IC Value 2016 : 61.33| SJIF Impact Factor(2017) : 7.144| ISI Impact Factor (2013): 1.259(Dubai)|UGC J No :47335

Research Paper | Volume - 6, Issue- 2,February 2018|e-ISSN : 2347 - 9671| p- ISSN : 2349 - 0187

EPRA International Journal of Economic and Business Review

A STUDY ON ANALYSIS OF PETROLEUM OIL LIQUID TRAFFIC PERFORMANCE OF MAJOR PORTS IN INDIA

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ABSTRACT

India was the third-largest energy consumer in the world after China and the United States, and its need for energy supply continues to climb as a result of the country's dynamic economic growth. In this paper, explains the present position petroleum oil liquid product traffic by the Indian major ports. In particularly need and importance of POL product has an emerging global economy had opened up new avenues in all the sectors in general and maritime sector in particular. India's is the biggest POL importer in the world with $155bn and Kandla port is biggest port in India to handling of 55589 thousand tonnes in 2014-15 with number one position. The port location, equipment facilities are important for increasing the pol traffic of the major port. Hence the researcher conclude that the government of India established separate POL handling berth with special equipment facilities in all major ports and also it need independency for improvement of Liquid cargo handling in Indian ports.

KEYWORDS:

Petroleum, traffic, equipment, submarine, pipeline, and facilities.

I. INTRODUCTION

Ports are very important infrastructure facilities critical in international trade, as they provide linkages between international and domestic production and distribution networks. They are now transport centres and logistic platforms for international trade. The emerging global economy had opened up new avenues in all the sectors in general and maritime sector in particular. The maritime sector is popular in worldwide through economic liberalization, competition, upgraded technology and application of modern information technology. India is emerging as a current economy and become globally competitive particularly the port sector. India's International trade is carried on through the maritime transport and twelve major ports are playing the vital role in the overall economic development of the country. International trade of cargo normally carries with maritime transport. Cargo can be defined as the articles, products or the goods that are being transported for import and export via ship. However, this term is now being used to define commercial transportation of goods. Modern international trade comes into carry a wide variety of cargoes. But, the cargo mainly classified on the basis of usage and its purposes. Cargoes shall be divided into dry cargoes and liquid cargoes. The liquid cargoes are very important today for further development of industrial sector as well as economic development of nations. So, the researcher tries to study the Liquid cargoes traffic of Indian major ports.

II. SIGNIFICANCE OF POL PRODUCTS

Crude oil, petrol, fuel oil, vegetable oils and even wines all liquid products which are often transported on big tankers or through a pipeline to the next destination. A lot of liquid bulk passes through the sea route and in India major ports are great role played distribution of liquid bulk every year. For the refineries, crude oil is the raw material they need to produce new goods, such as fuel oil, petrol and kerosene. These products also find their way as liquid bulk to the next destination. The import and exports of the goods between countries is a very important component contributing to country's GDP. This international trade is mainly carried out by air or sea. Maritime trade in India has been accounting for over 95 per cent of India's total cargo volumes.[1] Out of the total international trade, most of the trade takes place through Major ports in India.

India was the third-largest energy consumer in the world after China and the United States in 2013, and its need for energy supply continues to climb as a result of the country's dynamic economic growth and modernization over the past several years. India was the fourth-largest consumer of crude oil and petroleum products after the United States, China, and Japan in 2015, and it was also the fourth-largest net importer of crude oil and petroleum products. The gap between India's oil demand and supply is widening, as demand in 2015 reached nearly 4.1 million barrels per day (b/d),

compared to around 1 million b/d of total domestic liquids production.[2]

III. Objectives of the Study

The researcher framed the following objective from the existing review of literature and for the study.

i. To identify the POL traffic handling facilities of the Major ports in India.
ii. To study the POL traffic performance of the Major Ports in India.

IV. METHODOLOGY OF THE STUDY

To study the objectives the data's have been collected from secondary sources only. Secondary data of petroleum and liquid product handling by the port has been collected from Indian Port Association annual statistics, annual reports of major ports, Ministry Petroleum and published national and international articles.

