



aqua engineering

System engineering and design



NAVAL ENGINEERING AND MARINE OPERATION

Naval Analyses

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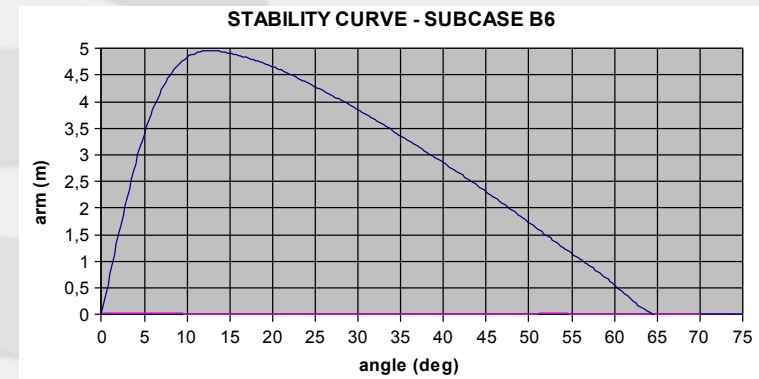
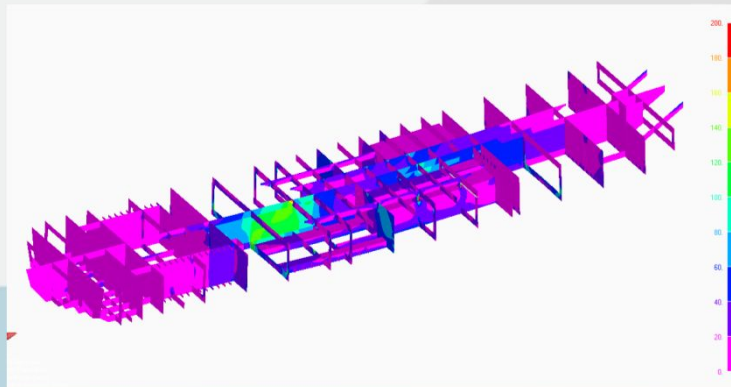
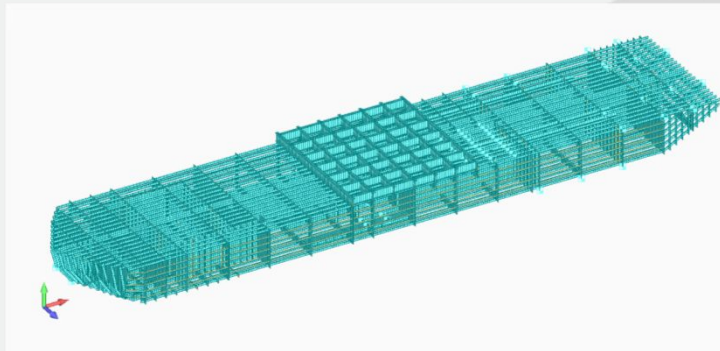
- Hydrostatic computations
- Stability analyses
- Hull engineering and strength analyses
- Sea keeping analyses
- Mooring systems design (ropes, chains, anchors and ancillary equipment)
- Dynamic analyses of compliant and floating structures
- Hydrodynamic loads on fixed and floating structures
- Linear and non-linear dynamics (in frequency and time domain)
- Multi-body dynamics (mutually bound bodies)
- Hoses, risers, pipelines and flexible lines static and dynamic behavior

