Oil & Gas Industry

ENGIN SOFT

Designing for complex engineering environments isn't best suited to trial-and-error. Efficiency and risk must be assessed upfront during the design phase itself. Shop tests are clearly applicable at the end, but they are really just a means to confirm the design was correct. A simulation based approach therefore is the only one which can efficiently derive the correct sizing of a structure and components, evaluate different 'what-if' scenarios and then deliver the required robustness.

Roberto Kross,
Technical Director,
MIB

CAE simulation and implementing correct Finite Element Models to replicate real phenomena is becoming essential for business competitiveness. Correlation verification between experimental and theoretical data is vital for the facilities and assets we develop and build. For example mining plants, hydroelectric power plants or Oil & Gas plants must provide ongoing productivity for years with minimized, even eliminated downtime. Here simulation offers good and reassuring performance guarantees.

Rossana Mattanza,
Executive Manager,
CIB

Clients

De Pretto's very high level technical skills in managing complexity and extensive use of technologies to develop and design novel and cost-effective offshore equipment are highly appreciated throughout the industry. As the optimized design and engineering phase typically accounts for up to 20% of total project costs it is fundamental for subsequent equipment procurement and facility construction and absolutely imperative in ensuring the facility will operate effectively for decades to come.

Paolo Dallona,
Oil & Gas Business Unit Manager,
De Pretto Industrie

We support customers from early design stages for lay-out definition and optimization. Based on our expertise and many years of successful systems delivery we help customers focus on the best possible solutions for their needs. 3D modeling and Finite Element analyses are carried out as a standard practice for weight optimization and project reliability, representing key success factors in terms of speeding up the design process as well as reducing costs and increasing performance.

Davide Ortolani,
Engineering Manager,
F.lli Righini
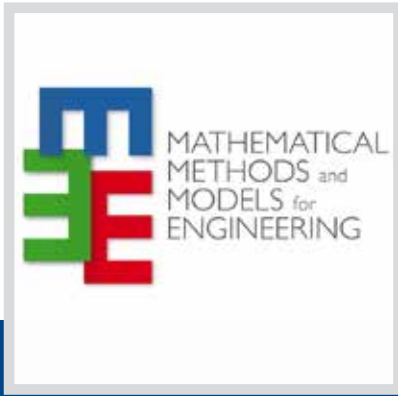
M³E, Italy

M3E is a high-tech spin-off from the University of Padova with a remit to develop applied mathematical models and advanced software for the solution of typical and/or specific problems in the Oil & Gas Industry. M3E developed software includes subsurface modelling, geomechanics, high performance computing and data analysis for several engineering applications. M3E also provides experienced consultancy services for underground hydrocarbon processes.

www.m3eweb.it

ESSS, Brasil

Provides multiphysics solutions backed by a full portfolio of services focused on simulation, consulting, customised software development, technical support and training. Within O&G this includes: simulation solutions, software development for exploration and production, reservoir refining and supply operations, basin and well modelling, underwater structures for oil extraction, offshore structures for oil production, refining and supply equipment, pipelines and multiphase flow transportation.

www.esss.com.br

Partners

CASCADE, United States

The core technology is developing "state of the art" software for Large Eddy Simulation (LES) applications in aeroacoustics, turbulent combustion and multiphase flow. Features of Cascade's LES solver infrastructure include: non-dissipative numerical algorithms, large scale parallel simulation efficiency, high fidelity multiphysics capabilities (including reacting and mixing flows) and enhancements by resolved scale information (no ad-hoc tuning).

www.cascadetechnologies.com

Aqua Engineering, Italy

Aqua Engineering have expertise within the Oil & Gas sector in the following areas: system engineering, structural and hydrodynamic analyses, marine operations and process package designs. Several joint client projects have benefited hugely from the combination of Aqua Engineering's expertise and EnginSoft's advanced CAE capability: (ILS/ILV and SWRP – Saipem, PSC prototype – Tecnomare). This strong integrated multidisciplinary team offers huge benefits to our clients.

www.aquaengineering.it

EnginSoft Value

Oil & Gas is a mature sector with a long development history and good levels of reliability and performance. Yet change is continuing to accelerate, both in the competitive environment and the development of innovative products.