V. POL EQUIPMENT FACILITIES OF INDIAN MAJOR PORTS

Liquid bulk traffic of the major port is negligible level with infrastructure facilities of the port especially special equipment is essential for POL loading and unloading liquid bulk cargo. POL handling is difficult by manmade handling because it is very hazarders and dangerous as well as to pollute the environment. Therefore it need the following facilities of LPG pipeline, paraxlene pipeline, flexible hoses, tower monitor mooring dolphin and flexible berthing dolphin with fenders. However the table below shows that existing available pipeline and marine arms equipment facilities of the major ports in India.

Table 1
Pipeline Facilities

(No. x DIA in mm)

KDS	HDC	PPT	VPT	ChPT	TPT	CPT	NMPT	MoPT	MPT	JNPT	KPT
-	4x14"	3x700	1x900	1x762	2x500	1x750	1x900	1x250	1x42"	3x200	2x1050
	2x8"	mm	mm	mm	mm	m	mm	mm	1x36"	mm	mm
	5x20"	1x450	3x600	2x350	1x450	2x400	1x600	1x450	3x30"	1x250	3x24"
	1x30"	mm	mm	mm	mm	m	mm	mm	1x8"	mm	22x03"
	2x24"		1x400	1x500	1x404		1x450	1x850	2x200	3x400	06x04"
	2x4"	1x1200	mm	mm	mm		mm	mm	mm	mm	04x06"
	1x6"	mm	7x350		1x350		2x300	1x600	1x600	1x750	42x08"
	1x12"		mm		mm		mm	mm	mm	mm	17x10"
	1x32"		3x300		2x250		5x400		7x300	2x450	09x12"
	1x48"		mm		mm		mm		mm	mm	04x14"
			3x200		2x200		4x300		1x350	5x600	04x16"
			mm		mm		mm		mm	mm	09x20"
			1x350		1x100		2x200				08x24"
			mm		mm		mm				02x2.5"
			2x400				1x250				03x03"
			mm				mm				01x04"
			3x200								09x08"
			mm								02x12"
			1x250								01x14"
			mm								01x06"
			3x300								01x22"
			mm								05x24"

Source: *Compiled by the researcher from Indian port association annual report.*

Modern pipeline facilities helpful to port authority to reduce the turnaround time of ships and reduce the expenses for handling of POL product. However, it protects pollution of sea water from leaked petroleum products. All the major ports have a pipeline and marine arms facilities except the Haldia dock system. The table above shows that the Kandla port, New Mangalore port and Visakhapatnam port having more number of pipeline facilities among the other major ports. But Mumbai port, New Mangalore port and Kandla port having the more number of marine arms facilities. So, it reveals that the major ports of Kandla, Mumbai, New Mangalore and Visakhapatnam are a familiar port to handling the POL product in India as per the equipment facilities.

Table 2

Marine Arms and Other Equipment Facilities

KDS	HDC	PPT	VPT	ChPT	TPT	CPT	NMPT	MoPT	MPT	JNPT	KPT
-	5 at HOJ II 2 at HOJ I 2 at HOJ III	Crude-2 HSD-1 SKO-1 FLEXIBLE HOSE 400 mm - 6 Nos.	3 - 400 mm	5 - 300 mm 4 - 400 mm 2 - 300 mm	2 - 300 mm	4 - 300 mm	6-200 mm (2000 tph Capacity each) 2 Loading Arm 200 mm for LPG Flexible Hose + Loading Arm for LPG		5x12" at 4JD 5x12" at 3JD 3x12" at 2JD 5x12" at 1JD 1x12" 2x10" 3x8"	6x12" DIA	2x16" DIA 2x8" DIA - - 2x10" DIA 3x10" DIA 1x8" DIA 3x300 DIA
-	-	Submarine Pipeline to Storage Tank 19.25 K.M.	Submarine Equipped with Booster Pumps	-	-	Submarine Pipeline Jetty to Shore Jetty to Shore	-	-	Submarine Pipeline 5.1 km from Island to Shore	Facilities for Storage of Liquid Cargo is at Tankfarm, set up by Pvt. Operators on JNPT leased land outside custom bond area	Submarine Pipeline 8 km - 2x8" DIA Flexible Hoses

Source: Compiled by the researcher from Indian port association annual report.

