



 **ZENTECH INCORPORATED**
INNOVATIVE ENGINEERING SOLUTIONS

14800 St. Mary's Lane, Suite 270
Houston, Texas 77079 USA
Phone (281) 558-0290
Web www.zentech-usa.com
Email zentech@zentech-usa.com

Corporate Overview

BACKGROUND

Founded in 1978, Zentech is a Houston-based design and consulting engineering company providing services to the offshore oil and gas industry. Zentech presents itself as a small, efficient, and cost-effective group of professionals specializing in providing services to the marine, petroleum, and construction industries.

OPERATIONAL PHILOSOPHY

Fundamental to Zentech's organizational and operational philosophy is its commitment to staying on the cutting edge of knowledge. This is what keeps us and our clients ahead. We ensure this by continually upgrading existing competencies and creating new ones, at the organizational level, as well as the individual level. Zentech has in place specific mechanisms to turn individual and group expertise into organizational knowledge, and to draw business value from this knowledge by using it to upgrade and enhance organizational capabilities.

The core strength of Zentech is based on a strong culture of teamwork and professionalism, which encompasses respect for the individual, integrity, efficiency, trust, client focus, and a pursuit of excellence. Our values are non-negotiable. They are never to be compromised. For us, our values are our foundation. They help guide our actions and decisions.

VISION

Zentech shall be a professionally managed engineering consulting firm, committed to total customer satisfaction. Zentech employees shall be an innovative, entrepreneurial, and empowering team, consistently creating value and attaining global benchmarks. Zentech shall foster a culture of caring, trust, and continuous learning.

MISSION

Zentech shall pursue the creation of value for its clients, employees, and society at large.

QUALITY POLICY

At Zentech, we believe that quality is a culture, expressed in the way we interact with, and cater to, the needs of our clients and in the services we deliver. Zentech's quality assurance program is key to ensuring the integrity of our engineering solutions and allows us to provide our services to a wide variety of clients worldwide. Our projects have received approval from the following regulatory agencies: DnV, ABS, Lloyd's, BV, DeN, GL, NPD, NMD, USCG, and SOLAS. Our emphasis on quality is reflected in the following policies:

- Recognize and respect clients' right to receive quality services, on time, and within budget.
- Endeavor to exceed clients' expectations of competence, performance, delivery schedule, and value, thus becoming their preferred choice for repeat business.
- Strive constantly to improve upon our standards of quality, efficiency, and productivity.
- Achieve shared objectives in an atmosphere of fairness, integrity, dignity, and courtesy towards clients, employees, and competitors.

Zentech adheres to the highest standards of ethical business behavior, and our reputation for adhering to these standards is one of our most valuable assets. Our core values are used as a touchstone for our daily work.

We suggest, appreciate, and welcome the opportunity to meet and discuss your specific project needs and develop solutions for your consideration. Zentech's assistance is offered on a project-by-project basis, or as an overall engineering assistance program.

Engineering Capabilities

Zentech's main engineering disciplines include Structural Engineering, Naval Architecture and Marine Engineering, and Mechanical and Electrical Engineering. Our range of services include (but not limited to) the following:

STRUCTURAL ENGINEERING

- Analysis and design of fixed offshore platforms including jackets, topsides, helideck, accommodation modules etc.
- Reassessment of existing offshore oil platforms, jackup rigs, semisubmersibles, etc. and reserve strength assessment
- Jackup rig conversion and modifications including slot to cantilever conversion, extension of cantilevered rigs, increase in leg length, drilling package modifications, and other system upgrades
- Design and analysis of floating structures including semisubmersibles, TLPs, Spars, FPSOs, etc.
- Floating structures for offshore operations and construction, such as derrick / crane barges, pipelay barges, shear-leg lift vessel, multipurpose barges, etc.
- Load out and transportation analysis including design of grillage and sea fastening arrangements

NAVAL ARCHITECTURE AND MARINE ENGINEERING

- Stability Analyses (intact and damage)
- Mooring Analysis (static, quasi-static, dynamic, and fatigue)
- Motions Analysis (radiation-diffraction)
- Loading Conditions and Preload / Ballasting Procedures
- Longitudinal Strength
- Displacement and Payload Upgrades
- Tonnage and Freeboard Calculation
- Loadline Calculations
- Deadweight Survey and Inclining Experiments

MECHANICAL AND ELECTRICAL ENGINEERING

- Piping Systems
- Firefighting System
- Riser Tensioners Upgrade
- Skidding System Design and Modifications
- Mechanical Locking System
- HVAC System
- DP Systems
- Electrical System Design and Calculations
- Fire Detection Systems
- Instrumentation, etc.

