

# **SATTVA EngiTech Pvt Ltd**

Assured quality services for Engineering and Technological needs

# SATTVA ENGITECH PORTFOLIO

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# SAFETY MOMENT



# DID YOU KNOW

# HEARING PROTECTION BLOCKS NOISE FROM REACHING YOUR EARDRUM BY FORMING AN AIRTIGHT SEAL.

- Do not wear hats underneath muff-style hearing protectors.
- Foam- and insert-style hearing protectors must be fully inserted into the hearing canal to be effective.
- Extremely noisy work environments may require wearing both foam-style plugs and a muff-style hearing protector.



# Introduction



✓ SATTVA EngiTech is a private limited company established in Aug. 2016 and since then is working towards achieving excellence in Engineering and Technology Services.

- ✓ We follow the 3 C's and 2 I's cardinal rules
  - ✓ Create: Build relationships along with honesty, transparency, and business ethics.
  - ✓ Care: Our services are customer-focused and we greatly respect the trust that they have in us.
  - ✓ Conserve: We provide quality services to our esteemed customers.
  - ✓ Integrity & Innovation

# INTRODUCTION



# **Competent People**

- Most of the experts are from premium institutes like IITs, NITs
- Experts have worked with major Clients across the globe
  - Petronas, ONGC, IOCL, SABIC, SHELL, Dubai Petroleum, BPCL, HPCL, etc.

### **World Class Tools for FA and Simulation**

- ASPEN Suite



Schlumberger (with use of DELFI)





# **ACHIEVEMENTS**

**SATTVA EngiTech Pvt** Ltd has been identified as one of **India's Top** 10 Process Safety Management companies for 2022 by **Industry Outlook** magazine.



### SATTVA ENGITECH

AS ONE OF THE

PROCESS SAFETY
MANAGEMENT COMPANIES

2022

in acknowledgement of its unwavering focus and dedication to achieve excellence in quality and delivery in this field.



Sodhakar Singh Managing Editor Industry Outlook



# **ACHIEVEMENTS**

SATTVA **EngiTech Pvt** Ltd has also been recognized as one of The Top 10 Most **Fastest Growing** Companies to watch by Inner Review magazine.



is recognized by THE INNER REVIEW Magazine in



An annual listing of "The 10 Most Fastest Growing Companies To Watch" that are leading by example and setting new standards in the field of Business





Accelerating Businesses

# **ACHIEVEMENTS**

SATTVA **EngiTech Pvt** Ltd has been identified as one of THE **COMPANIES IN-**FOCUS by The **Global Hues** magazine.



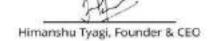


is awarded to



In appreciation of the outstanding performance and enduring commitment for business excellence

