Challenges Associated With Effective Fuel Management in Oil Marketing Companies

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Abstract:
This study outlines the topmost challenges faced by the Oil & Gas industry in Pakistan specifically the Oil Marketing Companies (OMC). It also assesses the awareness level for Fuel Telemetry System for effective fuel management across the supply chain in order to address the identified problems which include fuel leakages, contamination, fuel theft, spillages, reconciliation inaccuracies, product loss due to volatility & calibration and instrumentation challenges for precise measurements. The analysis of the survey results indicate that majority of the Oil Marketing Companies are facing issues mainly related to fuel loss & leakages (Ranked 8/10), incompatible systems (6.7/10), real-time fuel stock information gathering (6.6/10). 47% of the respondents indicate fuel losses of greater than 500 Liters per month on an average. The industry mainly relies on manual stock reconciliation methods (12%) and manual collection of information instead of an integrated technological application. Findings reveal that the level of awareness about Fuel Telemetry systems is acceptable (50%) but no Oil & Marketing Company has yet implemented such a system in Pakistan. However, the industry must look into the trade-offs before actually resisting or declining the application of Telemetry in effective Fuel Management.
Keywords: *Fuel leakages, Fuel contamination, Fuel theft, Fuel telemetry, Tracking devices.*

1. INTRODUCTION

Oil and gas industry in Pakistan can be subdivided into three mainstream sectors, the upstream sector which is the exploration & production sector. Main operations of this sector include searching for the potential crude oil and natural gas fields and subsequently drilling and operating these sites for exploration of these resources. The midstream sector mainly involves refining of the petroleum crude oil, processing and purifying the raw natural gas for supply. The downstream sector includes marketing and distribution of the final products.

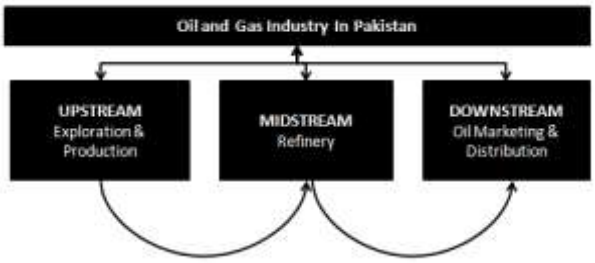

Figure 1: Structure of Oil & Gas Industry in Pakistan

The local OMC sector has mainly 12 major authorized operators with the largest player being the government owned entity, Pakistan State Oil (PSO) with a market share of 55% during 2016. Shell Pakistan Limited (Shell), Attock Petroleum Limited (APL), Total Parco Pakistan Limited/Total Parco Marketing Limited (Total) and Hascol Petroleum Limited (Hascol) are other major oil marketing companies in Pakistan. The top 5 players represent almost nine-tenth of industry sales. Complexity in supply chain management along with high capex required for volumetric growth has kept the industry structure at a semi-oligopolistic level, with less players ruling the market. (Talha Iqbal, 2016).

Transportation of oil from its source to the OMCs is through pipelines or through other means such as independent contractors by roads and railways. Most of the time, it is through pipelines that run from the refinery to the storage terminals of the respective oil marketing companies. Once stored in the terminals of the oil marketing companies, it is then the property of the OMC, and is recorded as a purchase. The OMC

then retails and markets the oil and distributes it through different channels such as pipelines, tankers, rail bogies for sale to the ultimate customers.

Oil & Gas Exploration & Production Companies	Pakistan Oilfields Limited
	Pakistan Petroleum Limited
	Oil & Gas Development Company Limited
	Mari Petroleum Company Limited
	Sui Southern Gas Company
	Sui Northern Pipeline Limited
Refineries	Attock Refinery Limited
	Byco Refinery Limited
	Pak Arab Refinery Limited
	Pakistan Refinery Limited
	National Refinery Limited
Oil Marketing Companies	Pakistan State Oil
	Attock Petroleum Limited
	Shell Pakistan Limited
	Hascol Petroleum Limited

Table 1: Oil & Gas Companies in Pakistan

From the downstream perspective, fuel management is extremely important in order to ensure correct amount of fuel in the tanks and to minimize losses occurring in the supply chain. When talking about losses in underground storage tank at retail stations there are number factors that are causing the losses.

4. CONCLUSIONS

Fuel monitoring in oil industry is of great importance. Various challenges that are faced by Pakistan oil industry are causing losses not only to the company but also the retailer. An end to end effective fuel monitoring system is required for mitigation and controlling the risks. Research and study revealed that such system is not being used by Pakistan oil industry. Survey result revealed that there is not much awareness of a telemetry system in the Pakistan Oil Industry. It is high time to implement such a solution to improve performance.

Problems in the Pakistani OMCs such as fuel leakages, theft, fuel reconciliation errors, evaporation & temperature loss can be effectively monitored and controlled through fuel telemetry system in underground storage tanks at retail stations and in the tank lorry that carries the product. Such system can provide next generation automation and measurements that can increase business profitability, reduce fuel losses, improve customer refueling experience and reduce operational risks.

In the light of the literature review& survey analysis, the problems discussed above could be addressed in many ways using the telemetry system to integrate information collection, analysis, and pinpoint the problems.

Problems	How Telemetry can be useful?
Fuel Leakages	Timely detection of leakages at an early stage could be possible
Fuel theft & contamination	Integrated sensor based technology would enable the detection of any mix-ups & thefts through fuel Quality
Fuel Reconciliation errors	Automatic and accurate reconciliation could be performed with real-time information
Evaporation losses	Effective temperature controlling devices that are integrated centrally
Spills	Efficient fleet management, collect ion of data from fuel level sensors, information about tanker movements, tanker location

Table 2 Usefulness of Telemetry in OMCs

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