

Capability Statement

Onspec Tawakol Engineering & Contracting



**ONSPEC
TAWAKOL**

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1. Introduction

OTEC is a rapidly growing, multidisciplinary Engineering, procurement, contracting and Consultancy firm supporting the Energy industry with a wide range of engineering solutions.

We Provide software solutions to the industry "focusing on Oil and Gas production, refining, power and energy utilities" to enhance the quality of production data and to acquire a better understanding of their process operation and performance.

We offer offsite procurement outsourcing solutions and contract management to reduce overall costs allowing clients to focus on their core competencies.

OTEC can also compliment and integrate with your existing contracts and procurement teams. We can provide supply chain consultancy and deliver an expert professional service and help to identify ways to unlock savings and improve performance.

Our key competencies are focused in its superbly qualified staff and its competitively priced services. Our personnel have been successfully in business with many regional and international corporations, demonstrating flexibility in meeting requirements and backed up by a proven record of on spec and timely deliveries.

OTEC is implementing progressive strategies to become a regional leader serving Europe, the Middle East and Africa.

2. Our Vision

OTEC to become a recognized Engineering and Contracting Company in the Oil & Gas and Energy Sector covering MENA region by continuously introducing innovative Value Added Services to our Clients & Partners, while attracting, developing & retaining the best talents.

3. Our Mission

To Execute Engineering, Procurement, Project Management and Process Automation, within the Energy Sector covering MENA region.

We are committed to deliver projects with world-class standards & the most cost effective implementation by respecting both environmental & community aspects.

We recognize Employees as our most valuable asset & our key Instrument to achieve the highest ROI to our Clients, Partners, and Shareholders.



4. Company, People & Skills

At OTEC our success is based on our standards, experienced people, technical people and forward thinking people.

OTEC maintains and is operated by a team summing up over 30 years of experience in the oil & gas industry.

Within the course of our commitment to standards we run an ISO Certified organization.



Being committed to the business environment we maintain an EGPC vendor list registration number 102 for the September 2009 committee.

5. Services

OPEC services specialize in the following domains:

- 1) Engineering
- 2) Procurement and Contracting
- 3) Modeling and Simulation
- 4) Software Packages
- 5) Training Services

A detailed description of the above mentioned disciplines could be found in the sections to come.

Engineering Services

1. Onshore and Offshore Projects

OPEC provides full range of Multi-disciplinary Engineering Services for the Onshore and Offshore projects. The range of engineering services varies from small to detailed design projects. Following on from Consultancy-driven pre-FEED services, OPEC executes the following Engineering Services for both new and existing facilities:

- Front End Engineering and Design (FEED)
- Detailed Design
- Brownfield Engineering
- General Engineering Support
- Construction Management
- Project Management and Technical Support

OPEC provides engineering services from FEED through to construction management and has extensive experience of the following project types:

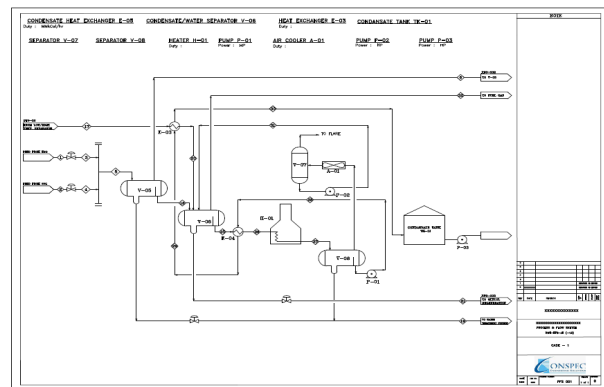
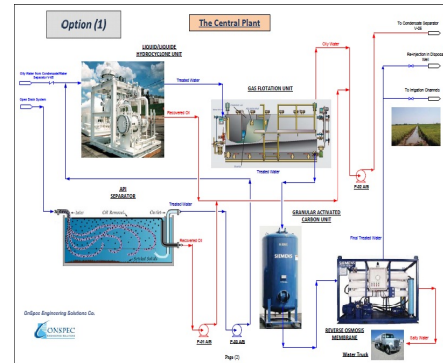
- Gas gathering
- Gas processing, including separation, dew pointing and compression
- Condensate and Crude stabilization
- Produced water handling
- Water injection
- Debottlenecking and Expansion of existing assets
- Asset integrity and process safety upgrades
- Manned and Un-Manned Platforms
- Floating Production Storage and Offloading