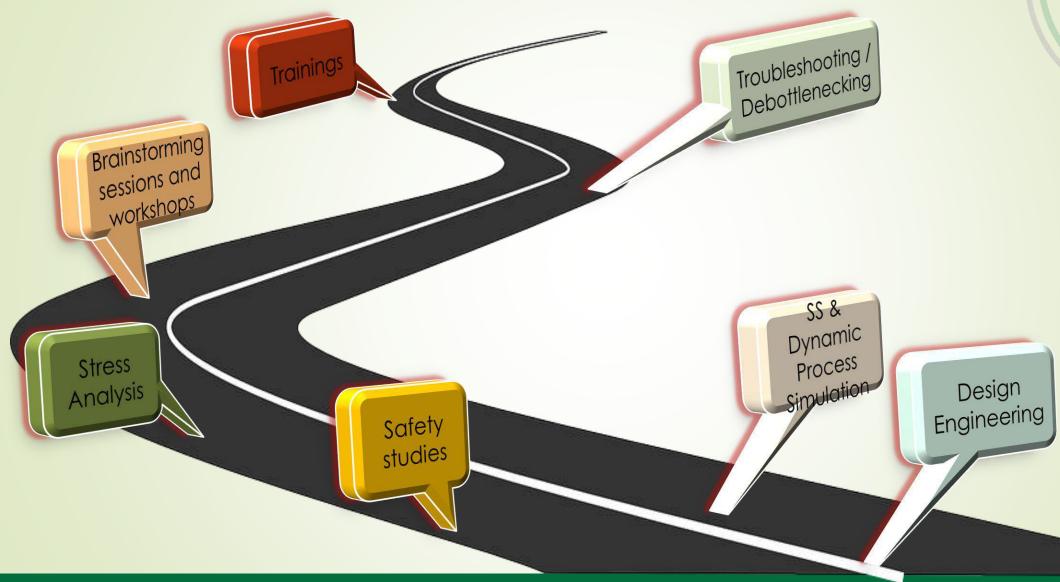
June 2022 DATE





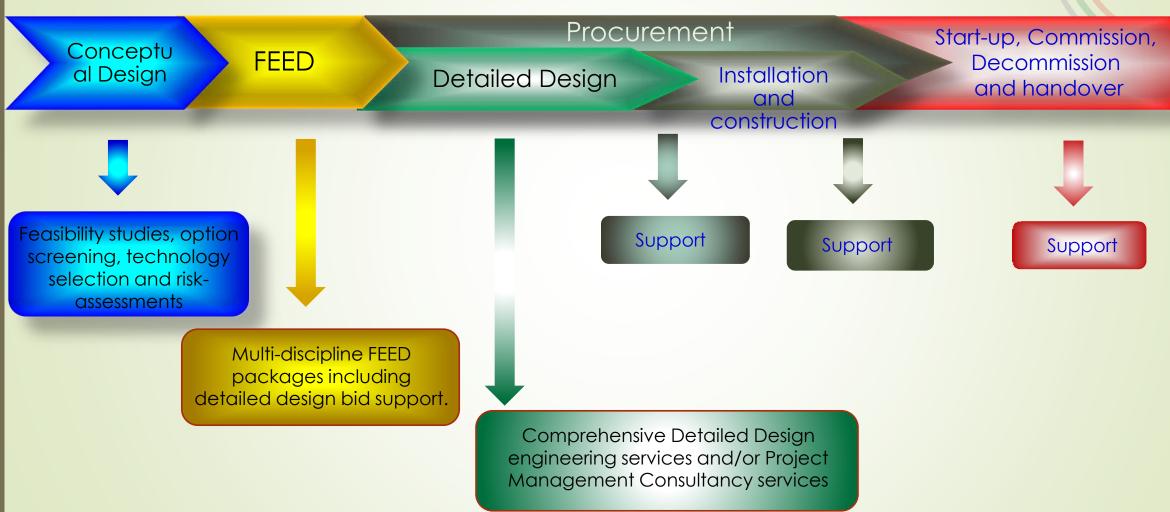
# **KEY SERVICES**





# ENGINEERING SERVICES





# Troubleshooting/ Debottlenecking



Benchmarking and Root cause analysis

Performance monitoring of Plant or unit operation

Site verification and collecting site data

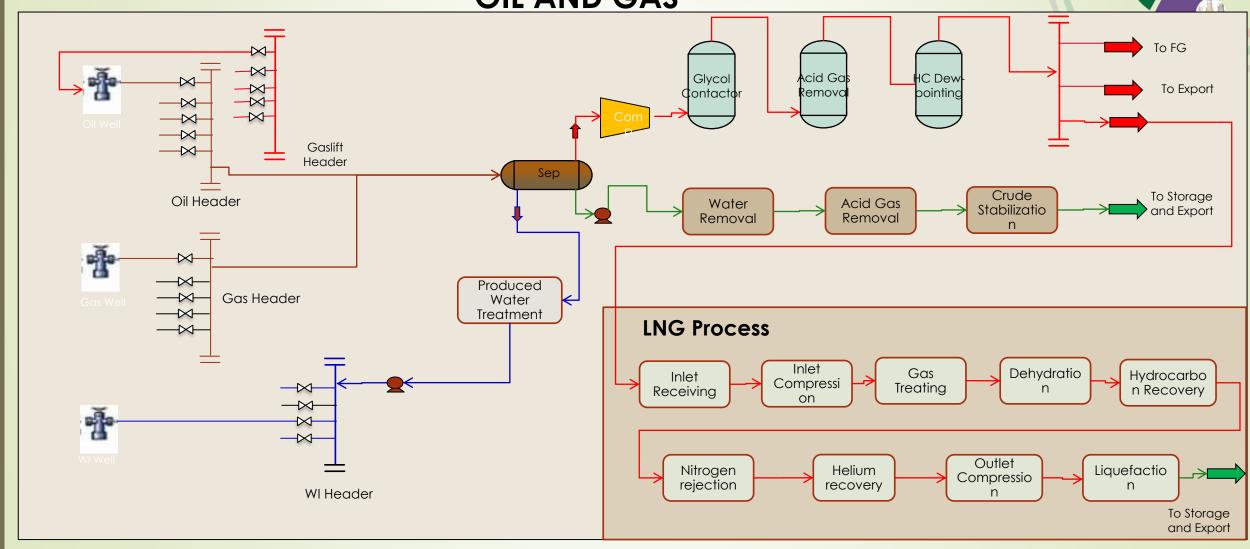
Design data acquisition and reverification



