A Study on Green Practices Management in Petroleum Logistics

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Abstract

Environmental issues such as global warming, carbon emissions, toxic substance usage, and resource scarcity has escalated over the past decades. The Government, Policy makers andNon Government Organization are advocating for going green. The entire humanities have responded to this by applying green principles. Logistics involves all the activities that move products and information to, from and among the members of supply chain. The supply chain provides a framework for business and their suppliers who team-up to reach goal services and information efficiently to ultimate consumers. This process involves in petroleum logistics also but there are more issues related to leakage exploitation of the natural resources. The waste and emissions caused by the supply chain have become one of the main sources of serious environmental problems including global warming and other health problem of human being. So the researcher has very much interested for to identify the problem of petroleum logistics and other issues in the daily business life.

Key words: *Environment, Logistics, Supply chain management, and Green Practice management*

I. INTRODUCTION

Logistics deals with reaching products or services where they are wanted and when they are wanted. Any manufacturing or marketing activities is difficult to achieve without any logistical planning. The logistics involves co-ordinate efforts of transportation, warehousing, packaging and inventory management. Logistics define " the Process of planning, implementing, and controlling the efficient effective flow and storage of goods, services, and related information from of origin to point of consumption for the purpose of conforming to customer requirements" The above definition includes inbound, outbound, internal, and external movements, and return of materials for environmental purposes. Logistics is the integrated management of all the activities required to move products through the supply chain. For a typical product this supply chain extends from a raw material source through the production and distribution system to the point of consumption and the associated reverse logistics. The logistical activities comprise freight transport, storage, inventory management, material handling and all the related information.The supply chain management practices and strategies that reduce the environmental and energy footprint of freight distribution. It focuses on material handling, waste management, packaging and transport. Firms have come to realize that recycling, reduce energy requirement, reduce gaseous & solid pollutants & conserve raw materials. As a result of adopting environment friendly logistics practiceshave also become competitive and improved their financial performance.

II. REVIEW OF LITERATURE

Petroleum Logistics involves procurement, transportation, inventory, customer service and distributions. The world forum of petroleum products continues to stress the importance of balancing a supply oriented fuel policy with continued environmental progress. Historically balancing s supply oriented fuel policy with continued environmental progress. Historically refinery planning begins with setting constrains, target & optimizing. The resulting optimized plan is made for short term time frame. However as we look beyond the refinery it include more of the supply chain which becomes long term objective.

Petroleum Logistics is formed with one simple mission in mind- to bring value and increased profitability to clients business through highest quality products and outstanding service to clients every time conduct business. Petroleum logistics is an aviation fuel is an aviation fuel and lubricants supplier, along with providing solutions from bulk fuel storage to environmental solutions.

Petroleum or crude oil is a naturally occurring, flammable liquid consisting of a complex mixture of Hydrocarbons of molecular weights and other liquid organic compounds that are found in geologic formation beneath the earth's surface. The petroleum industry includes the global processes of exploration, extraction, refining, transporting, and marketing petroleum products.

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Logistics is the integrated management of all the activities required to move products through the supply chain. For a typical product this supply chain extends from a raw material source through the production and distribution system to the point of consumption and the associated reverse logistics. The logistical activities comprise freight transport, storage, inventory management, material handling and all the related information.

Green Logistics:Is the supply chain management practices and strategies that reduce the environmental and energy footprint of freight distribution. It focuses on material handling, waste management, packaging and transport. Firms have come to realize that recycling, reduce energy requirement, reduce gaseous & solid pollutants & conserve raw materials. As a result of adopting environment friendly logistics practices, these firms have also become competitive & improved their financial performance.

A. Oil Supply and Demand in India

The oil and gas sector is among the six core industries in India and plays a major role in influencing decision making for all the other important sections of the economy. In 1997–98, the New Exploration Licensing Policy (NELP) was envisaged to fill the ever-increasing gap between India's gas demand and supply. India's economic growth is closely related to energy demand; therefore the need for oil and gas is projected to grow more, thereby making the sector quite conducive for investment. The Government of India has adopted several policies to fulfill the increasing demand. The government has allowed 100 per cent Foreign Direct Investment (FDI) in many segments of the sector, including natural gas, petroleum products, and refineries, among others. Today, it attracts both domestic and foreign investment, as attested by the presence of Reliance Industries Ltd (RIL) and Cairn India.

