As India’s chemical trade rises, the pressure on the already overburdened Indian ports will increase. A review of current liquid chemical handling infrastructure and performance at ports highlights a clear need for better planning and a more supportive policy framework. Going ahead, ‘chemicals’ are expected to be among the most attractive cargo types and ports must align their capabilities to leverage this opportunity say Siddharth Paradkar and Manjula Singh of Tata Strategic Management Group.
Growth in chemical trade

Indian chemical industry has been growing at 10-15% per annum over the past few years. Rising chemical exports is a significant contributor to this growth. At the same time, imports for certain chemical products, in which India is traditionally deficit, have increased with rising demand from growing domestic end-use sectors.

Going ahead, chemical trade volumes are set to grow at a fast pace. Increasing volumes will merit a shift from containerized movement to bulk, increasing the burden on Indian ports.

Of the over 70 operational ports in India, the 13 major ports handle over 50% of the country’s trade by volume. Utilization rate of these major ports has been hovering between 80 to 90% over the past 3 years. When compared to international average of 70% utilization, these rates indicate potential overburdening of existing infrastructure at India’s major ports. There is a need for capacity ramp-up, especially for chemical commodities, which are largely neglected in favour of bulk commodities such as iron ore and coal.

Ports with major liquid chemical traffic such as JNPT (6.9 lakh tonnes) and Kandla (56 lakh tonnes) have liquid chemical storage capacities of 7.4 lakh and 8.4 lakh KL, respectively. A comparison of number of pipelines, type of tanks, distance of tanks from water-front etc. for chemical terminals at these ports with terminals at some of the leading international ports like Antwerp, sharply brings out the inadequacy and lack of planning behind chemical infrastructure at Indian ports (see figure 4).

Inadequate number of stainless steel tanks and pipelines restrict the different types of products that can be handled by the tank farms. Furthermore, limited number of pipelines from the water-front to the tank farm, directly impact the turnaround time of vessels and duration of port stay, thereby increasing costs.

Turnaround time also increases with distance between storage tanks and the water-front. Though the Coastal Regulation Zones (CRZ) notification by the Ministry of Environment and Forests (MoEF) allows for construction of storage terminals for several petroleum products in CRZ-II zones, it does not accommodate chemicals and petrochemicals. This means that liquid chemical storage terminals have to be built outside CRZ zones, which are far away from the water-front.

In addition to the inadequate port infrastructure, lack of connectivity to hinterland and the absence of multimodal transport options drive up distribution costs for importers and create a challenge in moving products inland. The challenges become especially acute for chemical products in view of strict SHE norms associated with the products. Liquid chemical transportation through rail requires specialized wagons in view of applicable regulations. However, Indian Railways has little focus on providing such wagons specifically for the movement of liquid chemicals. This is ironical considering the fact that rail is considered to be a safer mode for transporting hazardous chemicals compared to road, which is currently the predominant transportation mode for chemicals in India.

On the other hand, the Cabotage law restricts movement of foreign flag vessels along coastal routes making unloading and distribution of chemicals along the coast challenging.
As chemical trade increases, the nature of cargo to be handled will become more specialized and will have specialized handling requirements. However, 64% of berths at major Indian ports are general cargo berths (see figure 5).

Waiting time (pre-berthing time) for bulk liquid vessels (which include POL and liquid chemicals) is long, and goes as high as 70 hours at Haldia and 60 hours at JNPT (see figure 6). This is abysmal compared to other advanced ports such as Rotterdam which do not have a concept of waiting time.

As Indian ports gear up for handling the increased chemical volumes expected in the future, there is a need for a focused effort on better planning, infrastructure up-gradation, policy reforms and SHE awareness & training.

In view of future volumes and advanced parcel tankers, ports handling large liquid bulk chemical volumes, must invest in setting up high quality, dedicated pipelines which allow multi-product discharge and faster discharge rates for unloading & loading of chemical cargo. Pipeline networks should be well planned and layouts optimized based on unloading and storage locations at port.

Ports must create high capacity berths with specialized handling equipment and infrastructure for chemical products. Material handling teams and labour need to be trained in effective use of the specialized equipment and precautions associated with handling of chemicals.

Policy reforms such as making the coastal shipping or cabotage law more flexible for foreign flag vessels to operate on Indian waters would enable availability of vessels for distribution through coastal movement. Amendment in the CRZ law too is critical for reducing capital requirement and operating costs of tank farms. High volume chemicals such as Phosphoric Acid, Ammonia, Xylenes (PX, OX, MX), Methanol and MEG should be included into the permitted products list, to allow storage tanks to be built closer to the water-front. This would mean shorter pipelines, reduced capital investment, ability to lay larger number of pipelines, reduction in loss of time for product change over, faster discharge and quicker turnaround of ships.

Improved efforts on SHE training and awareness are also required. Introducing specialized courses on chemical handling and related SHE norms in maritime training institutes would help in ensuring availability of appropriately skilled labour trained in safe handling and storage of chemicals.

Going ahead, ‘chemicals’ will be among the key cargo types in terms of attractiveness and ports must align their capabilities to leverage this opportunity.

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Logistics
The Logistics Practice at Tata Strategic has in-depth understanding of Indian Logistics Sector having have experience in conducting several in-depth market studies and growth strategies for clients in the logistics space. We have also assisted large corporates and MNCs in setting up their distribution network, overhauling their existing distribution networks, logistics cost optimization and inventory optimization.

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