

Liquid Fuel Storage (LFS) Automated Pre-Feasibility (FEL-1) Software



Minimum input

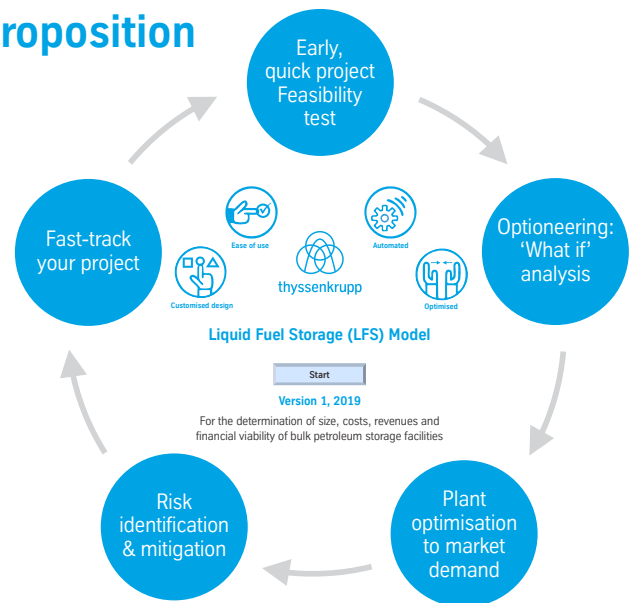
Market demand

- Method (pipeline; vessel; road; rail)
- Volume (m³) per annum
- Expected annual market growth
- Design horizon in years

Product replenishment

- Method (pipeline; vessel; road; rail)

Value proposition



Pre-feasibility (FEL-1) automation

Tracks	FEL-1 TIC ± 50%	FEL-2 TIC ± 30%	FEL-3 TIC ± 10%	EPC	OPERATION
Business & Operations	Business model Logistics study Plant optimisation Capex & Opex calculation Tank sizing Inbound sizing Outbound sizing Financial evaluation Supplier & take-off agreements Business case	Operation procedures NERSA application Capex calculation Opex calculation Economic evaluation Business plan	Economic evaluation Obtain debt Finance agreement Capex calculation Opex calculation Final business plan Regulator approval Record of decision FID	Establish business structures, logistics & systems Commissioning plan Training	Business execution IAM execution
Project execution	Geotechnical study Topographical study EIA start	Feasibility study	FEED EPC proposal IAM proposal	Detail engineering Procurement Construction	Plant optimisation

References: South African Based Storage

Detergents Alcohol



- Scope: EPC
- Completion: 2003
- Details: Tank farm of 15 storage tanks and transfer pumps

VCM Revamp (Vinyl Chloride Monomer)



- Scope: EPC
- Completion: 2004
- Details: EDC Double-walled tank, transfer pump and vent recovery

TNPE (Tar Naphtha Phenolic Extraction)



- Scope: EPC
- Completion: 2005
- Details: Phenols storage and underground tanks

3% Benzene Reduction



- Scope: EPCM
- Completion: 2011
- Details: Largest double-wall tanks in South Africa (40m x 18m dia.)

Water Recovery Growth



- Scope: EPCM
- Completion: 2014
- Details: Construction of tanks based on bolted panel design

New Multi-Purpose Pipeline (TM1 & TM2)



- Scope: Engineering services
- Completion: 2015 (e)
- Details: Engineering of tankage, pigging and pumps

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