

Middle East to India Deepwater Oil Pipeline – Preliminary Feasibility Statement

Introduction

India imports approximately 85% of its total crude oil needs, consuming roughly 5.5 million barrels per day (bpd). It is the world's third-largest oil importer. Until the recent conflict India imported approximately 45% of its oil and 62% of its LNG through the Straits of Hormuz from GCC countries (Iraq, Saudi Arabia, UAE, Kuwait, Qatar) according to EIA Country Analysis Brief Feb 2025.

The recent closure of the Strait of Hormuz has highlighted India's exposure to energy-supply disruption arising from conflict in the Middle East. In response, South Asia Gas Enterprise Pvt Ltd (SAGE) is investigating the feasibility of supplying crude oil to India via a pipeline from Fujairah, UAE, to the state of Gujarat. Fujairah is located on the Gulf of Oman, outside the Strait of Hormuz, and is already connected by an overland pipeline to UAE oil fields in the Persian Gulf, thereby bypassing the Strait. Gujarat hosts major oil import and refining infrastructure at Jamnagar, Sikka and Vadinar.

Project Overview

A preliminary assessment has been undertaken by Peritus International to evaluate the technical feasibility of transporting crude oil directly from Fujairah, UAE, to Gujarat, India, via a deep sea pipeline route, 1600km long across the Arabian Sea. Such a pipeline would reach a maximum water depth of 3,500 m. The work undertaken by Peritus builds on the detailed work already undertaken for SAGE on a deepwater gas pipeline (MEIDP) along a similar route. The study considered whether any major technical constraints would prevent such a pipeline from being developed and what the potential throughput could be if the pipeline was technically feasible. SAGE has asked Peritus to consider throughputs from 10Mtpa to 20Mtpa.

The key drivers to the technical feasibility of a long distance deepwater oil pipeline are:

- Length
- Proposed product (type of Oil) being transported
- Diameter of the pipeline
- Design pressure
- Installability of the pipeline

Having performed a preliminary overview the study focused on two key areas:

1. Whether current pumping technology, together with crude grades available in UAE and nearby GCC countries, can achieve the pressure and throughput required for a workable solution.
2. What sizes of pipeline (Outside Diameter and Wall Thickness) can be installed using the current global fleet of large-diameter rigid pipelay vessels.

Oil Type

The UAE produces a range of crude oil blends, from medium-sour to light-sweet. Typical API gravities include approximately 40.0° for **Murban**, 33.9° for **Upper Zakum**, 30.2° to 33.0° for **Dubai Crude**, and 37.0° to 40.0° for **Umm Lulu** and **Das Blend**, depending on the final mix. For

this study, the transported crude oil has therefore been assumed to have an API gravity between 30.2° and 40.0°.

Pump Capability, flowrate and pressure

A review of the pump supplier market has shown that there are at least three standard pumps that have pumps capable of a maximum delivery pressure of 160 barg and can achieve the throughput volumes required.

Starting with a minimum required throughput of 10 million tonnes of oil per year (equivalent to approximately 200,000 barrels per day) and using the range of API oil gravities anticipated from UAE it was determined that a minimum ID pipe of 32-inch to achieve an nominal arrival pressure of 20 bar for the 1600km route length.

Installation and Wall thickness

Based on the Middle East to India deepwater gas pipeline (MEIDP) and discussions with linepipe manufacturers it was known that for an empty collapse resistant pipeline, a maximum achievable diameter and wall thickness is 24-inch ID and 40.5mm wall thickness. As the flow assurance has dictated a pipe internal diameter in excess of 32-inch is required a normal pipeline laid in an empty condition will not be able to deliver sufficient oil. On this basis a pipeline installed in a flooded condition has been considered. This flooded pipelay negates the impact of external pressure and collapse is less likely to be the governing thickness. A range of diameters and wall thicknesses consistent with the required design pressure were determined and these then investigated for a flooded pipelay to determine the size of pipeline that could be installed based on the available S-lay and J-lay vessels with a top tension equal to or in excess of 2,000 tonnes.

Conclusion

As a result of the preliminary studies performed, a 36-inch internal diameter pipeline with an approximate wall thickness of 31 mm appears to provide a technically viable configuration, capable of transporting approximately 16.5 million tonnes per year of sweet stabilised crude oil from Fujairah, UAE, to India. 16.5 million tonnes per year equates to approximately five VLCC's per month.

These findings remain preliminary and should be subject to further engineering, installation, hydraulic, constructability, and commercial assessment before a robust development concept can be confirmed.

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