All these types of engineering studies are covered and fully managed within OPEC. According to the nature of a project, engineering studies will include all or part of the following steps:

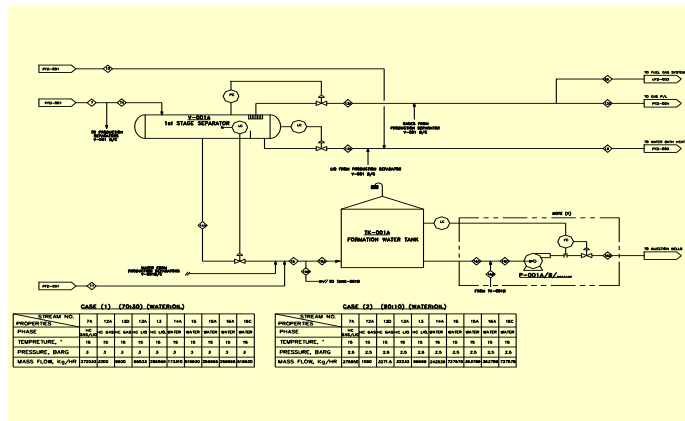


1.1 Basic Engineering Design (BED)

- Conceptual process studies (material balances, process flow sheets...) and preliminary plot plan.
- Preliminary Piping and Instrument Diagrams.
- Definition and sizing of main equipment resulting in process specifications.
- Specification of effluents.
- Definition of control and safety devices.
- And, generally speaking, all the basic studies required to support a Basic Engineering Design Package (BEDP) containing all data needed by a competent contractor to perform the Detail Engineering.
- These basic engineering studies may consist of consolidating a Process Package initiated by an external process licensor.



1.2 Front End Engineering Design (FEED)



OTEC can deliver high end projects as Front End Engineering and Design is a basic engineering design which comes after the Conceptual design or Feasibility study. OTEC focuses on the technical requirements as well as rough investment cost for the project. Also OTEC can deliver the FEED project as divided separate packages covering different portions of the project.

OTEC develops the project from a basic engineering package to a package

suitable for use as the basis for detailed design. FEED includes the preparation of a +/- 15 – 25% cost estimate. The FEED can be divided into separate packages covering different portions of the project.

FEED development includes:

- Develop Process Description and Process Flow Diagrams.
- Develop Piping and Instrument Diagrams and control philosophy.
- Preparation of project equipment sizing and specifications.
- Preparation of process and mechanical datasheets for equipment.
- Preparation of major instrument & electrical datasheets such as multiphase flow meters, Choke valves, emergency shutdown valves and switchboards.
- Develop Plant Layout, including equipment location, pipe routings, walkways, escape ways, buildings and room layouts.



- Offshore structural design support of the topsides and substructure, if applicable.
- Design reviews including HAZID, ENVID, SIL, HAZOP, RAM and others as necessary.
- Procurement activities for major equipment items and Long Lead Items to enable order placement.

1.3 Detailed Engineering services

OTEC can develop world quality detailed design projects. Detailed design is generally the development of a FEED into a physical asset that achieves the design requirements of the project. The detailed design activities are:

- Finalization and reviewing of Piping and Instrument Diagrams for construction release.
- Preparation of piping isometrics for construction including stress analysis.
- Preparation of power and control deliverables, including power distribution and control systems for construction.
- Preparation of civil/structural (as required), Foundations, Structures And Buildings construction drawings.
- Procurement of all equipment items.
- Development of commissioning and operating documents.
- Technical safety support to the project design to ensure safety in design.