Hydrostatic Analyses

- Ballasting plans
- Stability analyses
- Strength analyses

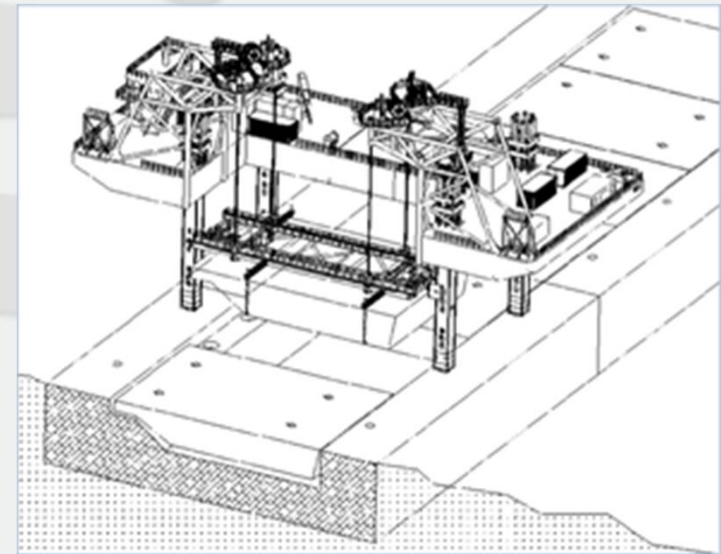
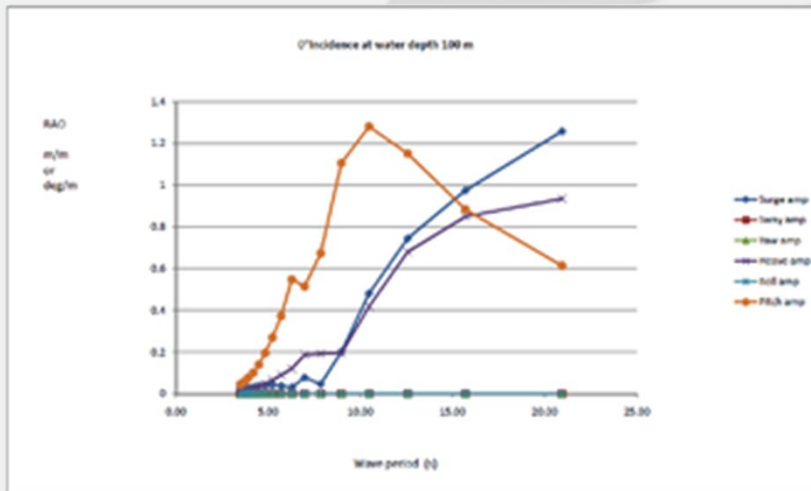
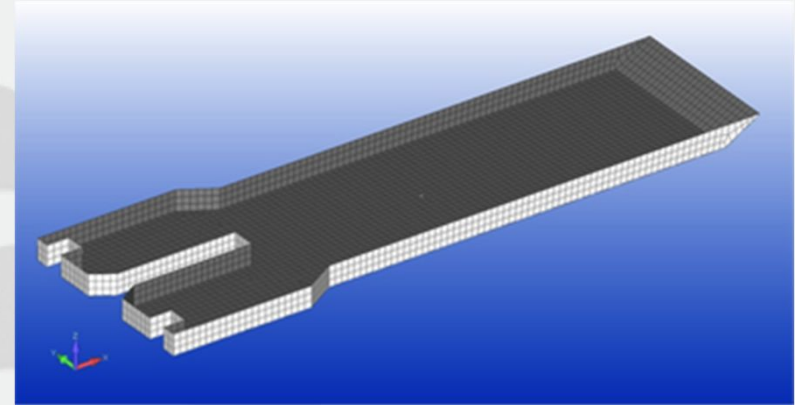
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251	1754	2005		2005	2005		1203		1729	943	
	2633			1947	1947		1168			912	
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251	2633			1947	1947		1168			912	
	1754	2005		2005	2005		1203		1729	943	
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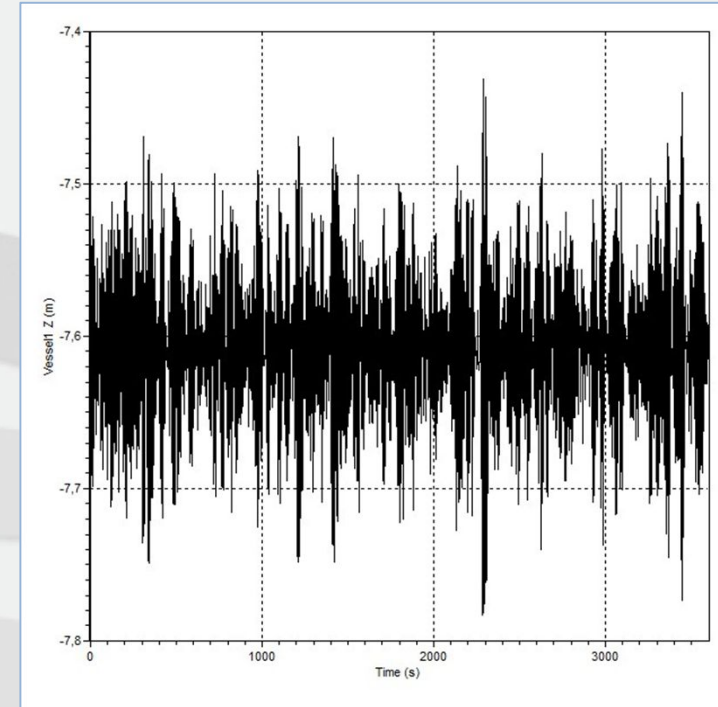
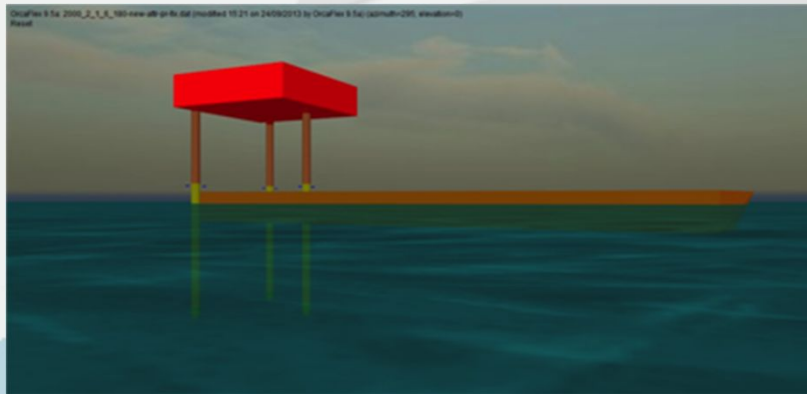
Vessel dynamics