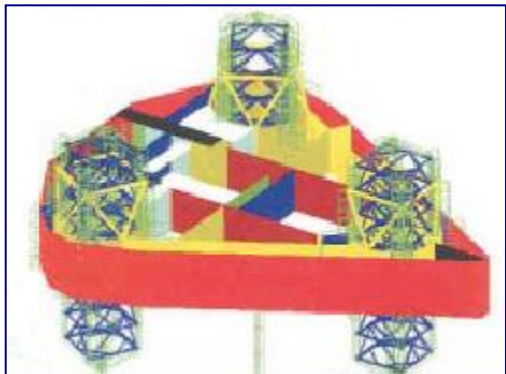
CAD SERVICES

Zentech offers CAD Services that produce specialized AutoCAD design, detailing, and fabrication drawings for marine, offshore, and commercial applications

NEW JACKUP RIG DESIGNS

Zentech has developed three new jackup rig designs: the **Z-210**, **R-550D**, and **Z-636**. These rigs are designed for superlative performance and easy construction. The R-550D and the Z-636 rigs include the patented "ZENLOCK" jacking system. For more information on any of our new rig designs, please contact Zentech.

Engineering Projects



Conversion from slot-type to cantilevered jackup drilling rigs:

Several dozen rigs have been studied and converted from slot-type to cantilevered jackup drilling rigs. Closing of the slot, skid rail and skid rail bulkhead design, design of pushups and hold downs.

Some of these projects were for the national drilling companies of various countries. These rigs were of various designs which include LeTourneau, Hitachi, Levingston, Bethlehem, F&G, and Baker Marine with different water depth capabilities.

Other jackup rig modifications:

Design of subbase and substructure areas, drill floor design and modifications, derrick and setback area modifications, raw water tower design, quarters modifications, helideck design and modifications, leg extensions and modifications for deeper water and harsher environments.

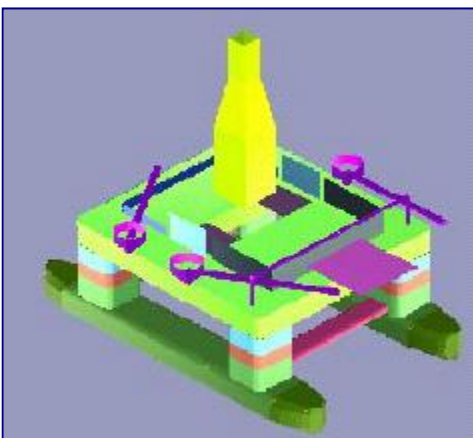
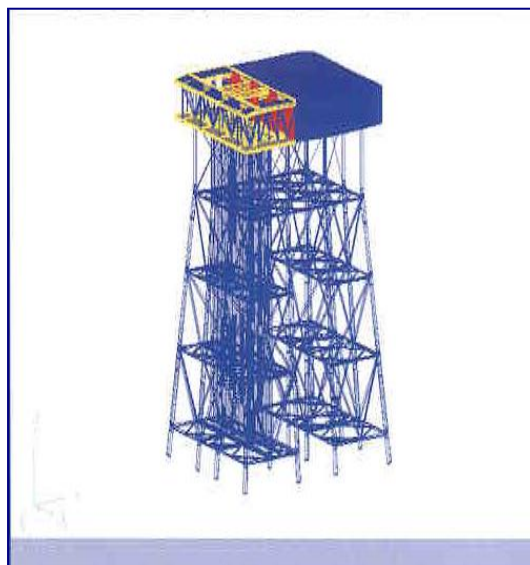
Reassessment and Life Extension for 26 Jackets in the Bay of Campeche including pushover analyses for wave and seismic loads, spectral fatigue analysis, and risk-based inspection planning.

Jacket Fatigue Analysis: Verify existing jacket for fatigue assessment for water depth of 148 ft.