1.4 Brownfield Engineering

OTEC has extensive experience of brownfield engineering for a wide variety of onshore and offshore facilities throughout the Middle East and North Africa. OTEC has carried out a wide variety of brownfield engineering activities from small modifications to major facility upgrades.

We use the latest survey techniques and tools to obtain accurate as-built data of the physical asset. This approach minimizes onsite modification and rework therefore reducing the installation time.

1.5 General Engineering Support

In addition to the execution of specific project scopes, OTEC also provide General Engineering Services Contracts to support Operators. OTEC generally provide a dedicated team for General Engineering Support that will work on a number of scopes simultaneously. As the workload increases or decreases the team size is adjusted accordingly. This team based approach enables a relationship to be developed with the client discipline specialists to ensure that the client requirements are properly understood and interpreted.

OTEC also routinely provides embedded discipline engineers as a part of General Engineering Support. These engineers effectively work as a part of the client engineering team. Depending upon client requirements the number of embedded engineers can vary from 1 or 2 to over 20 engineers.



Examples of executed type of studies:

Concept Selection studies	Preliminary Screening Designs	Process Technical and Economic Evaluations	Existing Process Evaluations
Relief/Flare/Vent Studies	Throughput Debottlenecking	Pilot Plant Design, Evaluation, and Scale up.	Greenfield Plant Designs
Plant Expansion studies	Process Modelling and Simulation	Hydraulic Analysis	Capacity verification & impact assessment
Cost Estimates	Independent Design Verifications	Process Engineering Team Support	Existing Equipment Utilization Studies
Process evaluation, troubleshooting, optimization	Debottlenecking.	Control system start-up, tuning, optimization	Commissioning and start-up assistance
Operating procedures, process documentation	Hazard Operability Study (HAZOP)	Unit operation design/evaluation.	Process/equipment bid package preparation.
Vendor bid evaluations and recommendations.	Expert witness/legal team technical assistance.		

1.6 As-Built Documentation

OTEC understands the importance of As-Built documents to the Plant Engineering industry. If construction drawings are the only source of documentation, minute changes or deviations from construction documents can go unnoticed or are misinterpreted. This could prove very costly for further changes or upgrades made to the plants and so this requires a highly meticulous approach to get this right.

Whether you manage an existing plant facility or are building a new one, OTEC's As-Built documentation expertise provide as-built with a higher level of accuracy at a highly economical cost, allowing you to get a measure of clarity in planning your further construction better. OTEC can provide as-built documents either to get a project started or at the end, based on the preference of the clients and the stage of the project.

Our Quality Engineering in "As-built Documentation" provides the ability to review and upgrade facilities without physically visiting the location.

The benefits from as-built documents lie in:

- Capturing construction deviations from construction documents.
- Important Resource for future maintenance and planning.
- Provides a snapshot of existing design.
- Verify and confirm existing assets, or assets acquired through mergers & acquisitions.

2. Discipline Engineering

2.1 Process Engineering

Process Engineering is vital across our business. We design and optimize chemical processes. We also provide technical support to oil and gas production facilities, refineries and chemical plants – both onshore and offshore.

As part of OTEC world-class Process Engineering team, our main responsibilities include;

- Ensuring technical integrity of process engineering deliverables to provide for a safe, efficient and operable facility.
- Design, Optimizing and Improving the operation of equipment and facilities



- Advising on process safety issues
- Analysing and interpret laboratory and plant data, or commission new installations.
- Directing and guiding the process engineering activities of the team to generate alternative technical solutions and options during all phases of the project to support business strategy.
- Customizing and implementing appropriate process engineering related work procedures and systems.
- Identifying and securing the appropriate process engineering resources for the project to deliver quality process engineering deliverables within the agreed project schedule.
- Monitor performance against project schedule and technical quality targets for process engineering deliverables (include own team, EC & Technology Providers).