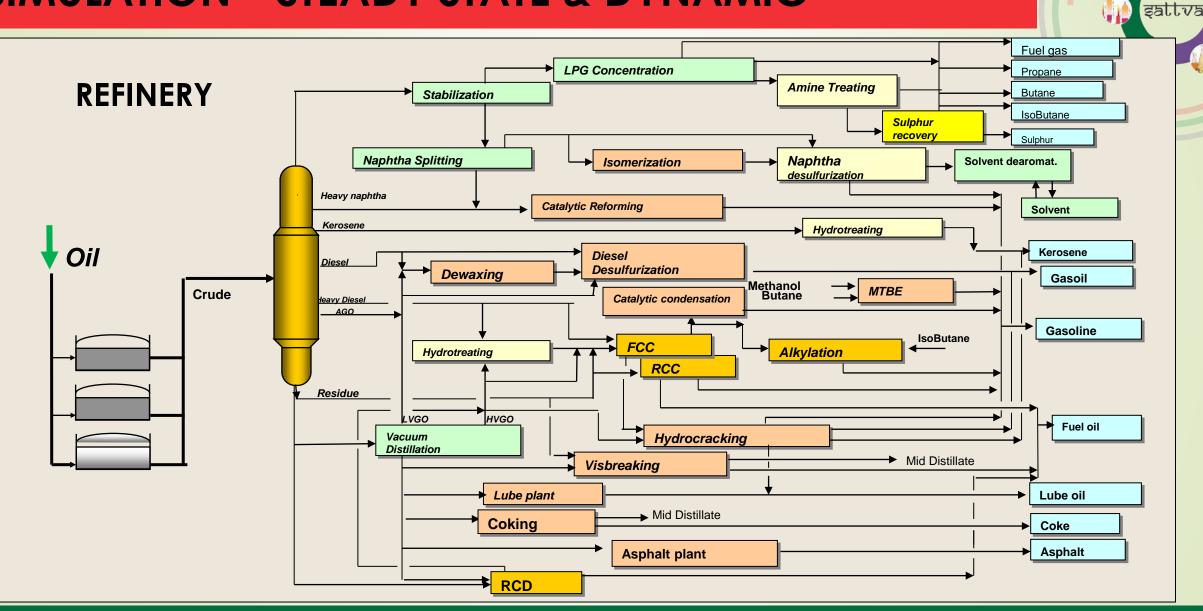
# SIMULATION - STEADY STATE & DYNAMIC







# SIMULATION - STEADY STATE & DYNAMIC



# SIMULATION SERVICES





### Kick Off Meeting

- Markup of P&ID to freeze scope of work
- Identify Field Operated Devices
- Identify Custom Malfunctions and Instructor Variables along with the Expected Response
- Identify their ranges and applicability
- Discussion On HMB



- Data collection based on Data Register
- Analysis Of the Data





### **Functional Design Specification**

- Definition of the extent of scope of supply
- Description of the functions and facilities of the Models to be delivered
- Definition of the major aspects of the Model & Implementation Methodology