EnginSoft understands that the demand for continuous improvements cannot be delivered through isolated technologies such as mechanics, fluid dynamics, emerging methods or process calculations. The challenge of Virtual Prototyping is to integrate all of these technologies, and more, into a unique design and optimization process.

This is where the CAE market is moving and this is where EnginSoft are already operating, which is why partnering with EnginSoft can make a real difference to your company. A vast experience in multi-disciplinary simulation consultancy is fueled by continuous investment in in-house R&D and the provision of High Performance Computing (HPC) resources, making EnginSoft the most reliable and knowledgeable partner for product development.

The knowledge and commitment of EnginSoft's engineers' helps clients' identify the most suitable solutions for complex requirements. Leading edge technologies, honed multi-disciplinary methods and access to advanced High Performance Computing (HPC) are all applied to achieve shortened development times and improved resource utilization.

EnginSoft also makes sure that the underpinning expertise is effectively transferred to all customers, who thereby acquire a tangible, strategic advantage.
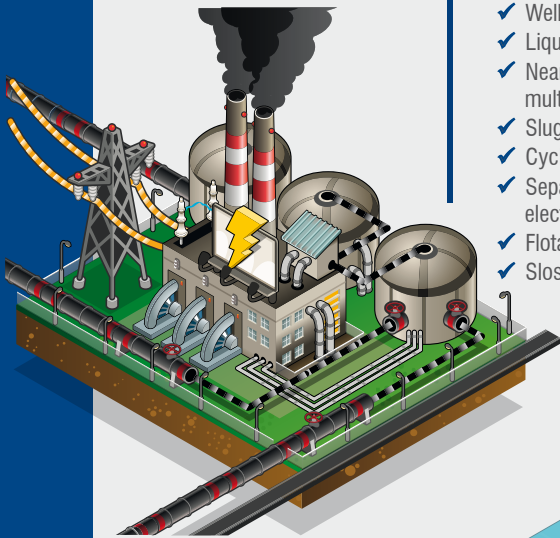
# The future of conception to completion

RESERVOIR AND GEOLOGY
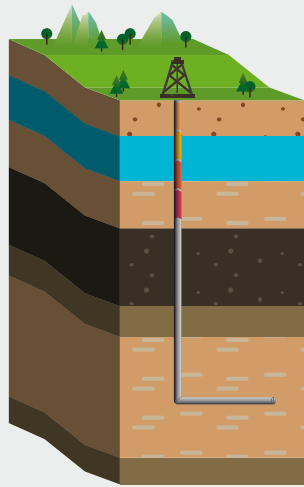
- ✔ Reservoir
- ✔ Basin
- ✔ Well data
- ✔ Near-well
- ✔ Geology
- ✔ Microstructure
- ✔ Scientific visualization
- ✔ Drilling-related applications
- ✔ Infographic - seismic acquisition and boundaries