OPEC delivers benefits to oil and gas development projects throughout the project lifecycle. Our focus is on developing process engineering knowledge to provide practical solutions to engineering issues. Deliverables include:

- Conceptual and Preliminary Process Designs
- Detailed Process Designs
- Detail Engineering Phase Process Integrity Oversight
- Process Technical & Economic Evaluations
- Pilot Plant Evaluation and Scale Up
- Process Design Components
- Process Modelling and Simulation
- Operations Support

2.2 Piping Engineering

Conceptual Plot Plan for the project starts with the Piping Engineering activities. Plot Plan Layout of major equipment items, interconnecting pipe racks, flares, storage tanks and utility units are defined under basic engineering. The facility layout is defined under multi-discipline engineering review to consider safety and operational aspects of the plant. Piping engineering typically follow the drive through piping layout, piping modelling, 3D model review, isometrics, preparation of material take-offs and requisitions.

Piping Engineering play a very important role in development of Oil, Gas & Petrochemical Refineries, Power Plant, Fertilizers Industries and of re-construction of Plants, related to EPC.

OPEC's Piping Engineering Activities include:

- Project specific standard development
- PDMS development
- Equipment layout engineering
- Piping Routing (2D & 3D).
- Piping material engineering & procurement assistance (MTO Calculation for estimation & procurement)
- Piping support design engineering
- Piping stress analysis engineering
- Reverse engineering (As-built updating)

2.3 Equipment Engineering

OPEC's Equipment Engineering team is an expert in dealing with Static Equipment including storage tanks, vertical and horizontal pressure vessels, shell and tube heat exchangers, towers, reactors,



condensers, and evaporators. Our team is familiar with various international codes and standards like ASME Section VIII Div-I and Div-II, API 650 and API 653.

Detail Engineering Activities Include:

- Equipment Design engineering
- ASME Design Calculation
- Fabrication Drawing
- Tank design and stress analysis

2.4 Civil Engineering

Civil is a significant discipline that works in concurrence with the other disciplines like Piping, Electrical and Instrumentation. It is a key player for building the base for all the other disciplines as it designs their foundations. Civil & structural Engineers define areas of the construction through Piping Layout group and show it on the site wide Plot Plan.

OTEC through its trusted associates is capable of providing the below Detail Engineering Services for the Civil & Structural Discipline:

- Design of Superstructures for Refinery and Petrochemical Unit
- Infrastructure design (Water supply, sewage, firefighting networks, trenches)
- Foundation Design
- Design and Engineering of Skids and Modular Structures
- Pipe and Cable Rack Structures
- Design of Foundations for Large Process Equipment
- Fixed Offshore Structures.

OTEC experience is also in the preparation of inspection procedures, modelling the offshore structures using SACS software and performing the In service static analysis, the hydrodynamic analysis and Dynamic & Earthquake Analysis.

2.5 Electrical Instrumentation Engineering

The final stage of Detail Engineering is concluded by the Electrical and Instrumentation Disciplines which come into picture after finalizing the location of major items like substations, field auxiliary room, main control room etc. Electrical and Instrumentation Engineering are key players in estimating the Project Cost & Efforts before customers takes investment decision. The input for Electrical and Instrumentation Engineering comes from piping engineering group on plot plan, equipment location, control valve location etc. Electrical and Instrumentation disciplines work hand in hand together to perform the engineering.