Drilling Platform Jacket Analysis: Design & Drawings for 185 ft water depth.

Design of a Drilling Platform Jacket Structure in the GoM in 243 ft water depth.

Design of a Drilling Platform Jacket in 122 ft water depth.



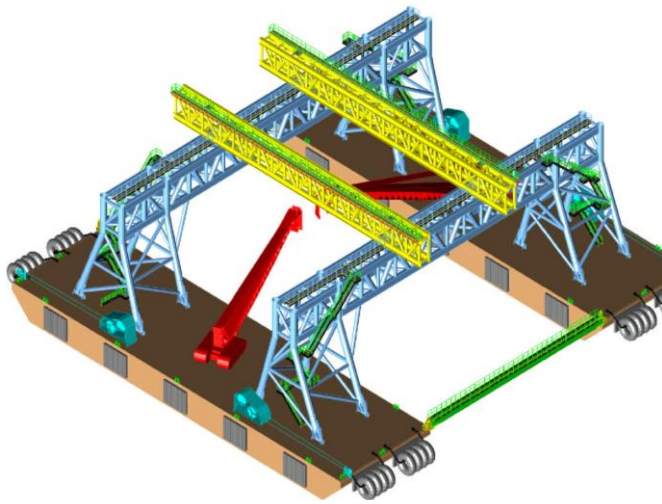
Conversion of an accommodation semi-submersible to a drilling unit: An accommodation semisubmersible was converted from 600 plus man accommodation unit to a 7500 ft operating water depth DP class III drilling rig. The rig has been operating successfully for BP in Gulf of Mexico.

Enhancing the water depth capability of Pentagon class semi-submersibles:

Modifications to the hull and systems to enable the semisubmersible to drill in deeper waters. P-Tank rack, lifeboat structure, pipe rack and riser rack area, and crane upgrade designs. Increased quarters capacity, enhanced variable load capacity.

Other semisubmersible rig modifications: Increased variable load capacities in transit, operating and/or survival modes. Complete global and local structural analysis, stability analysis, mooring analysis, and motions analysis. Foundation designs for riser tensioners, APV bottles, P-Tanks, mooring winches, crane column, and crane boom rest. Lifeboat support structure and P-Tank support design. Design and analysis of riser rack and pipe rack areas, drill floor, derrick, and setback areas.

Engineering Projects

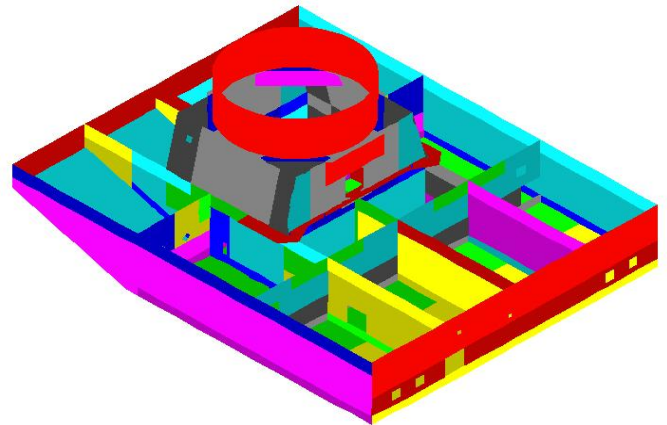


Catamaran Barge: Designed for various applications with up to 4 lifting lugs on the cross beams. Capacities up to 4000 Tons. Design and analysis of cross beams and the barges. Structural analysis, stability and ballasting, motions analysis, and mooring analysis.

Heavy Lift Crane Barge: Conversion of a dumb barge into a derrick barge with lifting capacity of 1600 Tons in revolving mode. Structural and Naval Architectural studies, Electrical and Mechanical systems design. Design of 102 man quarters.

Derrick/Pipelay Barge: On-site supervision of upgrades and conversion from jetting barge to a jetting/pipe-lay barge. This vessel is currently in operation in the GoM.

Shear-Leg Crane Barge: Used for bridge construction with a capacity to lift 2000 Tons at 130' radius. Lifting scenarios and ballasting calculations, boom structural analysis, and design of the new barge.