- Hull modelling
- Computation of RAO's



Vessel dynamics

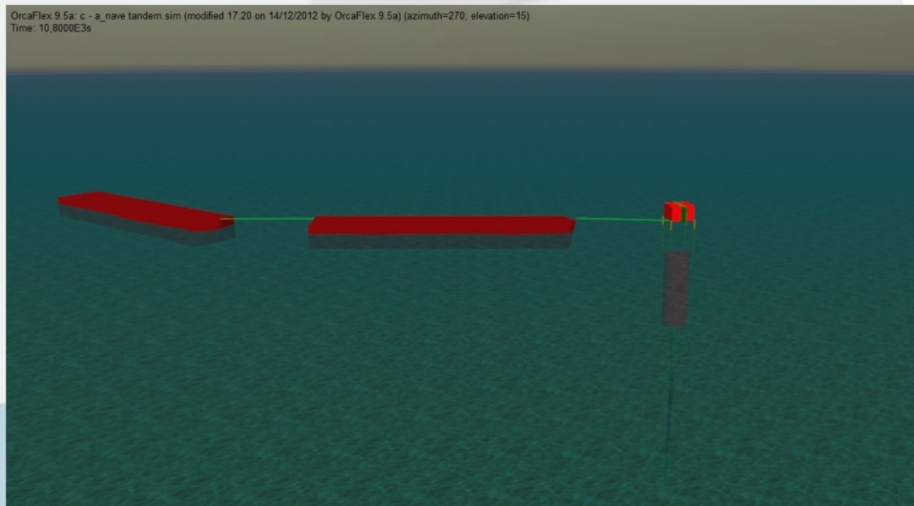
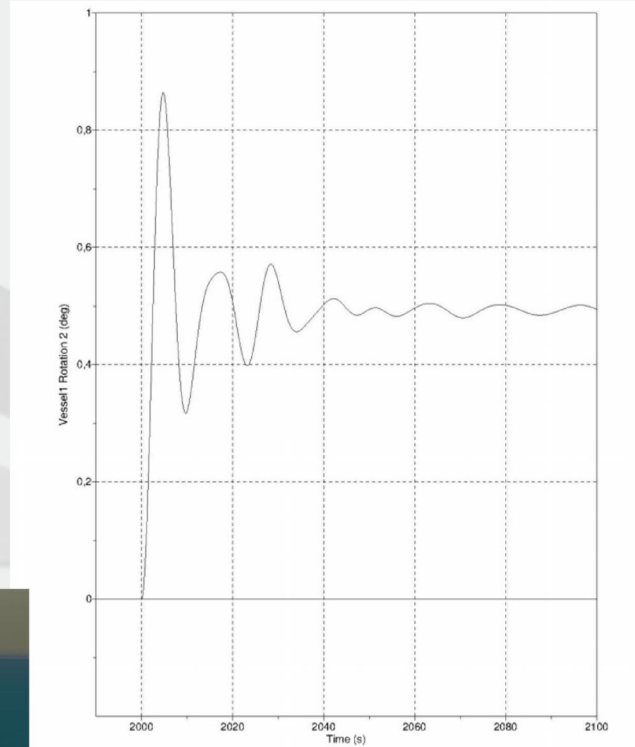
- Time domain dynamic analyses
 - regular seas
 - irregular seas
 - extrapolation of maxima
- Single body analysis
 - dynamic response
 - interaction with adjacent bodies