PRODUCTION

- ✔ Completion processes
- ✔ Well distribution systems
- ✔ Liquid/gas production
- ✔ Near well: modelling and multiphase flow
- ✔ Slug and annular flow
- ✔ Cyclones and hydrocyclones
- ✔ Separators: gravitational and electrostatic
- ✔ Flotation tanks
- ✔ Sloshing: vertical and horizontal
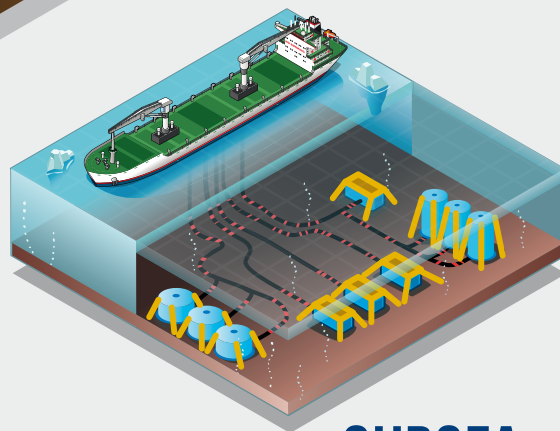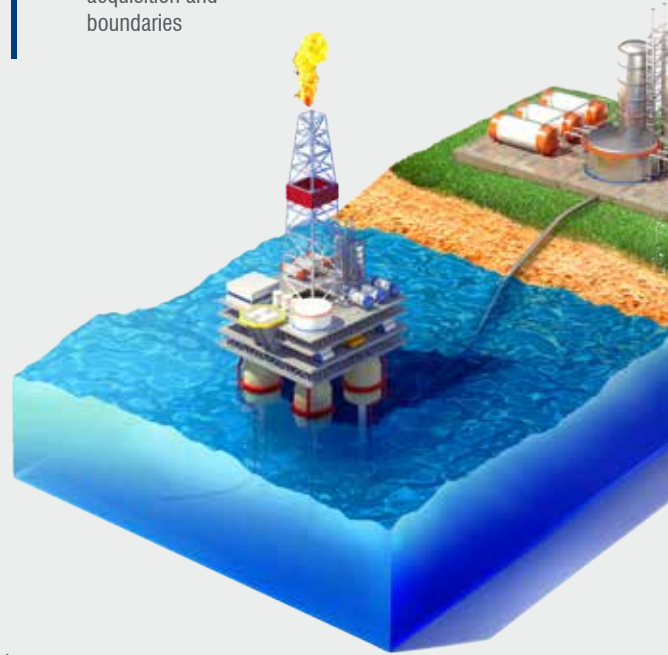
SUBSEA

- ✔ Pipeline Laying
- ✔ Submarine pipeline repair systems
- ✔ PHWT operations
- ✔ Explosion
- ✔ Fire resistance
- ✔ Pumping and injection systems
- ✔ Multiphase pumps
- ✔ Sand control/removal systems
- ✔ Flow assurance and flow patterns

OFFSHORE

- ✔ Fixed offshore structures
- ✔ Floating offshore structures
- ✔ Structural verifications and code checks
- ✔ Stochastic fatigue
- ✔ Pressure vessels
- ✔ Pressure components
- ✔ Floating production system hulls (FPSO)
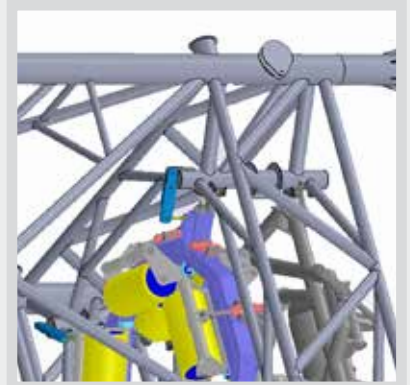- ✔ S-Laying and J-Laying components and devices
- ✔ Impacts

DOWNSTREAM

- ✔ Distillation columns: heat and mass transfer
- ✔ Mist eliminators
- ✔ Process furnaces
- ✔ Coker and vacuum towers: fluid dynamics
- ✔ Inlet feed devices: liquid entrainment, velocity, vapour distribution
- ✔ Target spray patterns
- ✔ Baffles: simulation and establishing criteria
- ✔ FCC process: risers, regenerators and cyclones
- ✔ Flow rate meters/Flow meters

Effective for the system as well as components...

- ➔ Valves
- ➔ Pressure Vessels
- ➔ Couplings
- ➔ Pipelines
- ➔ Pumps
- ➔ Heat Exchangers
- ➔ Nozzles

- ➔ Lifting devices
- ➔ Supports
- ➔ Casted and forged nodes
- ➔ Reactors
- ➔ Jackets
- ➔ Stingers

- ➔ Derricks
- ➔ Mooring connectors
- ➔ Separators
- ➔ Burners
- ➔ Tube bundles
- ➔ Risers
- ➔ Manifolds