Harsh Environment Mooring System: A 32-point mooring system design for bridge caissons which were built in-situ, under the influence of up to 8 knot tidal current and 13 feet tidal variations. Assisted in model testing, developing the instrumentation system for real-time measurements, developed real-time mooring and motions monitoring system, and assisted in the field during the deployment of the mooring system.



SBIR: Improved Life Prediction of Turbine Engine Components, Phase I and II – included extension of 3D crack propagation analysis program based on FEM to include modeling of different types of cracks, effects of residual stress including contact effects, retardation, load spectrum, etc. The project was done under the supervision of US Air Force.

Deadweight Surveys and Incline Experiments: Performed deadweight surveys and incline experiments on several dozen vessels including mat-supported rigs, jackup rigs, barges, and semisubmersibles. Prepared survey procedure and performed the tests and provided submittals to classification societies for approval of lightship values.

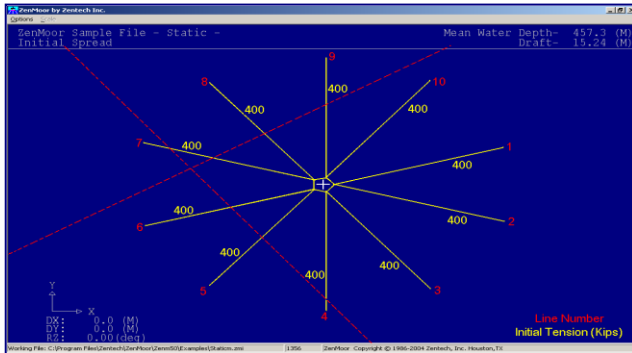
Construction Supervision and On-site Assistance: Supervision and assistance provided for new builds, conversions and modifications of drilling rigs, production vessels, derrick/pipe-lay barges, offshore construction vessels, offshore support vessels, etc.

Engineering Software

The software development group at Zentech develops and markets the following state-of-the-art commercial software, primarily for Naval Architectural applications.

ZENMOOR MOORING ANALYSIS SOFTWARE FOR FLOATING VESSELS

ZenMoor is a Powerful State-of-the-Art, Windows-based program for Mooring Design and Analysis of Semisubmersibles, FPSOs, Spars, Barges, and other Floating Production Systems.

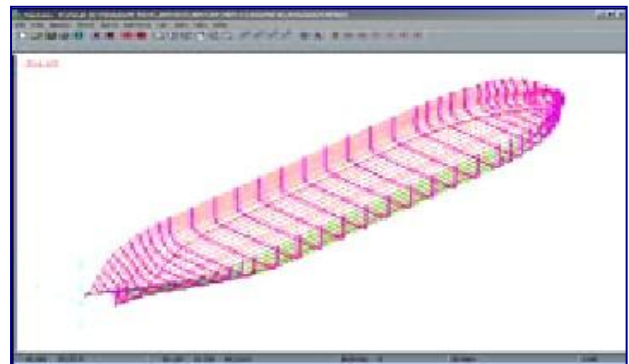


- Static, Quasi-Static and Dynamic Analysis
- Mooring Line Dynamic Analysis in Frequency and Time Domain
- Fatigue Analysis of Mooring Lines
- Vessel Relocation Analysis and Transient Motion Analysis
- Display of Pipelines, Pipeline Clearance, and Buoy Immersion Distances
- Database of Chain, Wire, and Anchor from Manufacturers
- Choice of Wave and Wind Spectra

NEPTUNE WAVE RADIATION AND DIFFRACTION ANALYSIS FOR LARGE FLOATING BODIES

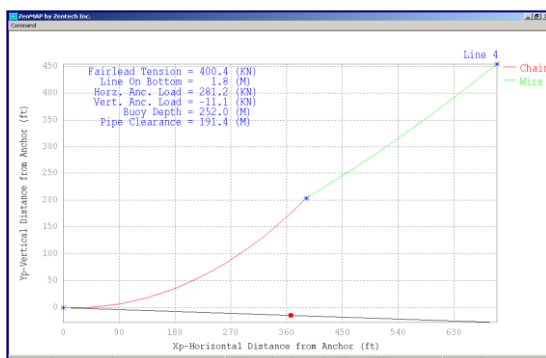
Neptune analyzes structures ranging from a simple barge or caisson to a complex semisubmersible, TLP, or Floating Production System. Neptune employs a 3D constant panel radiation and diffraction analysis procedure to compute the hydrodynamic coefficients, motion RAOs, and wave drift loads.