# SIMULATION SERVICES



# Dynamic simulation model developed for

Wellhead facility for Process Safety Time Study

Condensate Stabilizer debottleneck study

Compressor Anti-surge Design

Compressor Start-up case including HGBV

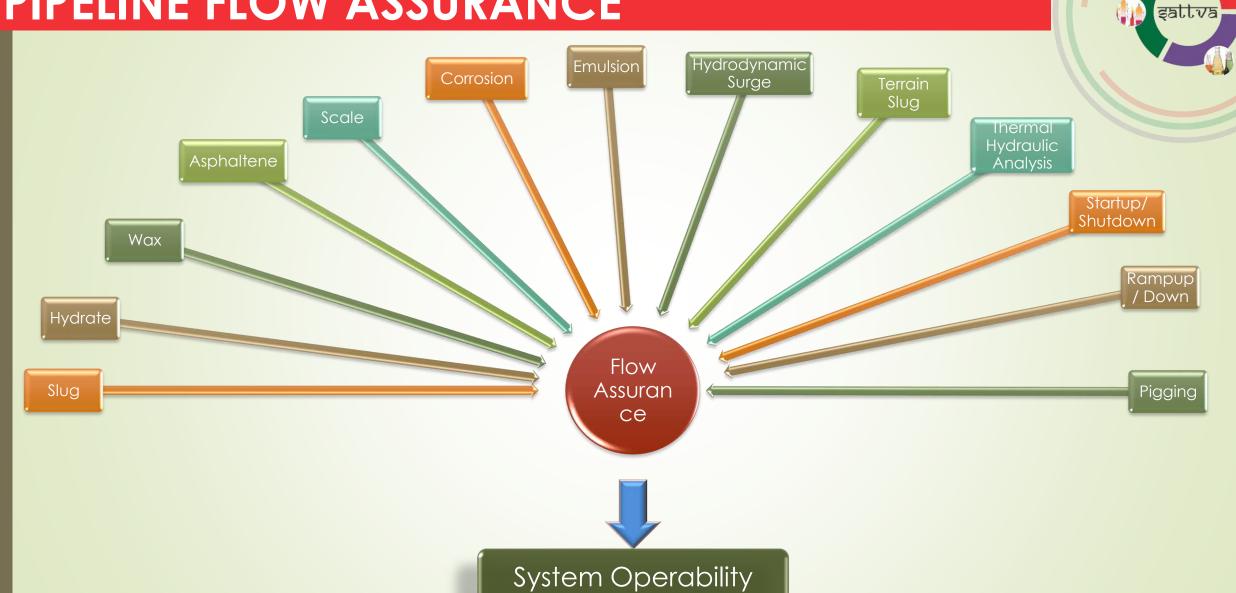
BT Fractionation

Cracking Furnaces, CGC

PAREX

Note: Collective projects of all team members

# PIPELINE FLOW ASSURANCE



# PIPELINE FLOW ASSURANCE



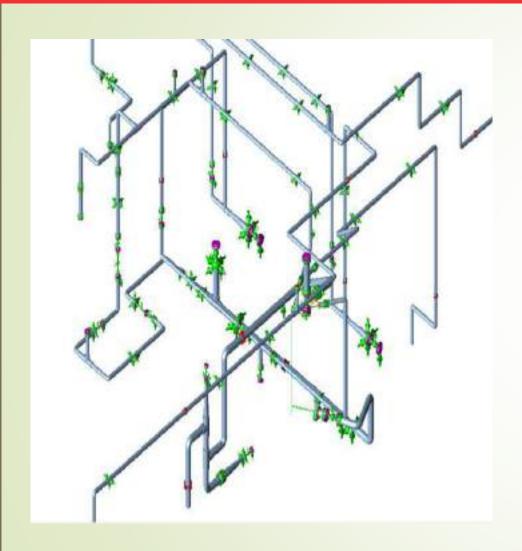
# Flow Assurance Projects Carried out



\* Study executed by team members as a part of other organization

# PIPING STRESS ANALYSIS & SUPPORT DESIGN





- ✓ Piping stress analysis to meet International and National code requirements.
- ✓ Troubleshooting of existing plant piping such as pump misalignments, vibration.
- ✓ Preparation of IBR approval packages.
- ✓ Design of pipe supports.
- ✓ Development of datasheet/ specifications of special supports such as spring hangers.

# SAFETY STUDIES





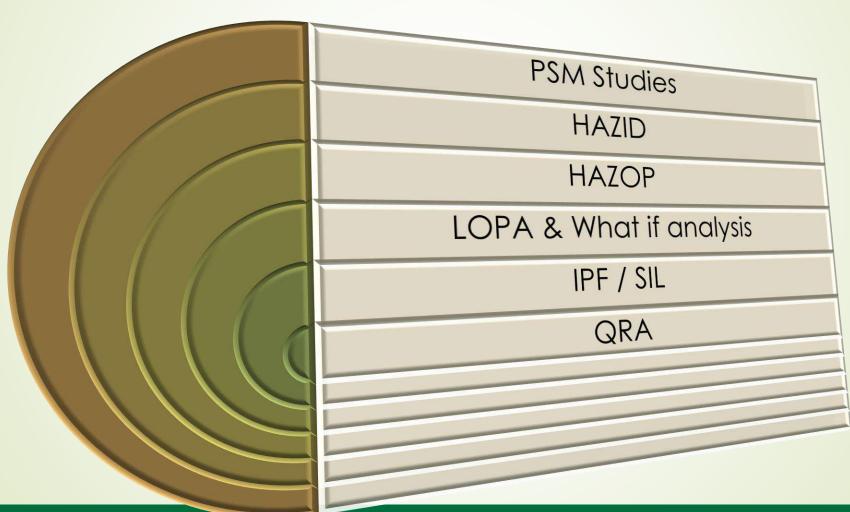


- Safeguarding philosophy
- Vent, flare network modelling
- Dispersion and radiations studies
- Surge analysis
- HAC drawings

# **BRAINSTORMING SESSIONS AND**

# WORKSHOPS





# **TRAININGS**



Industry specific
Troubleshooting Training

Process Simulation

Thermal design of Exchangers

Software

Flow Assurance Using Transient Simulator

Vent/Flare Network

Dispersion and Radiation Studies

# SOFTWARE CAPABILITIES

Process Simulation – Steady State & dynamic	
<ul><li>Aspen HYSYS</li><li>Aspen Plus</li></ul>	- UNISIM* - Symmetry
Piping	
- CAESAR-II*	- AUTOCAD
Heat Transfer	
- Aspen EDR	
Hydraulics – Steady State	
- PIPESIM - AFT Fathom+	<ul><li>Aspen Flare Analyser</li><li>Flaresim</li></ul>
Hydraulics – Dynamic	
- OLGA - AFT Impulse <sup>+</sup>	- PIPENET*
Other Software	
<ul> <li>Shell FRED*</li> <li>DNV Phast/Safeti+</li> </ul>	- PVTSIM* - Multi-Flash

