINDER SIN	INDIAN	67170		Crude Oil	49073	E	C
NK JADUNATH SIN(	INDIAN	67169		Crude Oil	49090	E	C
GURU GOBIND SIN(	INDIAN	147498		Crude Oil	95857	I	F
JAG LAMHA	INDIAN	98214		Crude Oil	83512	I	F
GANDHAR	INDIAN	147474		Crude Oil	94729	I	F
SUB JOGINDER SIN	INDIAN	67169		Crude Oil	55564	E	C
SATYAMURTI	INDIAN	89351		Crude Oil	49099	I	F
NK JADUNATH SIN(	INDIAN	67169		Crude Oil	49222	E	C
DESH PREM	INDIAN	113976		Crude Oil	74897	I	F
B.R. AMBEDKAR	INDIAN	89454		Crude Oil	49322	E	F
GURU GOBIND SIN(	INDIAN	147468		Crude Oil	96122	I	F
C.V. RAMAN	INDIAN	41123		Crude Oil	37560	E	F
MAHARSHI PARASI	INDIAN	93222		Crude Oil	68377	I	F
GANDHAR	MALAYSIAN	147474		Crude Oil	95628	I	F
NK JADUNATH SIN(	INDIAN	67169		Crude Oil	49121	E	C
B.R. AMBEDKAR	INDIAN	89454		Crude Oil	38098	E	C

Mangalore

Vessel Name	Nationality	DWT	Origin / Destination	Commodity Handled	QTY	Import / Export	Type
Tassels	Malta	96922	Iran	Crude Oil	96080	I	F
Maharshi Karve	India	123450	India	Crude Oil	59180	I	C
Silver Iris	Panama	88387	Saudi Arebia	Crude Oil	85907	I	F
Satya Murty	India	87840	India	Crude Oil	45372	I	C
Sarla	India	100488	Iran	Crude Oil	98689	I	F
Afroditi	Bahamas	127575	Saudi Arebia	Crude Oil	93429	I	F
Tassels	Malta	96922	Iran	Crude Oil	96088	I	F
Satya Murty	India	87840	India	Crude Oil	49358	I	C
Torm So Relianc	Liberia	154970	Iran	Crude Oil	92878	I	F
Lokmanya Tilak	India	87690	India	Crude Oil	64017	I	C
Silver Iris	Panama	88387	Saudi Arebia	Crude Oil	85493	I	F
Sarla	India	100488	Iran	Crude Oil	93172	I	F
B R Ambedkar	India	89454	India	Crude Oil	49546	I	C
Devsi	India	94706	Sudan	Crude Oil	79036	I	F

Cohin

Vessel Name	Nationality	DWT	Origin / Destination	Commodity Handled	QTY	Import / Export	Type
M.T B.R Ambedkar	IND	89454	Arab Light Crude	Crude Oil	65570	I	F
Sorena	PNM	86408	Arab Mix Crude	Crude Oil	72560	I	F
M.T Desh Prem	IND	113928	Masila Blend Crude	Crude Oil	72472	I	F
C.P Shivaji	IND	86077	Bh Crude	Crude Oil	65333	I	C
Naik Jadunath Singh	IND	67225	Bh Crude	Crude Oil	49090	I	C
Maj.Somanath Sharn	IND	67225	Arabian Extra Light C	Crude Oil	50655	I	F
M.T.B.R Ambedkar	IND	89454	Iraqui Crude	Crude Oil	66096	I	F
M.T Desh Bhakt	IND	113928	Arabian Extra Light C	Crude Oil	71311	I	F
Naik Jadunath Singh	IND	67225	Bh Crude	Crude Oil	49221	I	C
Melor	SIN	87768	Masila Crude Oil	Crude Oil	69017	I	F
Jag Lamha	IND	98214	Kuwait Export Crude	Crude Oil	78081	I	F
LMZ Valia	CYP	93336	Upper Zakkum crude	Crude Oil	69206	I	F

Chennai

Vessel Name	Load/ Dispatch por	Cargo	Cargo Qty	Impor/Export	Type
Desh Bhakti	Calcutta	Crude Oil	86000	I	C
Jawaharlal Nehru	Calcutta	Crude Oil	79000	I	C
Sadanand	Calcutta	Crude Oil	83000	I	C
Front Comor	Rastanura	Crude Oil	68016	I	F
Desh Bhakti	Haldia	Crude Oil	140500	I	C
Desh Bhakti	Haldia	Crude Oil	140500	I	C
C.V.Raman	Mumbai	Crude Oil	25000	I	C
Smba	Rastanura	Crude Oil	140000	I	F
Front Emperor	Rastanura	Crude Oil	8000	I	F
Cp.Shivaji	Bombay High	Crude Oil	37000	I	C
Onda	Rastanura	Crude Oil	120000	I	F
Lambardia	Rastanura	Crude Oil	96000	I	F
Lambardia	Rastanura	Crude Oil	96000	I	F
C.V.Raman	Mumbai	Crude Oil	24000	I	C
Jig Leena	Kakinada	Crude Oil	89000	I	C
Smba	Kuwait	Crude Oil	117000	I	F
Jig Leena	Rastanura	Crude Oil	95000	I	F
Front Lillo	Saudi Arabia	Crude Oil	136000	I	F
Motilal Nehru	Calcutta	Crude Oil	87000	I	C
Desh Prem	Brunai	Crude Oil	87000	I	F
Eirydice	Saudi Arabia	Crude Oil	89000	I	F

Vizag

Vessel Name	Nationality	Country	Cargo	Cargo Qty	Impor/Export	Type
Ankleshwar	India	Nigeria	Crude Oil	138852	I	C
Desh Prem	India	Nigeria	Crude Oil	80000	I	C
Desh Prem	India	Nigeria	Crude Oil	86000	I	C
Desh Prem	India	Nigeria	Crude Oil	95000	I	F
Desh Prem	India	Nigeria	Crude Oil	95000	I	C
Sun bridge	Bahamas	Nigeria	Crude Oil	135000	I	C
Sun bridge	Bahamas	Nigeria	Crude Oil	86000	I	C
Gandhar	India	Nigeria	Crude Oil	150000	I	F
L N K Singh	India	Ravva	Crude Oil	60000	I	F
L N K Singh	India	Ravva	Crude Oil	60000	I	C
L N K Singh	India	Ravva	Crude Oil	60000	I	F
L N K Singh	India	Ravva	Crude Oil	60000	I	F
L N K Singh	India	Ravva	Crude Oil	60000	I	F
Maharaja Agrasen	India	Nigeria	Crude Oil	140000	I	C
Maharaja Agrasen	India	Nigeria	Crude Oil	140000	I	C
Joginder Singh	India	Ravva	Crude Oil	53996	I	F
Jawaharlal Nehru	India	Ravva	Crude Oil	27000	I	F
Jawaharlal Nehru	India	Ravva	Crude Oil	31000	I	F