- Graphical Interface for Model Generation
- Computation of Hydrodynamic Coefficients and Wave Loads
- Wave Frequency Motion Response and RAOs
- Mean Wave Drift Forces and Static Offset
- Slowly Varying Wave-Drift Forces and Damping Spectrum
- Regular and Random Waves
- Load Mapping to Structural Beam and Plate Elements



ZENMAP ONBOARD POSITIONING AND MOORING ADVISORY SOFTWARE

ZenMAP is a powerful State-of-the-art, rig-specific Mooring Advisory Program for use on Offshore Drilling Vessels, Floating Production Systems, and other Moored Vessels.

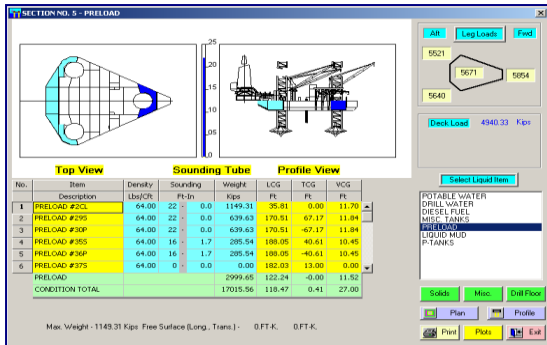


- Rig specific Mooring Advisory Program for all floating vessels
- Considers Influence of Thrusters, usage of Buoys and Clump Weights, Adding and Deleting Line Segments, Effect of Bottom Slope, etc.
- Good Graphic displays of the results along with line spread and profile
- Complete mooring analysis output parameters like line tension, vessel offset, pipeline clearance, anchor positions, relocation distance, etc., in graphic and text modes
- Static, Quasi-Static, and line break Transient Analysis

Engineering Software

LOSJACK ONBOARD LOAD AND STABILITY CALCULATOR FOR JACKUP RIGS

Part of Zentech's Suite of Load and Stability Calculating Programs, LosJack is an interactive, menu-driven, rig-specific software used in data management and loading calculations in the day-to-day operations of Jackup Rigs.

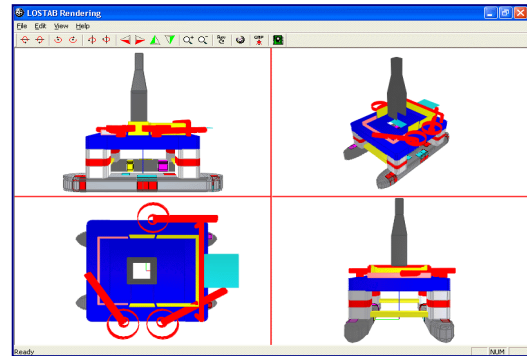


- Calculation of Liquid Weights and CGs from Tank Tables
- Calculation of Free Surface Moments in Each Tank and for the Complete Vessel
- Damaged Stability Calculations
- Leg Load and Soil Pressure Calculations
- Preload Schedule with Punch Through Calculations
- Comparison of Leg Penetration with Soil Properties
- Load Equalization Calculations
- Graphical Display of Rig, Weights, and Tanks

LOSEMI ONBOARD LOAD AND STABILITY CALCULATOR FOR SEMISUBMERSIBLES

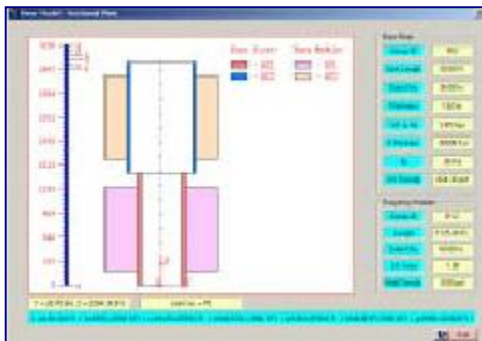
Part of Zentech's Suite of Load and Stability Calculator Programs, LoSemi is an interactive, menu-driven, rig-specific software used in data management and loading calculations in the day-to-day operations of Semisubmersibles.