OTEC through its trusted associates is capable of providing the below Detail Engineering Services for the Electrical discipline:

- Cable Sizing
- Cable Tray Layouts
- Load Calculation
- Single Line Diagram
- Generation & Updating of Single Line Diagram (SLD)
- Preparation of Layout (Earthing/Lighting)
- Power and Control Cable Design & Layout
- SCADA I/O List
- Interface Activities with Civil / Machinery / Instrumentation



- Coordination with Civil for Floor Openings,
- Electrical Equipment Foundation, and Plants
- Electrical Data Input for Packaged Equipment
- Lighting Distribution
- Earthing And Lightning Protection
- Power Generation & Distribution Systems

OPEC through its trusted associates is capable of providing the below Detail Engineering Services for the Instrumentation discipline:

- PLC/DCS (System Engineering)
- Instrument Data Sheet & Index
- Preparation of Cause & Effect Diagrams
- Defining Field Instrument & Control Panel Specification
- Loop Drawings
- Instrument & Electrical Interconnection Drawing
- JB & Cable Schedule
- Logic Interlocks Drawing
- Instruments Cable Tray Layout
- Instrument Location Plan
- Bill of Materials
- Level Sketch Diagram
- Instrument And Control Systems
- Tele-Communications And Data Networks
- Fire Detection, Alarm & Protection Systems

3. Modeling and Simulation

OnSpec Process engineering studies cover a vast spectrum of the Oil & Gas processes and applications. Process engineering studies & Solutions are manifested in the following:

- Dynamic and Steady State Studies
- Operator Training Systems (OTS)
- Flow Assurance Studies
- Optimization Solutions
- Performance Monitoring
- Production Planning Tools

3.1 Dynamic and Steady State Studies

At OPEC we utilize dynamic simulation & modelling of topsides process facilities for the Oil and gas Industry. The models are used to verify the process design and process control strategy through engineering studies to replicate the response of the real plant.

The high fidelity dynamic models we produce for engineering studies contain the detailed process design data to produce realistic responses to process operation and upset. The models are used to evaluate the transient performance and produce graphical information indicating The response of the process under study conditions. They are therefore required to provide accurate solutions within the operating envelope of the events being studied, but do not necessarily need to operate under all conditions.

Process & operation studies encompass:

- Process design verification
- Optimization studies
- Control system design verification
- Bottleneck analysis
- Multi / single phase transient studies
- Compressor Operation Studies

3.2 Operator Training Systems (OTS)

OTEC employs one of the world's largest and most experienced teams of specialists in Modelling, Simulation and Design Automation solutions.

We utilize our team extensive and rich experience to deliver fully integrated **Operator Training Systems** in conjunction with state-of-the-art tools from market leading Software providers.

Our capabilities cover the full scope of **Operator Training Simulators** including:

- OTS Dynamic Modelling
- Integration of Process & Pipeline Models
- Instructor & Trainees Stations
- System Integration

OTEC has the capability of providing high fidelity OTS dynamic models for the different oil and gas processes such as:

- Oil & Gas upstream facilities
- Gas Processing & Oil Refining facilities
- GTL, NGL, LNG
- Compression Systems
- Steam Generation Systems
- Multiphase flow in pipelines

We also provide integration of pipeline models with process models to obtain a fully integrated OTS for the whole cycle of production.

3.3 Flow Assurance Studies

OTEC delivers transient flow analysis studies using OLGA[®].

Pipeline flow assurance and well dynamics with OLGA ensure technical, operational and HSE integrity during design and operation of production systems throughout the entire life cycle. This results in capital and operating cost effectiveness. OLGA is used in feasibility studies, conceptual studies, FEED and detailed designs and is essential for defining operating procedures and control schemes.

Application examples:

- Transient thermo hydraulics during start-up/shut-in
- Optimal design for maximum operating envelope Process and control system design
- Flow assurance, investigating hydrates, wax, asphaltenes, corrosion, emulsions, scale and sand
- Liquid inventory during pigging and rate changes
- Slug mitigation and control



- Fluid systems that can be modelled:
- Oil and natural gas flow lines
- Wet gas and condensate flow lines
- Well stream fluids
- Dense phase flow lines
- Single phase gas or liquid flow lines
- Laboratory experiments
- Full network capability

OLGA has full network capability, allowing for definition of converging and diverging transport and process networks as well as closed loops. This flexibility enables our engineers to simulate a set of applications such as well and pipeline networks, gas lift and complete process systems

3.4 Optimization Solutions

The Process industry operates in a highly competitive environment, where small percentage changes in operational efficiency can result in significant effects on the bottom line profitability of the enterprise. Process optimization enables running the plant closer to its operational and financial limits. It relies on evaluating all of the various constraints of the production processes along with the business targets set by the key decision-makers.

