KAVIN - PROFILE

OUR VISION

Emerge as a global Leader in energy through Innovative technology and Techniques with commitment to deliver in Time, Quality, Safety and Cost Effective Solutions to the satisfaction of our customers, by Organisational Excellence.

OUR MISSION

Be innovative; enjoy leadership and freedom; be committed to customer satisfaction and success. Build, develop, motivate and direct all resources towards this.

OUR COMMITMENT TO EXCELLENCE

KAVIN is committed to meeting and exceeding our client's expectations through the application of proven quality principles at all levels of service we provide and ensuring customer/client care is given the highest possible priority.

Innovation has always been part of our business. Our resources will give us the capabilities for long term and innovative technology development to meet the industry's current and future challenges.

The KAVIN brand values guide and reflect our behaviour at work and unify us as one global team. Our values are a testament to the culture we live and work by!

We

- **Benchmark - to learn from superior role models**
- **Foster - innovation with emphasis on value addition**
- **Thrive - upon constant Knowledge updating, as a learning organisation**
- **Nurture - the essence of Customer Relationship and bonding**

with

- **Integrity and Trust as fundamental to functioning**
- **Passion in pursuit of excellence**
- **Quality as a way of life**
- **Collaboration in synergy through cross-functional Team effort**
- **Sense of ownership in what we do**

KAVIN ENGINEERING AND SERVICES PRIVATE LIMITED

ENGINEERING SERVICES OFFERED & CREDENTIALS

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KAVIN ENGINEERING AND SERVICES PRIVATE LIMITED

KAVIN's SERVICE OFFERINGS

KAVIN has been providing innovative and quality **engineering & design, and project management services** for major oil and gas projects, across the globe, for more than 11 years. Our work has encompassed a broad range of projects, covering the entire spectrum of Offshore and Onshore Oil & Gas processing systems in the upstream market. Our team of engineering professionals has worked on a wide range of projects. Regardless of scale or complexity, we have developed excellence in capability to support our client's/customers' projects using tried and tested effective tools and systems. KAVIN's team of experienced engineers executes complex and challenging projects. The individual and collective project and technical expertise of its engineering experts allows KAVIN to deliver appropriate, cost-effective solutions to clients.

We provide a full range of services including offshore & onshore engineering, basic/detail engineering design, drafting and as-built drawings including 3D, front-end-engineering design, conceptual design/feasibility studies, support during fabrication/installation, start-up and commissioning, logistics planning and simulation, project management and engineering consultancy services.

KAVIN employs a totally diverse team of dynamic engineers covering all engineering disciplines, together with required computer hardware, software and peripherals. KAVIN's engineering expertise ranges from traditional disciplines, such as civil, electrical, mechanical, instrumentation. piping, process and structural engineering to advance specialties including simulation, and the use of interactive 2D, 3D modeling for engineering analysis and production of designs .

I. ENGINEERING SERVICES

BROWNFIELD, GREENFIELD (OFFSHORE AND ONSHORE) PROJECT ENGINEERING

KAVIN's range of project engineering services includes:

- Conceptual, FEED, Basic, Detailed Engineering
- Brownfield Facilities Upgrades and De-bottlenecking Studies
- Greenfield Facilities Developments
- Offshore Fixed and Floating Facilities and FPSO Developments
- Project HAZOP and HAZID Design Reviews
- Process Equipments and Systems
- Local & Centralized Instrumentation and Control Systems
- Power Generation & Distribution Systems
- Asset Integrity Management Services
- Project Cost Estimate Services
- Project Management Consultancy Services

ENGINEERING

Conceptual / Feasibility Studies ; Pre-Bid Engineering; Front End Engineering Design (FEED); Basic Engineering ; Detailed Engineering ; Process Optimization Studies; Process Design Reviews; FPSO Topsides Design ; FPSO Motion Analysis ; Site Assistance; Pre-commissioning and Commissioning ; Operation Support ; Operators' Training (Field, Class Room and DCS) ; Operation and Maintenance Manual ; Trouble

