



# Resources

# Hydrocarbons & Chemicals

## Key Sectors

Hydrocarbons

Oil & Gas, refineries, petrochemicals, LNG, terminals and tankages

Speciality  
Chemical &  
Fertilisers

Chemicals, speciality chemicals, fertilisers

FMCG  
& Industrial  
Projects

FMCG & Pharmaceuticals, paints, cement, pulp & paper, tyres, glass, fibre optics

Annuity-based  
businesses

Exclusive services through Dedicated Engineering Centres for international clients  
3D-4D digital solutions, IIoT, remote monitoring and value engineering solutions



## Quick Facts

**Africa's largest**  
fertiliser plant

Ethiopia's first  
**PVC Plant**

Asia's largest  
paint manufacturing  
facility – **150,000 &  
300,000 klpa**

First Bank Note Rolling  
Paper Mill in India  
for **Reserve Bank of India**

Established the first  
Dedicated Engineering Centre  
to serve as an alliance partner  
to a **large petrochemical**  
major in Saudi Arabia

# Services

## Dedicated Engineering Centres

Tata Consulting Engineers' Hydrocarbons & Chemicals Business Unit (HCBU) provides services related to both client's Capex and Opex spends. The HCBU provides unique services through Dedicated Engineering Centres (DEC).

The DEC service model works as an extended engineering arm of the partner, in harmony with the partner's ecosystem with aligned work processes.

DEC delivery method is managed through milestone delivery and project progress. Constructibility decisions are enabled in simulated 3D-5D platform.



### DEC Model: Benefits

- Workforce flexibility and resource optimisation
- Agility for ramp ups and ramp downs
- Value additions through continuous learning and improvements of core team
- Dedicated delivery centre, professionals & systems tied to client ecosystems
- IPR protection through secure servers and access control
- State-of-the-art engineering suites to facilitate decision making right at the planning stage
- A combination of home team, satellite team and affiliate partner teams to ensure a closed loop environment

## Key Achievements

Project details	Value additions
Upgrade to new generation catalyst	Design alternatives resulting into CAPEX saving of 4.8 million USD and 26% footprint reduction; Reduced idling time from expected 17 days to 2 days
Retrofitting of control room building	Significant reduction in downtime/shutdown by using external reinforcement
Compressor turbine piping stress analysis	Rectification of misalignment of turbine and compressor piping leading to avoidance of complete replacement of the equipment in compliance with international standards



Detailed engineering for LPG import terminal at Mundra, Gujarat	Ongoing
Design engineering services for fibreglass plant	Ongoing
EPCM services for relocation & expansion of PVC Plant from Malaysia to India	Ongoing
EPCM services for paint project at Punjab	Ongoing
EPCM services for chloromethane plant at Dahej	Ongoing
Project consultancy services for manufacturing of currency and bank note paper	Bank Note Paper Mill (BNPM)
EPCM services for decorative paint project	Asian Paints Ltd.
Off road tyre manufacturing plant at Bhuj	Balkrishna Industries Ltd
EPCM services for off-site and utilities for NHT/CCR unit	Bharat Petroleum Corp
EPCM services for manufacturing of Nylon-6	Gujarat State Fertilizer
PMC services for PVC and caustic soda manufacturing plant	Dejenna Chemical Engineering PLC



## Case Study

### Innovative Approach for Process Selection and Tank Design to Maximise Storage Capacity with Limited Plot Area

#### Innovative Process Design

A regional leader in chemical manufacturing and trading was setting up a new hydrocarbon processing and storage terminal in Middle East. The client was facing significantly reduced economic viability due to the need of processing multiple feedstocks in separate facilities. TCE was engaged as a consultant to assess and suggest a cost effective way of dealing with such multiple feedstocks without multifold increase in CapEX which would render the project unviable.

**Solution:** After a thorough assessment and evaluation of all the available processes, TCE came up with opportunities where a variety of process mixes or solutions can be distilled to commercial grade valuable chemicals.

TCE conceptualised, optimised, simulated and designed a set of distillation columns to operate 4 sets of distinct and varied purification/separation processes using the same set of distillation columns, there-by

minimising CapEx and providing integration of the new facility with client's existing terminal.

Further to this, TCE proposed setting up a pilot plant to validate the process. Data from the pilot was used to fine tune the design of the commercial facility and scaled up by 30X and successfully executed.

#### Highlights:

1. First such installation for Client.
2. Entire basic engineering right from feasibility to process selection done in-house at TCE-HCBU.
3. 14 different separation processes evaluated to select the right set of 4 process combinations to ensure minimal TotEx, commercial advantage and ease of operations.
4. Designed the operation of the columns on a campaign basis to ensure smooth switch over from one process to another, with minimal contamination and interruption to terminal.
5. Highly optimised process block layout to minimise foot print.



## Optimised Tank Design for Maximum Storage

The plot area was very small (220 X 130 = 30000 sq. m) and the requirement was to maximise the storage capacity of the terminal by installing 30 tanks of various diameters along with other facilities. The conventional internal floating roof would result in a loss of around 1 to 1.5 m height of tank and hence reduced storage capacity.

**Solution:** By suggesting Aluminium internal floating roofs the height of the roof would be reduced to 350 mm from 500 mm. Through this value addition, the net increase in the storage volume is around 6000 m<sup>3</sup>, which is equivalent to one tank of 17 m dia X 27 m ht.

Intangible benefits like periodic painting can be avoided for the floating and dome roofs can be avoided. Aluminium has excellent

heat reflection capabilities which reduces the evaporation of the product stored and hence lowers emission losses. The storage tank heights normally in the region were 25 m max. All the 30 tanks were designed with height of 27 m instead of usual 25 m height. With this the volume is further enhanced.

### Following are the benefits due to the value addition proposed:

1. Ground improvement cost savings
2. Foundation cost savings
3. Tank material and labour cost
4. Aluminium floating roof and dome roof cost and painting cost

## Key Differentiators

- ▶ Value Chain Integration; Power-Process-Material Handling-Utilities Remote Monitoring
- ▶ Schedule Optimisation: 3D/4D Simulation
- ▶ Value Engineering: Cost Optimisation, Design Innovations
- ▶ Concept to Commissioning: All services provided in house
- ▶ Licensor Technology: Neutral
- ▶ Proven Expertise, Deep Knowledge – Wide spectrum of projects
- ▶ Tata Ethics & Value System confidentiality, and IP protection
- ▶ Best in class engineers: Multi-disciplinary talent from top Institutes

### Contact

Email: [tceconnect@tce.co.in](mailto:tceconnect@tce.co.in) | Website: [www.tce.co.in](http://www.tce.co.in)