# **INDUSTRIES**

Oil and Gas

Refineries

Petrochemicals

Polymer

Pharmaceuticals

Pipeline distribution networks

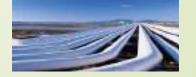






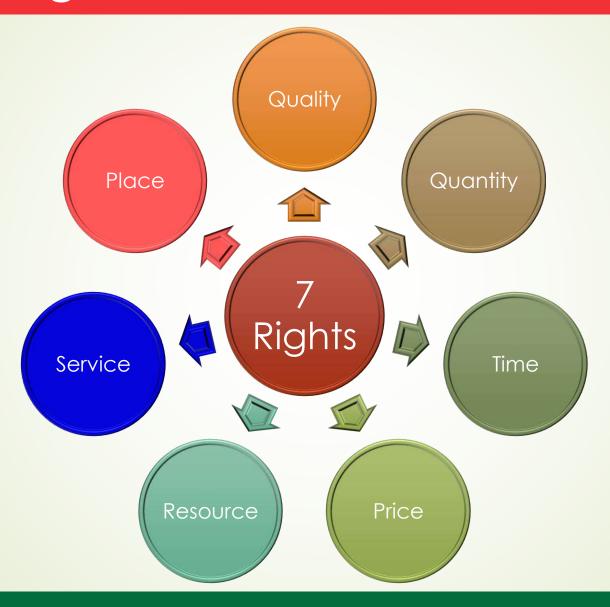






# WHY SATTVA EngiTech?









- Revamp
- Troubleshooting

Value Added Engineering

• Flow Assurance

Projects

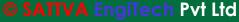
- Simulation
- Surge
- Heat Exchanger Design

# Engineering

- Concept
- FEED
- Detailed Design
- Offshore
- Onshore
- Petrochemical
- Chemical Plant

### Safety Studies

- HAZOP/HAZID/HI RA
- QRA
- Dispersion Studies
- PSM Studies



### Conceptual Project

- Integration of flare refinery and Petrochemical France location: Covering Option Study, Calculation verification, and proposal finalization
- Liquid Recovery from the Gas Compression Platform

### FEED Projects/support

FEED Verification of Gas dehydration Unit inclusive of AGRU.

Covering performance of all process deliverables verification by performing calculations such as Process Simulation, sizing calculation (Equipment, packages, lines, flare system), Datasheet verification, Process and general reports, and their consistency. All the calculations were performed as part of the verification.

Three Offshore Wellhead platform Process Engineering (and part of Safety and Mechanical Design)-Ongoing

Covering performance of all Process Design including Design Basis, Process Simulation, PFD, HMB, P&ID, PDS, HAC, HAZID & HAZOP Close-out, Vent Dispersion and radiation Study, F&G Mapping Study, MDS Specialized Items, etc.

Brownfield Modification of Petrochemical plant for end product change

We have performed calculations on PSV, Hydraulics for lines, Pump, control valves, PDS and IPDS updates, Utility Summary, Fired Heater Instrumentations Study, etc.

LNG Re-gasification Expansion project - Process Engineering (and part of Safety)

Covering performance of all Process Design including Design Basis, Process Simulation, PFD, HMB, P&ID, Process Calculations (BOG, Re-condenser, Vaporizer, PSV, Pumps, CV, line hydraulic, utilities), PDS, IPDS, HAZID & HAZOP Close-out, inputs to other disciplines, etc.

Modification in the existing plant for catalyst change

Covering performance of all Process Design including Design Basis, Process Simulation, PFD, HMB, P&ID, Datasheets, inputs to specification, etc.

- Design for Gas Line
- Mobile Flare System
- GCPL Terminal Lines Hydraulic and Surge Study Ongoing



### **Detailed Design Project**

- Detailed Design of Lube oil Expansion Project, Patalganga
- ☐ Two Offshore Platform Detailed Design
- ☐ Flare System Design of Nigeria Plant
- □ ADES GPC GG Platform Conversion from Manned Platform to Standalone Platform Ongoing
- □ WEB Offshore Field Development Project WEB and PAPYRUS Platforms Ongoing



### **Extended/Value Engineering**

- ☐ FA Study of Sub-sea facility to FPSO (North Sea)
- Multi-phase pipeline network (comprising of 43 pipelines) using OLGA for existing field for Flow Assurance activities.
- Sand Transport Flow Assurance in subsea well to FPSO (North Sea)
- Black Start-up study of CPP
- Well Cycling operation Study for anticipated low pressure downstream
- Subsea well pipelines shut-in and cooldown study
- Process Cut-over Philosophy development of Middle East Client
- Well Test Unit Process Design of Middle East Client
- Preparation of Safeguarding Memorandum and vent system.
- Surge Analysis of Firewater network of Petrochemical Complex for International Location
- Surge Analysis of Closed-loop cooling water system for International Location
- Surge Analysis of Community water (180 km distribution) supply at western India rural area
- Surge Analysis of LNG receiving Terminal
- Surge Analysis of 2 no. Water pipeline sizing and Surge Analysis of Middle east facility.
- Surge Analysis of Water Hammer study of water injection network (North Sea)
- Surge Study of 18 jetty pipeline to the terminal (Ongoing)
- Air Separation Unit Process Simulation with extensive heat integration and Column Hydraulics
- 5 no. Distillation Column replacement with simulation and Column Hydraulics
- Few Hundred Heat Exchangers Designs using HTRI and Aspen EDR (250+ Exchangers)
- Emergency Isolation valve requirement review for different sites in USA