Optimization can be provided as an on-line solution, i.e. directly connected to the live process, or it can be carried out off-line. This facilitates the detailed modelling of 'what-if' scenarios, and enlightens an objective assessment of business choices, which allows decision makers to obtain the best value for the business.

Optimization services may be carried out as a standalone project or may be part of a broader project for process modelling, dynamic simulation or operator training simulators.

3.5 Performance Monitoring

Using real-time plant data and rigorous simulation, OnSpec performance monitoring solution facilitates the following:

- Diagnosing the root causes of process performance degradation
- Determining the economic impact of performance degradation
- Monitoring the current performance of equipment relative to design
- Tracking actual performance against plan and understanding deviations
- Anticipating the need for performing maintenance
- Identifying faulty instrumentation and resolve process problems quickly
- Exploiting intelligent soft sensor capabilities to calculate unmeasured process parameters.

3.6 Production Planning Tools

OTEC provides model based Production Planning tools for assisting Oil & Gas Production companies in production allocation and scheduling, in order to meet their customers' demands whilst abiding by any technical or regulatory constraints.

4. Project Management & Outsourcing

In addition to executing projects, OTEC also has significant experience of providing Project Management and Technical Support to our clients. These services can vary from a full project management team to overseeing an engineering contractor executing a project through to design verification services. OTEC takes pride in being able to tailor our offering to our clients' needs.

OTEC provides:



- Overall Project Management
- Contract / Subcontract Administration
- Planning And Scheduling
- Cost Estimation
- And Budgeting
- Progress Evaluation And Reporting
- Cost Control
- Material Monitoring
- Corrective actions to maintain schedule & budget
- Highly skilled outsource engineers

5. Software Solutions

OTEC is the technology partner of SPT Group (Formerly Scandpower Petroleum Technology)

AspenTech, we are the regional distributor for their software (S/W) products in the Middle East and North Africa (MENA).

BELSIM, we are the regional distributor for their software (S/W) products in the Middle East and North Africa (MENA).

OTEC has strong business relationships with its mentioned partners, which exceeds cooperation in sales and marketing activities to solutions implementation, support and training services.

5.1 Software Solutions from SPT Group

As the representative, channeled partner and Value added reseller of SPT Group in North Africa, OnSpec markets and supports different SW packages developed by SPT as well as offers jointly model based solutions and services. OnSpec is also recognized as an SPT Technology Implementation partner.

5.1.1 OLGA:

OLGA is the market leading transient multiphase flow modeling and simulation S/W. **OLGA** can be used all over the project life cycle from Conceptual Design, FEED, Basic & Detailed Engineering to operation resulting in overall capital and operating cost effectiveness.

OLGA covers a wide range of applications, such as:

- Slug mitigation and control
- Optimal design for maximum operating envelope
- Liquid inventory during pigging and rate changes

5.1.2 EDPM:

EDPM is a dynamic on-line production support system, deepening the understanding of multiphase flow and enabling a proactive and cost effective operation for multiphase production systems.

EDPM provides information from parts of the production system that instrumentation cannot reach, which allows the development of advanced operation advisors based on SPT Group's accumulated knowledge of field production. An open structure gives ready access to third party software developers and operators, inviting further innovations.



5.1.3 MEPO:

Optimization tool for reservoir history matching and production forecast uncertainty assessment. It works in harmony with reservoir simulators and is capable of undergoing the history matching process on a reservoir much faster than using the conventional manual methods saving as much as 70% of the time required.