Shooting /Optimization/Debottlenecking Solutions ; Reliability & Availability Study; Corrosion Study/Evaluation; Plant Performance Review; HAZOP/HAZID/SIL

SYSTEMS & PACKAGES

Separation (API 16 to API 54) ; Gas Compression ; Gas Dehydration and TEG Regeneration ; MEG Injection and Regeneration ; Produced Water Treatment ; Gas Sweetening (Amine Unit) ; Sulphur Recovery Units ; CO2 Removal ; Dew Point Control ; N2 Generation ; Water Injection ; Chemical Injection ; Corrosion Study; E-house ; Diluents Recovery System; Tank Farms; Power Plant/Generation

We routinely design compact, modular facilities/units to meet restrictive size and weight limits and produce costs.

- **FIELD DEVELOPMENT STUDY - Existing Facilities Review, New Facilities Options, Options Evaluation, Capacity and Adequacy Check, Tie-in Identification, Conceptual Design**
- **ONSHORE PROCESSING FACILITIES - Process Facilities Design, Tank Farm Design, Review/Upgrade of Existing Plant, Onshore LPG/LNG Plants Design**
- **ONSHORE PIPELINE - Pipelines Engineering and Construction Management, Inter-field and Cross-country Onshore Piping, Pipeline Replacement Review, New Pipeline Design, Review/Upgrade of Existing Pipeline , Corrosion Evaluation, Pig Launchers/Receivers, Pigging Study**
- **OFFSHORE FACILITIES - Well Head Platforms, Central Processing Facilities, Risers, Fixed Platform and Floating Facilities, Revamp/Upgrade – Existing Facilities, Site Modifications/Review**
- **FPSO/FSO/FPS/TLP - Complete Topside Design, Process Facilities Design considering FPSO Motions, Topside Facilities Layout considering safety, hazards and process criteria, Modules and Packages for Floating Units, Technology/Design Solutions for FLNG**
- **MODULES/PACKAGES - Modular concept solutions for Onshore, Offshore and FPSO Applications, Module – In place, Transport, Lifting and Load out Analysis, Space and Weight conscious Design**
- **SPECIAL STUDIES - Reliability and Availability Study, Corrosion Evaluation and Material Selection Study, Flare Network Analysis, Deluge Hydronics Calculation, Asset Integrity Management Studies, Plant Performance Study and Energy Audits**

II. PROJECT MANAGEMENT & CONSULTING

Project Management is one of KAVIN's competencies and key to the success of any project. We offer a comprehensive set of project management services for Oil & Gas Industry, including:

- Scoping, definition and estimation
- Cost and Schedule management
- Reporting
- Sub-contractor management

Our services range from providing project managers to taking full responsibility for managing client's work. What makes KAVIN's project managers different is the fact that they are well experienced in delivering projects in the oil & gas industry.

KAVIN's EXPERTISE IN ENGINEERING SOLUTIONS FOR OIL & GAS SECTOR

Engineering being vital enabling function for EPC, KAVIN provides comprehensive engineering solutions for Upstream Oil & Gas Sector. We optimize the sequencing of engineering deliverables to meet project priorities for procurement, fabrication and commissioning. Adhering to best practice in areas such as process optimization; and piping, electrical and structural design, we help to deliver safe and operable topsides that minimize capital and operating expenditures. One of KAVIN's key differentiator (also a strong differentiator) is our **Modular Concept Solutions**. Modular systems simplify overall shipyard construction and reduce integration cost and schedule. Modules can be independently fabricated, tested and delivered to the shipyard as complete packages ready for integration, commissioning and start-up. Other design metrics taken into consideration during our engineering solutions are cost effectiveness, schedule improvement, flexibility, interchangeability, scalability, expandability, quality control and safety.