B. Market Size in India

India is expected to be one of the largest contributors to non-OECD petroleum consumption growth globally. Total oil imports declined by 10 per cent year-on-year in February 2017. Fuel consumption in India increased by 10.7 per cent to a 16-year high of 196.48 million tonnes (MT) in 2016. India is the fourth-largest Liquefied Natural Gas (LNG) importer after Japan, South Korea and China, and accounts for 5.8 per cent of the total global trade.3Domestic LNG demand is expected to grow at a CAGR of 16.89 per cent to 306.54 MMSCMD by 2021 from 64 MMSCMD in 2015. The country's gas production is expected to touch 90 Billion Cubic Metres (BCM) in 2040 from 23.09 BCM in FY2016-17 (till December 2016). Gas pipeline infrastructure in the country stood at 15,808 km in December 2015.State-owned Oil and Natural Gas Corporation (ONGC) dominates the upstream segment (exploration and production), producing around 25.93 MT of crude oil, which is approximately 60.5 per cent of the country's 36.95 MT oil output, as of March 2016.

- Oil consumption is estimated to expand at a CAGR of 3.3 per cent during FY2008–16E to reach 4.0 mbpd by 2016
- Due to the expected strong growth in demand, India's dependency on oil imports is likely to increase further
- Rapid economic growth is leading to greater outputs, which in turn is increasing the demand of oil for production and transportation
- With rising income levels, demand for automobile is estimated to increase
- India will overtake Japan to become the world's third largest oil consumer behind the US and China by 2025.India has approx 56, 190 petrol stations as on March 2016. Almost 25 000 of these belong to Indian Oil, 13 000 each to Bharat Petroleum and Hindustan Petroleum. The Tamil Nadu has 4, 278 number of petrol station.(Latest update: June, 2017)

C. Research Design

Under this convenience sample method was used. The study is conduct on the basis of survey carried out in Trichy Districts. The data for survey is collect through direct personal interview with dealers in All Tamil Nadu petroleum dealers Association & truck driver

D. Objectives & Goals

The main objective of logistics is to co-ordinate these activities in way that meets customer requirements at minimum cost. In the past this cost has been purely monetaryterms. As concern for the environment crises, companies must take more account of the external costs of logistics associated mainly with climate change, air pollution, noise vibration and accidents. This research project is examining ways of reducing these externalities and achieving a more sustainable balance between economic, environmental and social objectives.

E. National and International Importance

The petroleum industry includes the global processes of exploration, extraction, refining, transporting and marketing petroleum products. All effort of a business organization to modify develops, produce and distribute products or services in such a manner so as to preserve and improve ecological environment for the sake of generations to come constitute a green business practices.

F. Objectives

* To identify the various problems faced during petroleum transit

* Toestimatethe loss during petroleum transit* To estimate the effect of petroleum loss on environment

* To understand various crisis in petroleum Retail Business

* To develop an effective green logistics system in petroleum transit

* To find out the financial loss due to evaporation loss

III. METHOD OF DATA COLLECTION

A. Primary Source

Primary data during the course of the project study is collect through interview method. Personal interview is made to collect data from the respondent.

B. Secondary Source

Secondary data is collect from (i) Technical & Trade Journals (ii) Reference book, magazine & newspaper (iii) Articles from Net

C. Universe

The Universe of research is all the petroleumdealersin Tamil Nadu

D. Sample Area

For the minor level of research, I take Three Districts from Tamil Nadu such as Tiruchirappalli, Ariyalur and Pudukottai. The primary data collected only from the Tiruchirappalli district.