Partnering for Innovation & Real Return on Investments
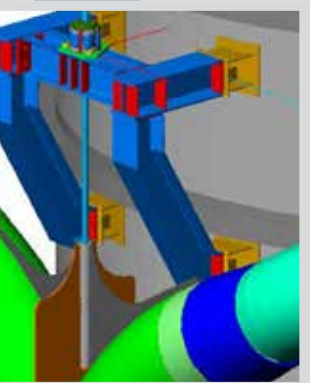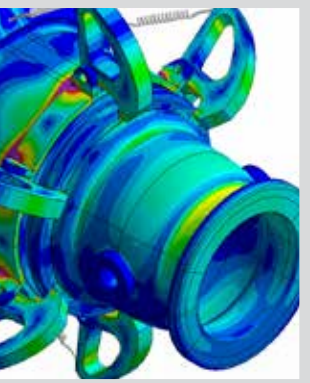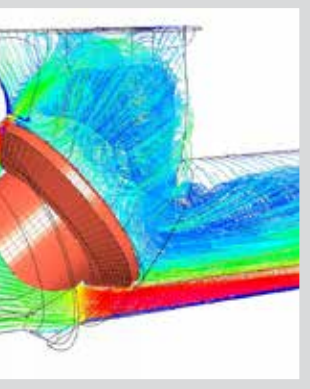
Complex Engineering Challenges

Integrated CAE/SBES Approach

+

HPC

Fatigue
CFD 1D & 3D
Hydrodynamics
Manufacturing
High Speed Dynamics
Design-by-Rules
Explosions
Vibrations
HVAC
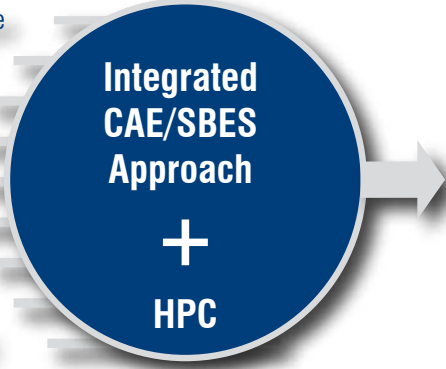
Multiobjective Optimization
Calibration
Risk & Cost Management
Multiphysics & Multi-disciplinary
Lifetime Assessment
Advanced Material

Solution

Performance
Quality
Reliability
Cost
Time

EnginSoft: Complete Oil & Gas Solutions for Systems, Subsystems and Parts Design and Analysis

Design and Analysis by Codes

- ➔ DNV
- ➔ API RP 2A
- ➔ ISO 19901
- ➔ ISO 19902
- ➔ NS3472
- ➔ AISC
- ➔ Eurocode 3
- ➔ ASME VIII Div.1 & 2

- ➔ TEMA
- ➔ API 618, 674
- ➔ ASME B31.3
- ➔ UNI EN 13445-3
- ➔ ASME III (sec. NB & NF)
- ➔ BSI 5500
- ➔ EEMUA 190:2000
- ➔ UBC

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ITALY - FRANCE - GERMANY - UNITED KINGDOM - NORDIC EUROPE - TURKEY - USA

EnginSoft was founded in Italy in 1984 at the forefront of the emerging field of Simulation Based Engineering & Science (SBES). Today the Company retains an international lead in the sector with bases in Italy, France, Germany, UK, Norway, Sweden and the U.S.A.

EnginSoft's biggest asset is its matrix of highly specialist engineers who possess extensive and multi-disciplinary expertise in leading edge engineering simulation technologies. A holistic approach to consultancy provides global support for clients in close integration with key partnership companies located in Greece, Turkey, Israel, Portugal, U.S.A., Brasil, Spain and Japan.

Throughout its long and successful history EnginSoft has remained at the forefront of technological innovation with a track record as a 'sector catalyst' for changing the way that SBES and Computer Aided Engineering (CAE) technologies are applied across several industrial sectors. These include: Automotive, Aerospace, Biomechanics, Defence, Energy, Consumer Goods, Civil Engineering and Oil & Gas.

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Key partner in Design Process Innovation