Some of our Flagship Engineering Projects in Well Head/Process Platforms include:

- Complete Design & Detailed Engineering of B193 5 WELLHEAD PLATFORMS - for Nauvata/Sime Darby/ ONGC (Operator).
- De-Bottlenecking Study of BPA-BPB Process Platforms for ONGC, India
- Gas Dehydration & TEG Regeneration System for E11 Hub Project – F13 – for VME Process/ SHELL
- Conceptual Design of Seawater Treatment & Deaeration & FEED for Gas Processing Facilities for Sumandak Process Platform – for RNZ/Petronas Carigali
- Methonal & Chemical Injection Packages for Okume & Oveng TLP Project – for VME Process/MODEC
- Sand Cleaning System for TML Bunga Raya-A(MR-A) Platform – for NOV/Talisman
- Condensate & Water Strainer for RAS Gas Offshore Expansion Project Phase 2 – for J Ray McDermott/RAS Gas
- Gas Dehydration & TEG Package for Salman Oil & Gas Field Development Project – for GPSS/PEDCO
- Gas Dehydration & TEG Package for Rong Doi Tay Gas Field Development – for VME/Korean National Oil
- Structural Analysis of SUN Platform for HOEC, India

Some of our Flagship Engineering Projects in FPSO Topsides include:

- Complete Process Topside Facilities of Brotojoyo FPSO for VME Process / Petrochina
- Complete Process Topside Facilities of Apache's Ningaloo Vision FPSO for VME Process / Apache Corporation
- Complete Process Topside Facilities of Cidade De Niteroi MV18 FPSO for Modec / Petrobras
- Complete Process Topside Facilities of TSJOC FPSO for Modec / Troung Son
- Feed for Complete FPSO Topside Facilities of Petrobras P-57 Oil FPSO for Modec / Petrobras
- Complete Process Topside and Project Management of PUO FPSO for BLT / Kangean Energy
- Complete Process Topside of TSB FPSO for VME/Kangean Energy/BW Offshore
- FEED for Takunta FPSO for Schlumberger/PEMEX
- Complete Topside Modification Engineering of SAGARLAKSHMI MOPU (Mobile Production Unit) for Pipavav/ONGC, India

Some of our Flagship Onshore Engineering Projects:

- FEED & Detailed Engineering of Onshore Processing Facilities – Block 51 BAK Processing Facilities, Yemen for GPS
- FEED for Gas Processing Facility – Halewah Gas Plant Project Block 5, Yemen for MIS/ Hunt Oil
- FEED & Detailed Engineering – Saleh Phase 1 & 2 Facility Modification, Ras Al Khaima, UAE for RAK Gas
- De-Bottlenecking Study of Process Facilities & SBHT Lines – Hazira Plant, India for ONGC
- Detailed Engineering for Temporary Power Plant – Garraf Filed, Iraq for Synergestic generation, Sdn Bhd
- Process Design Verification of Processing Facilities – Lekhwair, Fahud & Yibal Fields, Yemen for Galfar Engineering & Contracting
- Consultancy Services for Elevated Flare System for ONGC, Rajahmundry and FGRC for ONGC Uran, India
- Basic Engineering, FEED and Project Management Consultancy Services for OIL India Ltd, for New Oil Collection Station, in Barekuri (Assam), India
- Asset Integrity Management Services for RAK Gas, for Plants/Fields at Bukha, BSP & Atlantis
- Plant Performance Study and Energy Audit of RAKGAS Plants/Fields at Bukha, BSP & Atlantis

Some of our Project Management & Consulting Projects:

- Basic Engineering, FEED and Project Management Consultancy Services for OIL India Ltd, for New Oil Collection Station, in Barekuri (Assam), India
- Consultancy Services for Elevated Flare System for ONGC, Rajahmundry and Flare Gas Recovery and Compression for ONGC Uran, India
- Asset Integrity Management Services for RAK Gas, for Plants/Fields at Bukha, BSP & Atlantis
- Plant Performance Study and Energy Audit of RAKGAS Plants/Fields at Bukha, BSP & Atlantis
- Project Management Services for Complete Process Topside Re-modification for BLT/Kangean Energy for the PUO FPSO, Indonesia