- ✓ Process Engineering Consultancy and Safety support
  - De-bottleneck Study of existing 11 distillation columns
  - Hydraulic study of cooling water, Chilled water, Stream network, and hot-oil network
  - Energy optimization study inclusive of evaluating overall efficiency of the current system
  - Troubleshooting study of the hot oil system.
  - Engineering Design of de-bottleneck proposals including columns, internals, vessels, and heat exchangers
- ✓ Process Safety
  - PSM Gap assessment of Process Safety for Specialty chemicals plants in Gujarat and Roha.
  - QRA study for two tank farm units of Krishna Anti-oxidants
  - Four no. of Relief Valve Inspection Testing Frequency identification for the different international sites (USA)
- ✓ HAZOP/HAZID/HIRA Conducted 25 number
  - Continuous and Batch Process
  - International Locations
- ✓ Training/workshop
  - Process Simulation in Mega Engineering, Pune
  - Basics of Flow Assurance to Senior Professionals of Ingenero Technologies
  - PSM Awareness Workshop for a Major Pharmaceutical company in Gujarat.
- ✓ EU-MRV (GHG for vessels visiting EU Ports) verification
  - MP and ER verification of 11 shipping companies for the last three years.



# **CLIENT'S TESTIMONY**



✓ "I had attended many HAZOP sessions earlier, but this time it was different. It was nice to see that more than standard guide words were captured for this study, which clearly indicates the positivity and hard work which had been put in by you to carry this HAZOP successful to built in safety before the implementation of the project. Many sincere thanks and wish you all the best."

### Mr. Rakesh Goyal, DGM Rallies India Ltd for HAZOP of Dahej Plant

✓ With the ambitious objective in mind to improve process safety performance at our client's end, the professional expertise and integrity showed by your team during the project execution was impeccable. Kudos!

Throughout the project cycle, the activities were well planned in line with the defined roadmap. What impresses us more is the 'Value add' you did to project deliverables with the help of data driven analysis and various sample studies and templates. To make a special mention, the samples and insights provided in final report on SOPs, Chemical compatibility, HAZOP, Bow-Tie and incident investigation are truly appreciated by our client.

With the success of this project, now we are aiming at long term association with this client. We would certainly like your team to join hands with LRQA on this phase 2 of process safety performance improvement.

Mr. Vishal Chavan, General Manager, LRQA, India for PSM Gap Assessment study in Gujarat

✓ "What stuck most about the HAZOP session, that it discuss all points in details, allowing all to understand."

Mr. Yosuf Al-Haj, Mechanical Engineer, Global Company for HAZOP of Chemical Industry (GCI), Saudi Arabia

# **CLIENT'S TESTIMONY**



"We observed the session was conducted with excellent preparation and technical guidance within time constrains by resolving all safety issues professionally.

We strongly recommend the services provided by Sattva EngiTech are of great quality which fits and are at par International Industry standards, we are looking forward to work in association with Sattva EngiTech Pvt. Ltd again for future Process Design and Brainstorming sessions and not only."

Mr. Nilesh Joshi, Director, Chemdist Process Solution Pvt Ltd for HAZOP of Rallies Dahej Plant

"We Krishna Anti-Oxidants Pvt Ltd are writing this recommendation for SATTVA EngiTech Pvt. Ltd. for their services they extended to us on Quantitative Risk Assessment study conducted for our Plant A13 and A1 at MIDC Gane-Khadpoli. We can state with confidence that they are a team of highly motivated and skilled professionals with high degree of integrity.

We observed the QRA study was carried out with highest professional ethics. SATTVA EngiTech used various techniques such as site visits, discussion to get the necessary information to complete the assigned task with agreed timeline. The team was well prepared for all future actions and roadmap was very well defined. What impressed more about SATTVA EngiTech, is the practical recommendations to overcome the limitations observed to demonstrates their teams capability of handling all aspects of Process Safety."

Mr. Ashok Patil, Vice President Works, Krishna Anti-Oxidants, Chiplun for QRA study of Plant A1 and A13

# **CLIENT'S TESTIMONY**



"M/s Sattva Engitech Pvt Ltd has provided the technical support for the flow assurance project to Ingenero. M/s Sattva Engitech has provided the expert consultancy on flow assurance and guided the team for planning and achieving the study objective. M/s Sattva Engitech provided the required insight for the project execution and helped team to successful build the multiphase pipeline network with key functionalities like slug tracking, erosional velocity regimes and identifying the influence of terrain profile on liquid slugging. The support from flow assurance expert proved very useful and we look forward to get associated with M/s sattva Engitech on similar projects in future. We wish all the very best for your future endeavors"

Mr. Abhijit Kharote, Assistant General Manager, Ingenero Technologies, India

"What stuck most about the online HAZOP session is Extreme patience and calmness of HAZOP chairman, wonderful Scribe, Online HAZOP is achievable considering participants in > 4-5 location."