MEPO is now being used by an increasing number of oil companies who are already reaping its rewards, like lower development costs, more efficient well placement, and increased confidence in field development decisions.

5.1.4 Drillbench:

Drillbench is a package of S/W tools for dynamic simulation of drilling hydraulics and well control. It has a number of applications, for example:

- Modeling of ECD & ESD
- Modeling of thermal effects
- Kick tolerance calculations
- Sensitivity studies
- Evaluation of well design
- Risk evaluations

5.2 Software Solutions from AspenTech

As the representative and channeled partner of AspenTech in North Africa, OnSpec markets and supports several S/W packages developed by AspenTech for Integrated lifecycle solution. AspenTech's S/W packages cover from conceptual design to plant startup and operations support, enabling customers to build and operate safer and more competitive and reliable process plants. AspenTech Products reduce capital and operating costs, increase engineering efficiency and quality, and accelerate time-to-market, delivering ROI in months. OnSpec is also recognized as an AspenTech training partner.

AspenTech S/W leverages industry-leading process engineering solutions including **Aspen HYSYS**, **Aspen HYSYS Dynamics**, **Aspen HX-Net**, **Aspen Simulation Workbook**, **Aspen Flare System Analyzer**, **Aspen Tasc+** and **Acol+**, **Aspen Process Economic Analyzer**, and more.

AspenTech S/W supports operational excellence by enabling continuous improvement through monitoring, de-bottlenecking and revamps. Through improved planning model accuracy, AspenTech S/W improves agility in operations and enhances the responses to changing market conditions, including evaluation and selection of optimum crude oils.

With AspenTech S/W products, engineers are empowered to work faster and smarter and deliver greater value-added services to the plant. Engineers are equipped to enhance the speed and consistency of their simulation, costing and sizing activities, thereby delivering increased productivity, improved design quality, and better decision-making.

5.2.1 Aspen HYSYS:

Aspen HYSYS is the market leading process modeling and simulation S/W. **Aspen HYSYS** can be used all over the project life cycle from Conceptual Design, FEED, Basic & Detailed Engineering to operation resulting in overall capital and operating cost effectiveness.

5.2.2 Aspen HYSYS Dynamics:

Aspen HYSYS Dynamics extends HYSYS steady-state models into dynamic process models, enabling design and verification of process control schemes, safety studies, relief valve sizing, failure analysis, and development of startup, shutdown, and operating mode changes.



5.2.3 Aspen FLARE System Analyzer:

Aspen Flare System Analyzer software is used for the design, rating, and debottlenecking of flare and vent systems.

FLARENET enables engineers to perform steady-state design, rating, or debottlenecking of single or multiple flare and vent systems. The software can calculate minimum sizes for new flare systems or evaluate alternatives to remove bottlenecks in existing relief networks. **FLARENET** can also be used to identify potentially dangerous relief scenarios during design phase or current operational scenarios.

6. Training Programs in Process modeling and simulation

OnSpec has highly qualified instructors who instructed numerous simulation and modeling training courses to Oil & Gas industry leaders in Egypt and internationally.

OnSpec training courses covers:

- Upstream technologies.
- Gas Processing Technologies.
- Oil Refining Technologies.
- Petrochemicals
- Oil & Gas Transportation through Pipelines.