Removal of platforms

Vessel dynamics

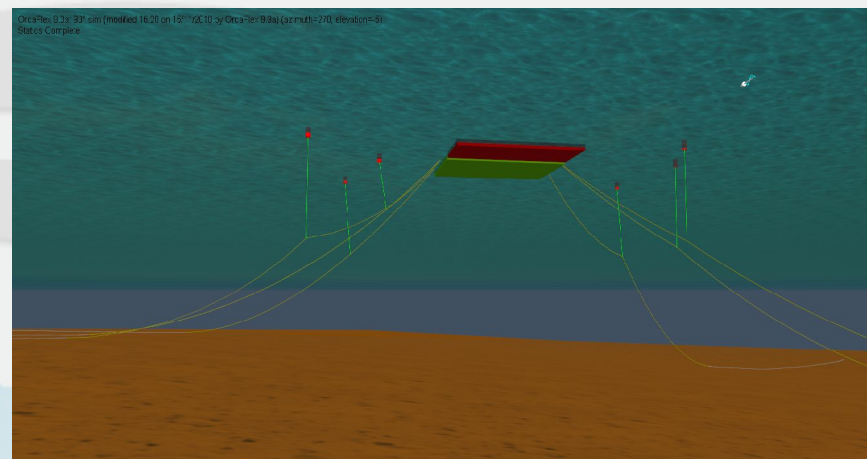
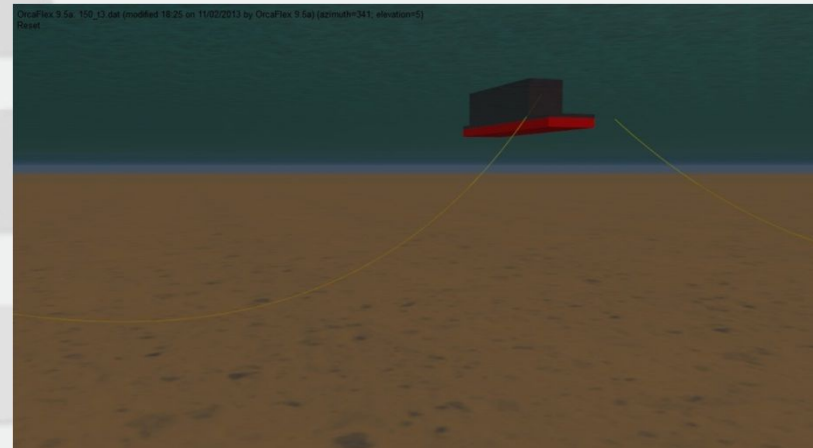
- **Multi-body analyses**
 - Coupled dynamics
 - Modelling of more vessel moored together
 - Design of mooring hawsers
- **Transient analyses**
 - Quick ballasting/deballasting analyses
 - Sudden load changes modelling and analyses