CASE STUDIES

PROJECT	Halewah Gas Plant Project Block - 5 Republic Of Yemen
DESCRIPTION	FEED Study of Halewah Gas Plant
CLIENT: MIS **(Maritime Industrial Services)** provides a broad range of products and services to the oil, gas and energy sector. MIS was established in Dubai, UAE in 1979.	**END CLIENT:** Hunt Oil is one of the largest privately held companies in the United States. Further, the areas of activity of the different Hunt companies include energy, real estate, investments, ranching and infrastructure.
LOCATION: Block 5, Republic of Yemen	**DURATION:** 4 months
DELIVERABLES • Design Basis - Halewah Gas Plant • PFD's & P&IDs • Process Sizing Calculations • Equipment layout • Piping GA • BOM -Piping, E&I & Structural • Datasheets- Equipments & Motors • Piping Speciality List • Manual valve summary • RFQs - Packages • Instrument Index • Electrical Equipment List • Electrical Load List	**PACKAGES** • Pig Receiver • Production Separator #1200 • Gas Dehydration System • TEG Regeneration System • Regeneration Gas Dehydration System • Molecular Sieve Gas Dehydration System • Mercury Removal Unit • Hot Oil System • Flare System • Drain System • Hot Oil Drain System • Glycol Drain System • Mol. Sieve Gas Regeneration System • Cryogenic System (De-Ethanizer) • Debutanizer System • Injection Gas Compressor System • Fuel Gas System • Instrument Air System
FEED includes process design and specifications for a new separator, a Gas dehydration system, a Mercury removal system, and an efficient Turbo-expander cryogenic gas plant for the recovery of natural gas liquids (NGL) which will be further processed in a Debutanizer unit into LPG and stabilized condensate	

CASE STUDIES

PROJECT	05 Well Head Platform for B-193 Project
DESCRIPTION	Design and Detail Engineering of B23A-A, B28A-A, B172-A, B178-A and B179-A (5 Nos.) Wellhead Platforms

CLIENT: Sime Darby Engineering Sdn Bhd, a subsidiary of Sime Darby Berhad, Malaysia's leading multinational and one of the largest conglomerates in South east Asia	**END CLIENT**: Oil and Natural Gas Corporation Limited (ONGC India) is one of the leading Oil and Gas Exploration and Production company. It ranks as the 2nd biggest E&P company (and 1st in terms of profits), as per the Platts Energy Business Technology (EBT) Survey 2004.
LOCATION: Heera- Panna-Bassein, Offshore, Bombay	**DURATION**: 6 months

DELIVERABLES

Process Simulation
PFD/HMBT
P&IDS
Process Calculation
Process Description
Data Sheet - Equipments & Instruments
Equipment Layout
Piping GA/Isometrics/Supports
Piping Stress Analysis
Structural Analysis & Design
Structural Fabrication Drawings
Electrical Design/Drawings/Datasheets
Instrument Design
Instrumentation Drawings/Datasheets
Commissioning Procedures
Operation & Maintenance Manual

DESIGN DATA/SPECIFICATIONS:

Total Fluid Capacity - 33,000 BFPD
Oil Processing Capacity - 15,000 BOPD
Produced Water Capacity - 18,000 BWPD
Design Pressure – 270 psig
Design Temperature – 65.55°
Storage Capacity - 400,000 BOPD

FACILITIES/MODULES DESIGNED

Complete Topside comprising of the following process facilities;

- Separation (3 Stage)
- Produced Water Treatment
- Condensate Stabilization System
- HP / LP Flare System
- Chemical Injection System

The Design of the 5 Wellhead Platforms was in strict compliance to prescribed standards. Development facility comprised of a total of five (5) no's wellhead platforms and Pre-installed risers for all 5 Wellhead platforms.