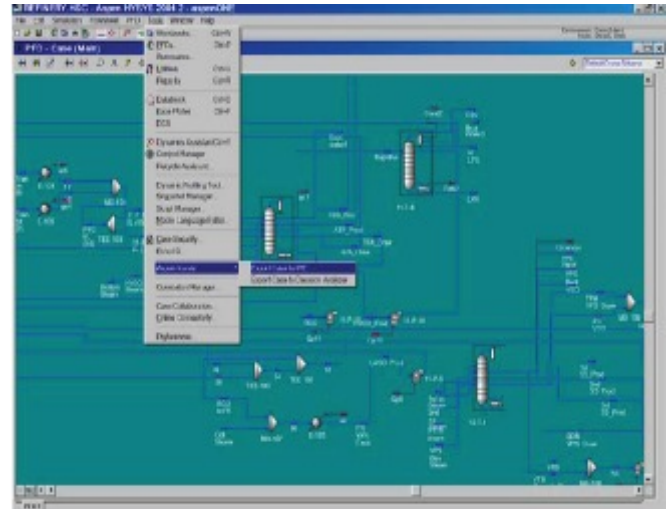


Aspen HYSYS

- Discover how the key features of Aspen HYSYS allow rapid flowsheet construction.
- Use the Workbook and Process Flow Diagram (PFD) interfaces for quick and effective modeling
- Investigate how templates and subflowsheets can streamline and organize simulation.
- Evaluate the performance of existing equipment with the Rating function
- Improve the convergence performance of a simulation

Aspen HYSYS Dynamics

- Solve complete dynamic problems by first building a steady-state flowsheet and then performing steps to transition to dynamics
- Learn pressure flow theory, column dynamics theory
- Interpret pressure flow specifications, strip charts
- Learn techniques and “rules of thumb” for controller tuning
- Learn how capacitance and dead-time affect controllability



Aspen HYSYS Petroleum Refining “RefSYS”

- Gain experience on the use of the most advanced technology for rigorous refinery simulation
- Utilize flowsheet and FCC reactor model to understand refinery’s true operating window
- Learn new refinery specific unit operations
- Explore the data generation tools which enable improved planning and scheduling decisions

Aspen Flare System Analyzer “FLARENET”

- Learn how to rigorously model flare systems and equipment, and develop practical experience through modeling exercises
- Explore the two-phase modeling capabilities
- Examine the equipment sizing, rating, and debottlenecking capabilities



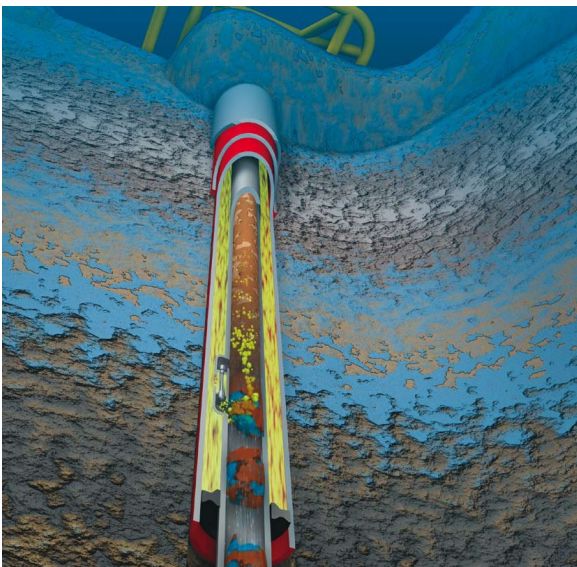


OLGA

- Understand flow assurance challenges
- Learn fundamentals of multiphase pipeline thermo-hydraulics
- Learn how to simulate
 - Basic production hydraulics
 - Slugging and Slug tracking
 - Gas-lifting in a well-tubing
 - Pipe sizing and slug catcher sizing Thermal issues - Insulation and Burial
 - Shut in - Cool-down - Depressurization - Restart with Compositional Tracking

DRILL BENCH

- Dynamic drilling hydraulics
- The impact of temperature
- Dynamic surge and swab calculations
- Manual choke control and understanding of the interaction with the reservoir
- Kick tolerance calculations
- Evaluation of safe circulation of a kick
- Drilled and swabbed kick
- Dissolution of gas (OBM vs. WBM)



Aspen Plus

Gain the practical skills and knowledge to begin modeling new and existing processes

Learn some practical techniques for building and troubleshooting flowsheet simulations

Reduce process design time by testing various plant configurations

Determine optimal process conditions to improve current processes

Help de-bottleneck constraining parts of a process