The major port is always located in busiest city therefore submarine pipeline is helpful in POL importer to carrying the crude and harmful liquid product from ships to refineries for safe handling and without disturbing the public traffic. The submarine pipeline is essential equipment to reducing transportation cost of shore to store with lessor time. But, in India Paradip port, Visakhapatnam port, Cochin port, Mumbai port and Kandla port has a submarine pipeline facility remaining seven major port still is not established.

POL Product Traffic of Major Ports

The Indian Ocean historically has been a major transit route, bringing crude oil from suppliers in the Persian Gulf and Africa to markets in Asia. Tanker sea lanes pass near Indian waters between major chokepoints such as the Strait of Malacca and the Strait of Hormuz.[3] The majority of Indian oil ports are located on the country's western side to receive shipments of crude oil that pass through these routes.

Table 3
POL Traffic Performance of Major Port ('000 tonnes)

Name	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total	Average	Rank
KDS	4934	5181	4523	3436	724	878	682	708	717	626	22409	2240.9	10
HDC	17689	18054	17723	16949	9305	9654	7909	6195	6098	5500	115076	20922.91	4
PPT	910	1376	1765	3240	11647	12845	15091	16467	17602	17976	98919	9891.9	8
VPT	16941	18178	18523	19758	18291	19242	17428	13501	12960	13129	167951	16795.1	5
ChPT	13113	12987	12713	13132	13321	13991	13290	13376	12877	12659	131459	13145.9	6
TPT	774	626	464	503	514	741	630	547	299	366	5464	546.4	11
CPT	9641	10475	11300	10492	11938	12121	14084	14027	14289	14016	122383	12238.3	7
NMPT	22392	21868	21782	21328	21339	21551	22245	22538	22944	21409	219396	21939.6	3
MoPT	833	786	874	1038	964	939	923	823	527	571	8278	827.8	12
MPT	27781	24281	37074	34571	34538	32990	30611	34751	35980	35837	328414	32841.4	2
JNPT	2545	2625	2188	4551	4916	5043	4845	4126	4107	3330	38276	3827.6	9
KPT	24297	29711	38225	45538	46970	48426	46938	54544	52906	55589	443144	44314.4	1
Total	141850	146148	167154	174536	174467	178421	174676	181603	181306	181008			

Source: *Compiled by the researcher from Port Statistics Reports.*

The India is importing crude oil from several countries like Iran, Libya, Sudan, Venezuela, Saudi Arabia and Iraq. Among these countries Saudi Arabia is India's largest oil supplier with a 20 per cent of India's crude oil imports. In total 58 per cent of India's imported crude oil came from Middle East countries especially Saudi Arabia and Iraq. The second largest supplier of oil is from Africa continuous with 19 per cent and Nigeria is the major contributor. Indian oil countries like to Import crude oil mostly from Africa region due to sweet and light crude oil grades. The western Hemisphere accounted for 18 per cent of India's crude oil imports from Venezuela, this region has grown substantially over the past several years. India has increased its total net oil imports from 42% of demand in 1990 to an estimated 75% of demand in 2015.[4] India's demand for crude oil and petroleum products is projected to continue rising, barring a serious global economic recession. Oil import dependence will continue to climb if India fails to achieve production growth equal to demand growth.

India's is the biggest POL importer in the world with $155bn and it is the key export in 2012 was petroleum products which generated $56bn.[5] However, the table 3 shows that the POL product handling by the major ports of India.