CASE STUDIES

PROJECT	Process Topside Design Engineering for TSB FPSO
DESCRIPTION	To provide design and engineering services for Complete FPSO Process topside Facilities for TSB Field Development

CLIENT: VME Process, a leading supplier of Process Systems for the Oil and Gas Industry, with reputable turnkey capabilitiues in Design, Engineerinbg, Manufacturing and Construction.	**END CLIENT:** **BW Offshore** is a leading global provider of floating production services to the oil and gas industry. The company is the world's second largest contractor with a fleet of 14 FPSOs and two FSOs. **Kangean Energy**, Indonesia is one of the leading Hydro-Carbon producer operating over 5 blocks in East Java.
LOCATION: Terang Sirasun Batur (TSB), Offshore Indonesia	**DURATION:** 8 months

DELIVERABLES

Process Simulation
PFD/HMBT
P&IDS
Process Calculation
Process Description
Data Sheet - Equipments & Instruments
Equipment Layout
Piping GA/Isometrics/Supports
Piping Stress Analysis
Structural Analysis & Design
Structural Fabrication Drawings
Electrical Design/Drawings/Datasheets
Instrument Design
Instrumentation Drawings/Datasheets
Commissioning Procedures
Operation & Maintenance Manual

DESIGN DATA/SPECIFICATIONS:

Total Fluid Capacity - 340 MMSCFD
Condensate Processing Capacity - 2,000 BCPD

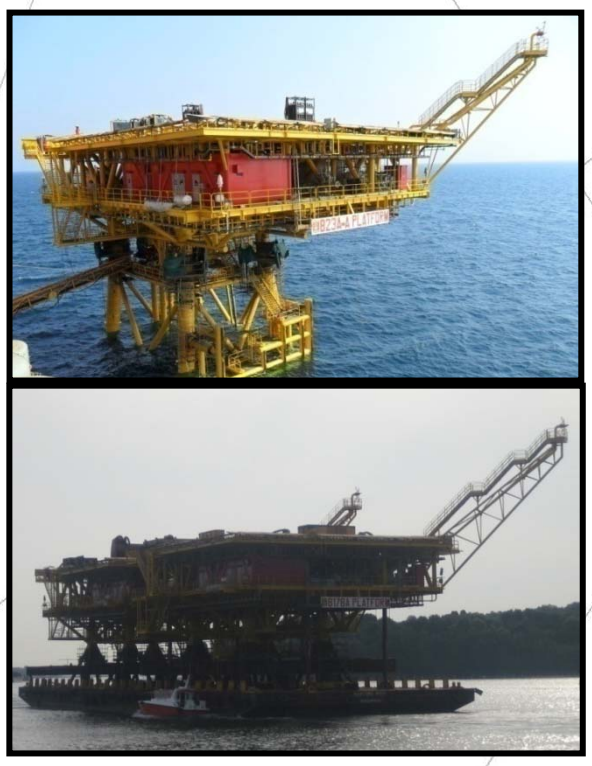
FACILITIES / MODULES DESIGNED

- Inlet Manifold Module
- Gas Separation Module
- LP Gas Compressor Module
- HP Gas Compressor Module
- Gas Dehydration and Fuel Gas Module
- Utility Module
- Chemical Injection Module
- Flare & Drain Module

The Design of the FPSO Topside was in strict compliance to prescribed standards. Kavin provided support during fabrication and conversion at the shipyard.

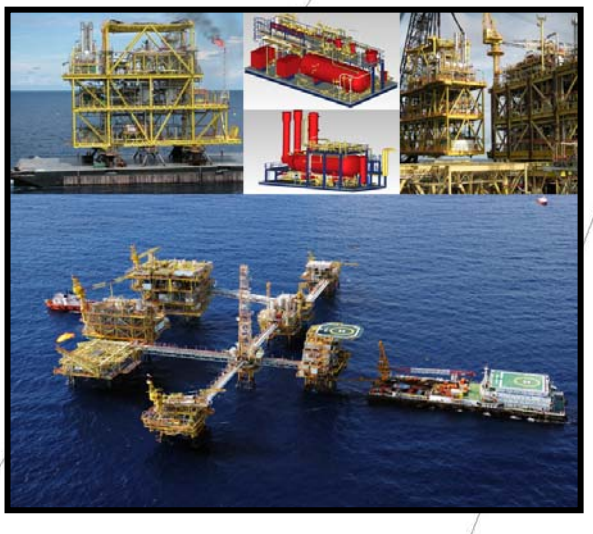
PHOTO GALLERY OF PROJECTS EXECUTED BY KAVIN