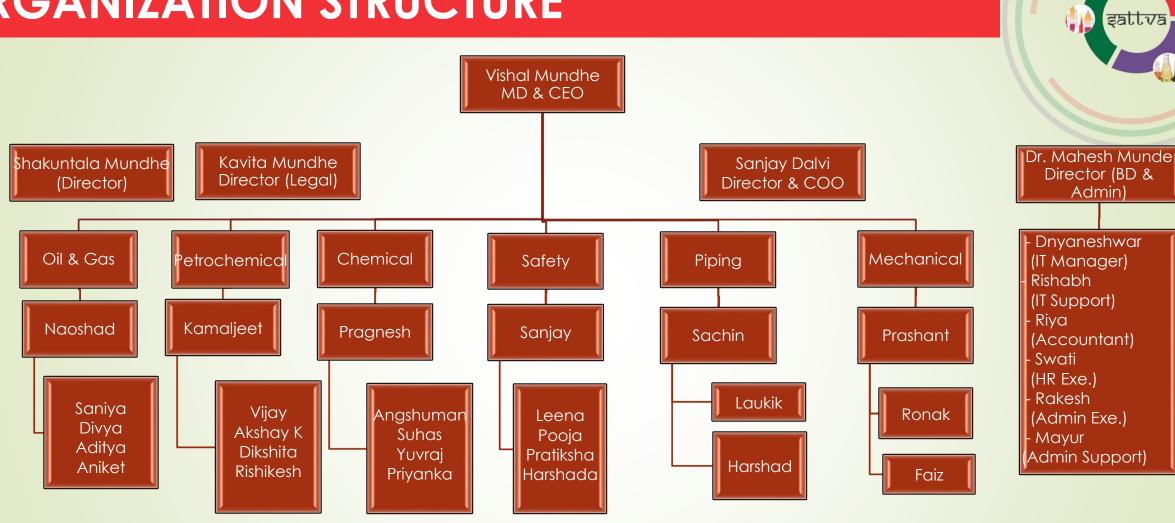
Mr. Srinath Bussetti, Process Safety Engineer, Farabi Yanbu Petrochemical Co. Saudi Arabia.

The simulation task performed by SATTVA EngiTech's team was really challenging as it involves very high purity of all products, product recover >98% and heat integration (no external heat transfer medium). Their team put extra efforts, to resolve various agreements with innovative approach of consolidating objectives, constraints and range of variations. SATTVA EngiTech's team did commendable job of completing the task much before agreed timeline.

Most impressive part of the assignment was bringing practical aspects and showing their expertise in simulation model and distillation column hydraulics. Some of the recommendation made by SATTVA's Team was really added value to project execution team.

Mr. Prafulla Pathak, Proprietor, Ved Enterprises Nashik

# ORGANIZATION STRUCTURE



Process Consultant- K. Kamalahasan, Vaibhav D
Electrical Consultant- Kashinath Kurani, Pankaj Borole
Piping Consultant – Venkat D
Mechanical Consultant - H. Dave

Instrument Consultant- Mayur B.
Safety Consultant- R. Jain
Pipeline Consultant – A. Shete
Structural Consultant – Dr. Alka P.





Er. Vishal Mundhe, CEng IChemE, M. Tech. (Chem, IITM (2003)), P.E. (ECI)

Mr. Vishal has been awarded a Chartered Chemical Engineer by the Engineering Council UK for IChemE in 2013, and a Professional Engineer by the Engineering Council of India in the areas of Process Engineering, Flow Assurance, and Process Safety.

He worked for various design and engineering-related companies like Aker, Mumbai; Ingenero, Mumbai; Sulzer-Chem Tech, Pune; Petrokon Utama, Brunei; Petronas Carigali, Malaysia; Mott McDonald, Oman.

He worked on various steady-state and dynamic simulation software some of them are HYSYS, Aspen Plus, Pro-II, Unisim, Pipesim, OLGA, Pipenet, PVT Sim, Multiflash, FRED, Phast, etc. He is IChemE certified HAZOP chairman and has led many HAZOP/HAZID sessions. His overall experience portfolio ranges from design, troubleshooting, vendor representative as well as and end user. He has given various trainings to junior engineers in Sulzer, Petrokon Utama, and Petronas.

He has 20 years of industrial experience in Oil & Gas, Refinery, and Petrochemical.





### Mr. Pragnesh Dalal, M. Tech. (Chem, IITM (1986))

Mr. Pragnesh is a member of IIChE, India, and Saudi Council of Engineers.

He has worked with various design and engineering-related companies like Reliance Industries Limited, Nagothane; Jacobs Engineering, JGC; Black Cat, Qatar; Ramboll Oil and Gas, Qatar; and SABIC, Saudi Arabia.

He has worked on various steady-state and dynamic simulation software some of them are HYSYS, Aspen Plus, Pro-II, Unisim, Pipesim, PipePhase, Pipenet, FLARENET, etc. His overall experience portfolio ranges from Process design, Environmental engineering, FEED, Detail Engineering, troubleshooting, vendor representative, and end user.

He has led and participated in HAZOP, HAZID, Risk Assessment, Job Safety Analysis, and Process Safety studies for various systems. He is a DNV-certified HAZOP Leader.

Overall more than 30 years of a wide range of industrial experience in Oil & Gas, Refinery, Petrochemical, and Chemical.





Mr. Sanjay Dalvi, M.Tech. (Chem, IITM (2003))

Mr. Sanjay has worked in various capacities at TSEC, Mumbai; UPES, Dehradun; D. J. Sanghvi, Mumbai.