E. Sample Size

Total sample size is which include dealers, truck drivers and Salesmen

Dealer 50, Driver 50 persons and salesmen 50 persons

F. Data Analysis (Petrol storage and Distribution)

1. Petroleum Terminal(Refinery outlet)

2. Petrol Distribution Centre-Retailer (Underground tank)

3. Motor Transport(petrol filling)

Most of retailers in this field are using the tanker trucks for bringing in petrol to the outlet, where they will be stored in an underground container for further distribution

The tanker truck's schedule is as follows:

- The tanker trucks reaches the refinery for filling in the fuel ordered by the retailer, where they follow in queue to reach their respective gate for fuel (normal waiting time is 2 to 3 hours)
- The computerized machine will fill the tanker of the truck fully (12 000 liters if it's a standard tank truck)within 15 minutes.
- The tanker with a definite time schedule reaches the retailer (The time is specified by the oil company)
- The fuel in the tanker is transferred into the underground compartments of the retailer through unconventional means

The retailers supply the fuel to its customers through a machine which will take fuel from the compartment. As per our observation and interview we could found that there are two types of losses – operational loss & evaporation loss. The operational loss incurs during the retail sale to customer (which vary depends on the quantity of sales). The evaporation lossit happens at various levels. Firstly the loss incur while filling the underground tank of retailer from company vehicle (50-80 liters per load). Secondly loss occurs during the level checking of the petrol in the underground tank of retailer(5-10 liters loss due to variation in air pressure).

Petrol is a form of hydro carbon which is highly sensitive to temperature; Petrol is made up of aliphatic and aromatic hydrocarbons along with toluene and benzene. In this, toluene is an explosive and it is used as TNT (trinitrotoluene) in explosive. That's why petrol is highly inflammable and can explode when it comes in contact with fire.

The retail outlets face petrol losses in two forms;

1. Losses due to evaporation
2. Losses due to expansion

The evaporation occurs when the fuel from petrol tanker transfer to the underground

tank of the petrol pumps and when the petrol is supplied to the consumers. Even though India as a nation developed hugely it is to be noted that Legal meteorological department, the sole agency to verify the levels of petrol in petrol pumps, still uses crude system to check the levels.

IV. FINDING AND SUGGESTIONS

The question that comes to our mind is:
The problems faced during petroleum transit?

What are the environmental impacts for these losses?

How we can develop an effective green logistics system?

A. *Problems in petroleum Transit*

- The amount of petrol that can be transported in a usual petrol tank truck is very limited (12 000 liters)
- The crude system for filling the truck tank from terminal
- Other problem related to transportation system is determine the route for transit
- Evaporation loss while filling the underground tank

B. *Suggestions*

- To develop a system of using high capacity tankers(24 000 liters capacity)
- Introduce token system for tank trucker to minimize the queue for filling
- Install GPS system in tankers to reduce the transit time by knowing the shortest as well as exact route
- The underground tank must be connected to a vapor recovery unit

C. *Green in Petrol Storage & Distribution*

The storage and distribution of petrol is associated with the emission of volatile organic compounds due to the volatile nature of petrol. Green in petroleum logistics aims to limit the emissions of petrol vapor during the storage of petrol at terminals and its subsequent distribution from terminals to service station. There are several technical requirements governing the reflective coatings of tanks at terminals, roof for storage tanks, bottom loading of road tankers, inland waterway and rail vessels and vapor recovery whilst filling underground storage tanks at service station. Green in petroleum logistics is intended to reduce emissions to atmosphere of Volatile organic Compounds from the operations, installations, vehicles and vessels used for storage, loading and transport petrol from one terminal to a service station

D. *The Requirements to be Implemented are:*

- Above ground tank must be painted with high heat reflectance paint
- Tanks with external floating roofs must have primary and secondary seals between the tank wall and floating roof
- Fixed roof tanks must either be connected to a vapor recovery unit or be filted with an internal floating roof
- Mobile container need to be designed and operated so as to vapors returned from storage installation.

V. CONCLUSION

Petroleum is vital to many industries, and is of importance to the maintenance of industrialization civilization itself, and thus is critical concern to many nations. As petroleum is a non-renewable natural resource the industry is faced with an inevitable eventual depletion of the world oil supply. We should develop a strategy of green in usage as well as in the distribution of petrol. The environmental impact of petrol is that it produces greenhouse gases and other air pollutants as by-products. Pollutants include nitrogen oxides, sulphur dioxide, volatile organic compounds and metals. The best option for the logistics of petroleum is to apply green practice management in petroleum logistics.(i:e minimizing the petroleum loss during transit).

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