Platform Project:

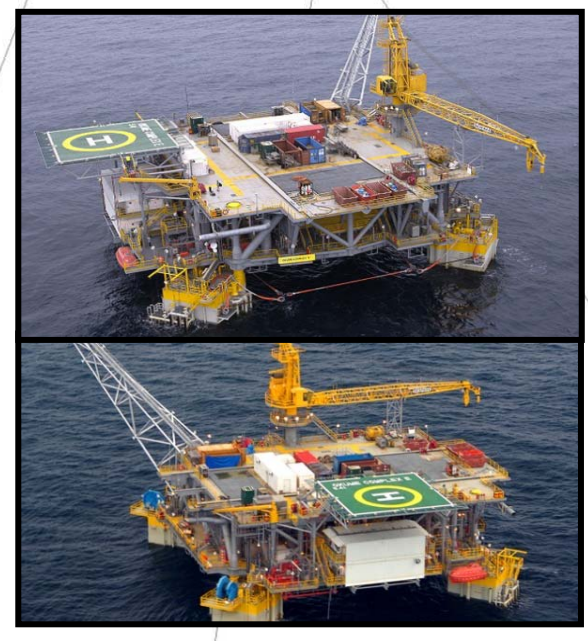


Detail Engineering for ONGC B-193 Well Head Platforms (5 Nos.)

De-Bottlenecking Study of BPA & BPB Platforms at ONGC, Hazira



Detail Engineering for Shell F-13 Gas Dehydration and TEG Regeneration Module



Detail Engineering for Chemical & Methanol Injection Packages for Okume & Oveng TLP Platforms

FPSO Projects:

Complete Process Topside Detail Engineering for TSB FPSO

Complete Process Topside Modification Engineering for PUO FPSO

Complete Process Topside Detail Engineering for Apache's Ningaloo Vision FPSO

Complete Process Topside Detail Engineering TSJOC FPSO

Onshore Projects

FEED & Detailed Engineering - Onshore Processing Facility – Block 51 BAK Processing Facilities, Yemen

FEED for Gas Processing Facility - Halewah Gas Plant Project Block - Republic Of Yemen

FEED & Detail Engineering - Saleh Phase 1 & 2 Facility Modification, Ras Al Khaimah

De-Bottlenecking Study of Process Facilities & SBHT Lines - Hazira Plant (India) for ONGC

To conclude:

Over the years we've built a world-class reputation for the design and supply of process systems for Onshore and Offshore projects, including marginal fields or challenging environments. We provide a total design and supply capability for process topsides, covering the complete lifecycle of a project from conceptual & FEED studies through detailed design to installation and commissioning.

KAVIN believes that the combination of challenging projects and changing times requires atypical program thinking and execution re-engineering. We are committed to the idea of "Strength through Shared Resources" which we believe is the way to achieve viable solutions that today's oil and gas community requires. KAVIN specializes in multi-facility program developments for our entire core services offered. This promotes cost-effective and fit-for-purpose design solutions that meet our clients' objectives and expectations.

At KAVIN, we offer quality, experience, and affordability. Our team offers deep engineering domain experience and leverages advanced technologies for greater accuracy, performance and efficiency. We have a proven track record of success and we offer proven expertise in design & engineering small to large and complex projects with great attention to detail through each phase of engineering.

Our commitment is to be your BEST overall value in an Engineering services provider

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