- Calculation of Liquid Weights and CGs from Tank Tables
- Calculation of Free Surface Moments in Each Tank and for the Complete Vessel
- Damaged Stability Calculations
- Interface with Mooring Advisory Software ZenMAP
- Large Angle Stability Calculations
- Performs Ballasting and Deballasting Procedures and Load Equalization Calculations
- Graphical Display of Rig, Weights, and Tanks



Z-RISER RIGID RISER ANALYSIS

Z-Riser is a 3D finite element analysis program for static, frequency domain, and time domain analysis of rigid drilling risers. Analysis can be performed on a riser in connected or disconnected configuration.



- Capable of geometric non-linear analysis with large displacements
- Finite elements include 3D Beam elements, Flex/Ball joints, Point Mass elements
- API RP 16Q code checks
- Displacement history for vessel motion and static offset
- Profile, Envelope, Dynamic History, Static Parametric Study, and Configuration plots available
- Nodal and Element Level variables
- Output includes top angle, bottom angle, bottom tension, Max. Von-Mises stress, Max. combined stress, and Slip Joint travel

For more information about the above programs, please contact Zentech.

For our consulting engineering work, Zentech uses all the above programs and Structural Engineering Analysis and Design Program **StruCAD*3D** and Stability Analysis Program **StabCAD**.

Partial Client List

GlobalSantaFe
Transocean Offshore
R. J. Brown & Associates
Nabors Offshore Corporation
Rowan Companies
R & B Falcon
Atwood Oceanics
Diamond Offshore Drilling
Cliffs Drilling Company
Shell Oil Company
Noble Drilling Corporation
ENSCO
BP Amoco
Brown & Root (U.K.)
Friede Goldman Offshore
Brown & Root (U.S.A.)
BHP Engineering & Construction
Sedco - Forex
Maersk Drilling
Chiles Offshore
Chevron Research & Technology
Phillips Petroleum
Conoco, Inc.
Paragon Engineering
Amoco
Transocean A.S.
Mobil Oil Research & Development
Oceaneering Prod. Systems
Technip Rauma Offshore OY
Oil & Natural Gas Corporation
Falcon Drilling Co., Inc.
Lamprell

Kerr-Mcgee Oil & Gas Onshore LLC
Pride International Inc.
Parker Drilling
Chiles Offshore LLC
Mitsubishi Heavy Industries
Exxon/Mobil Company
Freide Goldman
Willbros Engineers Inc.
Letourneau, Inc.
Massman Construction Co.
OASES Offshore, Inc.
Lloyd's Register Of Shipping
Schlumberger Technical Services, Inc.
Aban Lloyd Chiles Offshore Ltd.
Great Eastern Shipping Co. Ltd.
Damat Worley Engineering
Jurong Shipyard
Hyundai Mipo Dockyard Co., Ltd.
Aramco Services Company
Petro-Tech Peruana S.A.
National Drilling Company
Damus Limited
J. Ray McDermott Engineering, LLC
Pemex
Murphy Oil
Fluor Daniel, Inc.
J.P. Kenny
Dominion Exploration and Production
Tacoma Narrows Constructors
Kiewit Engineering Company
Kiewit / FCI / Manson - a Joint Venture

CONTACT US

Zentech, Inc.

14800 St. Mary's Lane, Suite 270
Houston, Texas 77079 USA
Tel: (281) 558-0290
Fax: (281) 558-0295
Email: zentech@zentech-usa.com

Zentech India Offshore & Marine Engineering Pvt. Ltd.

103/104 Building #5, Sector-2
Millennium Business Park, Mahape
Navi Mumbai 400701, INDIA
Tel: 91-22-27781416
Fax: 91-22-27781410
Email: zentech@zentech-usa.com

Zentech do Brasil Servicos Técnicos Ltda.

Av. Rio Branco 37, Gr. 1403, Rio de Janeiro,
RJ 20090-003
Tel: +55-21 2223-3310
Fax: +55-21 2283-3621
www.zentechbrasil.com
jracook@zentechbrasil.com

Zentech Mexico

Calle Pedro de Alvarado #68
Colonia Lomas de Cortes
Cuernavaca, Morelos
C.P. 62240, MEXICO
Tel: 52-777-101-8887
Email: zentech@zentech-usa.com