The above table explains the petroleum oil liquid product traffic of the major ports during 2005-06 to 2014-15. It reveals that the Mumbai port handling 26,781 tonnes of POL product during 2005-06 and it is highest among the other ports. The Mumbai port occupied number one position in beginning of the study period. But subsequent year the performance of the port is flexible with previous year and is going down second position.

The table reveals that the Kandla port, POL traffic handling performance is continuously increased to 55589 tonnes from 24297 tonnes during the study periods. The Kandla port is the dominant port and it positioned number one after 2005-06 among the major ports during the study period.

The New Mangalore port is another important port to handling the POL product. It performance start with 22,392 tonnes in 2005-06 and decreased to 21,409 tonnes at the end of the study period. However, it stands at third rank continuously all the study periods. The table is also stated that Haldia dock complex, Visakhapatnam port, Chennai port and Cochin port occupy the 4th, 5th, 6th and 7th rank respectively.

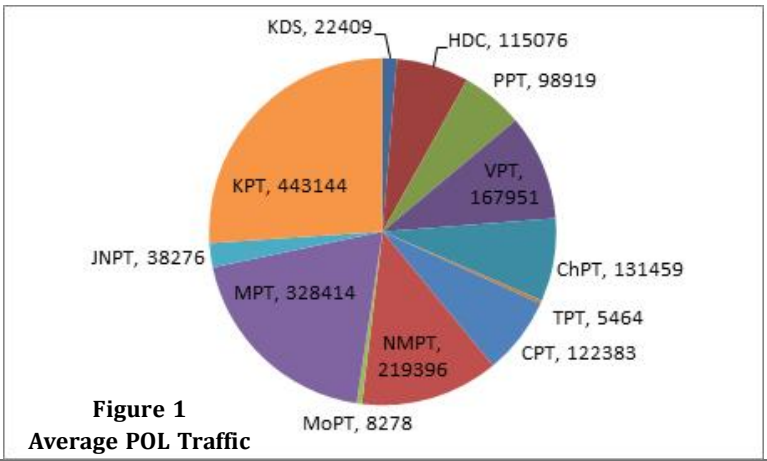

Figure 1
Average POL Traffic

The above Pie Diagram stated that average POL product handling by the port during the study period. It explains the position of the Major Ports for handling POL product. However the researcher understood that from above interpretation and tables POL Traffic performance of the port purely depend on pipeline facilities and marine arms facilities of the port because which port having more modernized facilities it is eminent port of POL traffic.

VI.FINDINGS

The following findings are found that by the researcher from the above interpretation and analysis of POL traffic by the major ports in India.

Kandla Port is having modern pipeline facilities with flexible horses and it include submariner pipeline. So the Kandla port POL traffic is 30.66 per cent from total of 1,81,008 thousand tonnes during 2014-15 and it dominating number one position among other major ports.

The West Coastal port of India having suitable location and adapting marine equipment facilities for handling of POL product from other countries therefore New Mangalore Port, Mumbai Port, and Kandla port is dominating with East Coast ports of India.

The researcher reveals that Haldia dock complex performance of POL product is declined continuously from all the study period due to restriction of berth draft and development of submarine facilities in neighbour competing port of Paradip port.

The oldest port of Mumbai port is number one position till 2005-06 for handling of POL product but it moved to second position due to development of Kandla port. However the POL traffic increased 27,781 to 35,837 thousand tonnes from the study period.

The overall POL traffic performance of the major port in India is flexible with previous year but total POL products of major ports increased from 141,850 thousand tonnes to 1,81,008 thousand tonnes in 2005-06 to 2014-15.

VII.CONCLUSION

Petroleum, oil liquid product is essential for energy production. The POL product international trade depend on maritime transport of India especially 12 major ports of India. The Indian Government was implemented many policies to increasing the domestic production of POL product in recent past. However domestic consumption also increased due to industrialization. So the government of India can take necessary action to establishment the modern facilities with specialised berth for handling of POL product to sustainability of POL product traffic in India. So the research conclude that establishing the pipeline and marine arms facilities with specialized berth for development of POL product of all the Major Port.

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