His specialization includes Fluid Flow and Energy System Design. He has actively supported various engineering firms in the design of heat exchangers, Heat & Material balance, and preparation of process datasheets. He has hands-on experience with HYSYS, CHEMCAD, Aspen Plus, Phast, and HTRI. His overall experience ranges from academics to engineering design.

He is a DNV-certified HAZOP Leader. He has led and participated in HAZOP, HAZID, QRA, and Process Safety studies for various systems.

Overall ~20 years of a wide range of rich experience from Refinery, Petrochemical, and Chemicals for problem-solving, design, troubleshooting as well as training.





### Mrs. Kamaljeet Kaur, B.E. (Chem (1994))

Mrs. Kamaljeet has worked at petrochemical plants like IPCL (now Reliance Industries) Vadodara and Mumbai, Jacobs Engineering India; Petrokon Utama, Brunei; Chiyoda Singapore Pte Ltd, Singapore and Jacobs Singapore Pte Ltd (Now, Worley Parsons), Singapore. She has worked on various polymer plant operations on process design and commissioning.

She has experience in various Engineering Software like HTRI, Pro-II, Pipesim, Flarenet, etc.

She is a DNV-certified HAZOP Leader. Her expertise ranges from plant operation/monitoring, process design, commissioning, troubleshooting, and interactions with equipment, catalyst vendors, technology licensors, and end users.

Overall ~22 years of industrial experience in Oil & Gas, Refinery, Petrochemical, and Chemical for problem-solving, design, troubleshooting as well as training.





### Mr. Naoshad Bajan, B.S. (Chem, Texas A&M University)

Mr. Naoshad has completed a B.S. in chemical engineering (2001). He has worked for Glaxo Smith Kline, Mumbai; Dubai Petroleum Company, Dubai; Petrofac Facilities Management International Ltd, Dubai; Dubai Petroleum Establishment, Dubai; PETRONAS CARIGALI Sdn. Bhd., Malaysia.

He has worked in different roles such as Facility Engineer, Senior Process Engineer, and Project Manager at various national and international locations. He worked on various steady-state simulation software like HYSYS, Pro-II, Unisim, Pipesim, OLGA, Pipenet, PVT Sim, Multiflash, FRED, Phast, etc.

He is a DNV-certified HAZOP Leader and has led HAZOP/HAZID sessions. His overall experience portfolio ranges from design, troubleshooting, vendor representative, and end user.

He has 20 years of industrial experience in the Oil and Gas, Refinery, and Petrochemical sectors.





Mr. Prashant Jadhav, B.E. (Mech), CEng (I)

Mr. Prashant has completed a B.E. in Mechanical Engineering in 2003.

He worked for CPE Pvt. Ltd, Mumbai; Abencs Engg Pvt Ltd, Mumbai; Mott MacDonald, Oman; Qatar Kentz WLL, Qatar; Worley Parsons, Oman; Wood Group, Sakhalin, Russia; PR Engineers, Mumbai. Since 2021, he has been working with us.

He has worked in different capacities as a Design Engineer, Design-Estimation Engineer, Sr. Mechanical Engineer, Mechanical Project Engineer, and Lead Engineer.

He has hands-on PV Elite, HTRI, Solid Works, AutoCAD, Advance Excel, Sketchup, Tableau, Power BI

He has around 20 years of industrial experience in project management, design, and detailing, Static and Rotary Equipments in oil and gas (sweet and sour conditions), Refineries, and Petrochemicals.





### Mr. Kashinath Kurani (Principal Electrical Engineer)

Mr. Kashinath has worked for Arabian Industries Technical Support LLC, Oman; Wood Group-CCC Ltd, Oman; Octal Petrochemical FZC Salalah, Oman; Bombay Dyeing and Manufacturing Co. Ltd., Mumbai; Dharmshi Morarji Chemicals Ltd., Mumbai.

He has worked in different capacities as an Electrical Engineer, Sr. Electrical Engineer, Manager-Electrical, and Head-Electrical.

He is PDO certified Competent Electrical Person (CEP)

He has over 40 years of industrial experience in Electrical Engineering, project management, and Maintenance Management.

# **SUMMARY**

### **Competent People**

- ✓ Most of the experts are from institute such as IITs and NITs
- ✓ Experts have worked with major Client across globe
  - Petronas, ONGC, IOCL, SABIC, SHELL, Dubai Petroleum, BPCI, HPCL, ...

### **World Class Tools for FA and Simulation**

- ✓ ASPEN Suite- SS and Dynamic HYSYS, EDR, Flarenet, etc.
- ✓ Schlumberger OLGA, Pipesim, Symmetry, Flaresim, etc.
- ✓ Phast, Safeti, Pipenet, PHA Works, PV Elite, etc.

### **Project Completion**

- ✓ Delivered value-added services to clients
- ✓ Completed 125+ projects

We really appreciate and thank you for giving us time.



# SATTVA EngiTech Pvt Ltd

**Assured quality services for Engineering and Technological needs** 



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