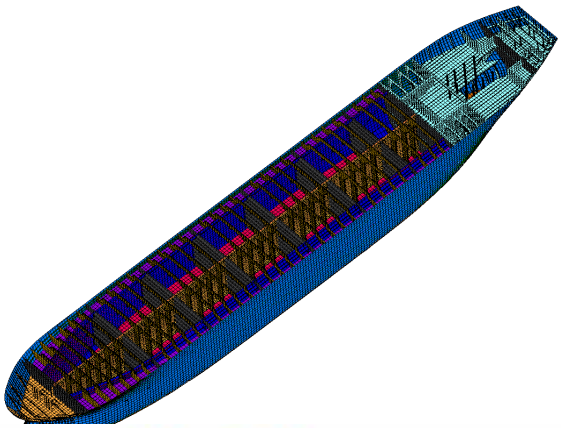
Zebec
MARINE CONSULTANTS & SERVICES

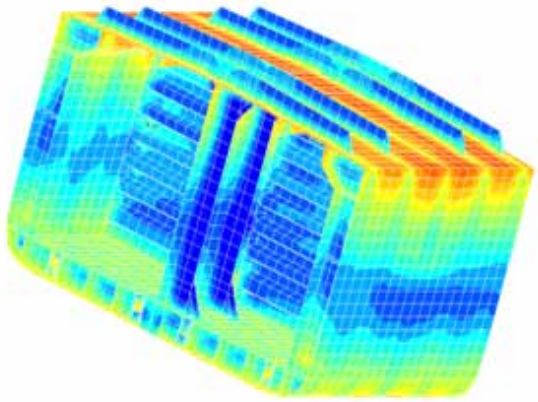
FPSO – FSRU – FLNG

DESIGN SERVICES

As the global industrialization and emerging consumption requirements drives the energy demands to a global surge, taking exploration and production operations to new horizons of terrain, climate and operabilities, the use of FPSO's present to us the most effective and expedient way to achieve the processing, storage and offloading of offshore oil and gas. With the use of FPSO's, productions have moved to the remotest and smallest of fields evading the constraints and high expenses posed by the conventional fixed systems. With the various advantages presented by these systems, their global demand is on a rise and is expected to double this decade.

Zebec has been involved in many stages of FPSO development and conversion projects. Our Naval Architects & Engineers have extensive design and operation experiences from various offshore development projects. We utilize a wide range of software systems, from structural FEM, hydrodynamic, mooring, stability modules to 3D plant, layout and piping CAD solutions. Our in-depth knowledge of marine and vessel system design combined with structural and station keeping experience offers a unique competence for FPSO operators.





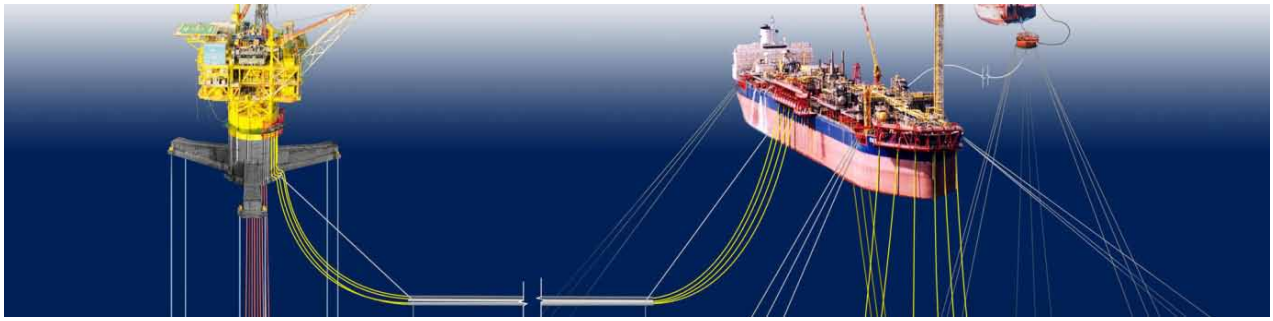
Some of the studies that can be conducted include but are not limited to:

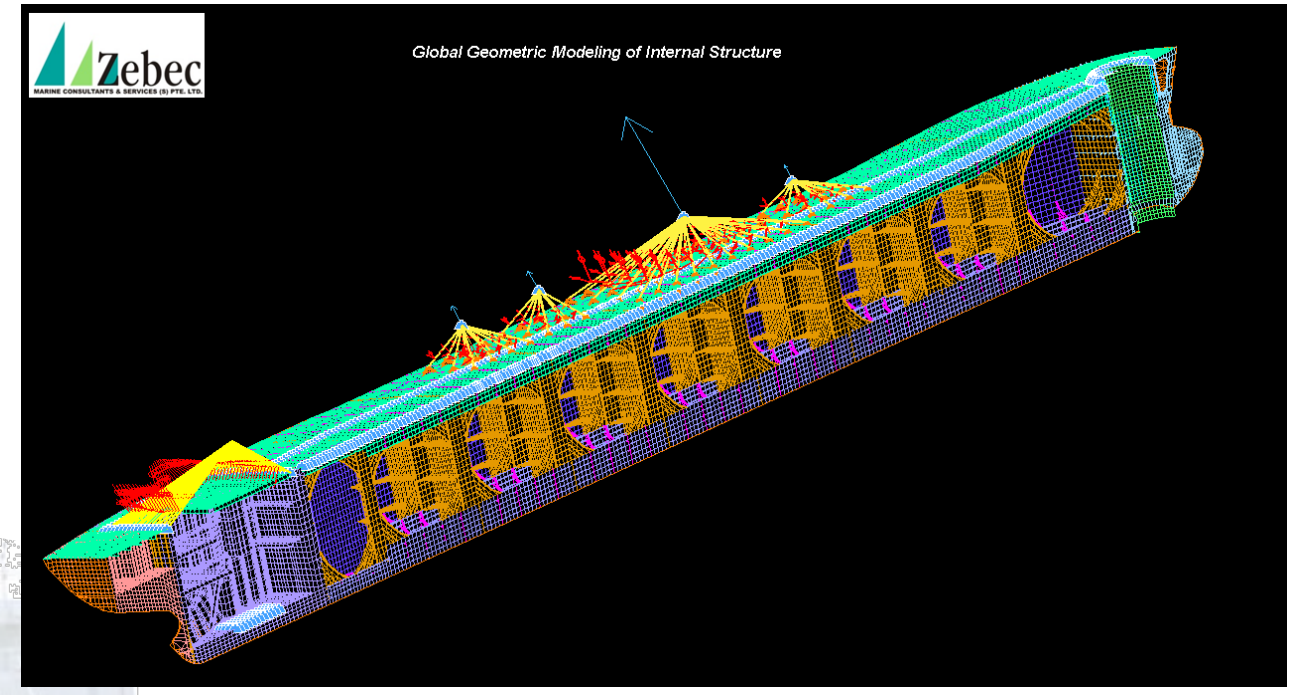
- Conceptual design and feasibility studies
- Pre-FEED studies and FEED studies
- Preparation of outline technical specifications
- Preparation of preliminary general arrangement plan
- Preliminary rule calculations to ensure class compliance and longitudinal strength analysis
- Equipment selection, machinery and electrical design
- Complete 3D production model for pipe systems
- Marine system engineering
- Instrumentation and control engineering for marine system
- Tandem offloading analysis
- Global FEM structural strength and fatigue analysis of FPSO (conversion or new design)
- Two hold or Three hold structural analysis

Sloshing excitation for liquids inside tanks can be assessed which can be used for studying behavior of the vessel in various loading conditions. The use of anti-roll tanks can be studied and recommended.

The modeling also takes into account the underwater hull shape of the vessel, the loading condition, and the vessels speed and heading, which will assist in optimization of the floating body design.

- Asset integrity management of FPSO – Early detection of potential problem areas due to corrosion, strength, fatigue and buckling
- Structural strength assessment of topside modules supporting frame structures including stool structures
- Coupled time domain dynamic spread/turret mooring analysis of FPSO for strength and fatigue for both intact/damage conditions
- Local FEM structural analysis for mooring supporting equipment, fairleads, winches etc.
- Local FEM structural analysis for any structure modifications or strength integrity checks for hull foundations (crane, generators or heavy equipment etc.)
- Quantitative risk assessment
- Stability and hydrodynamic assessments including the downtime, bow slamming and greenwater analysis
- Global and local vibration analysis to check the resonance of hull superstructure/deck panels/machineries





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