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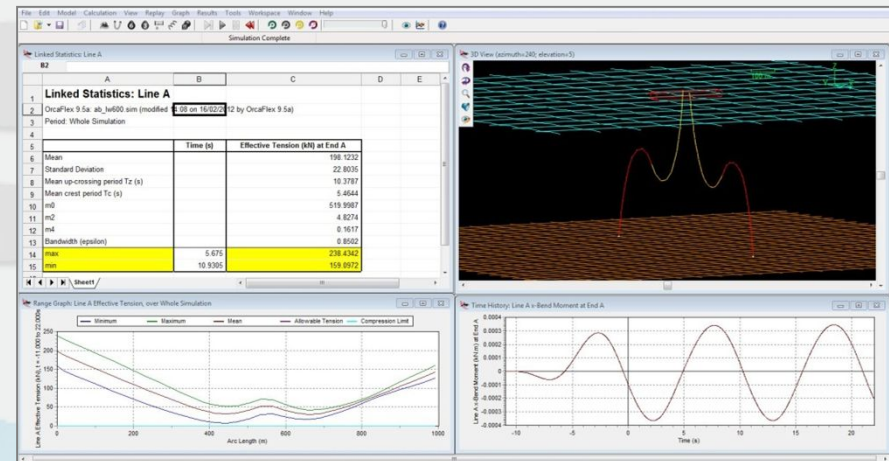
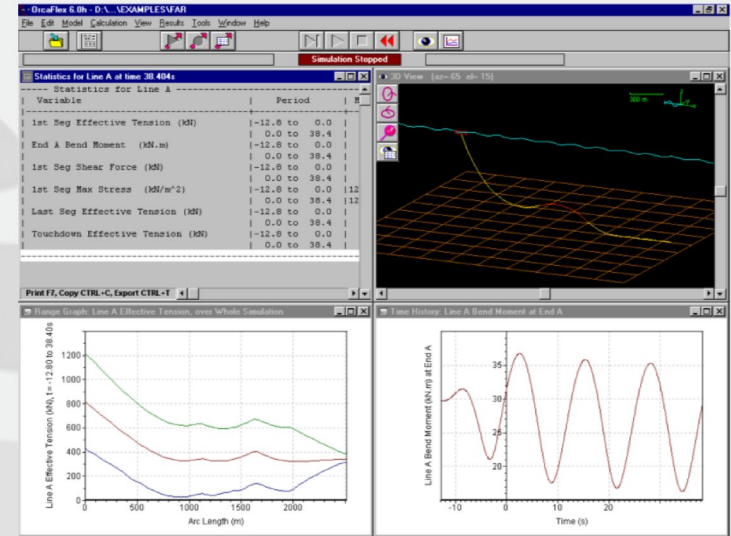
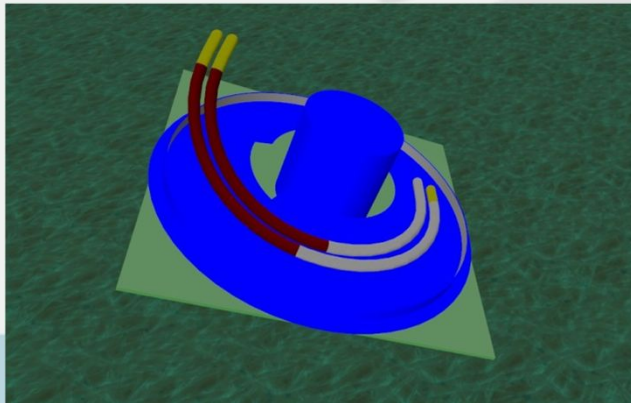
Mooring systems

- Moored system dynamics
- Sizing of mooring pattern and legs
 - ❑ Spread mooring
 - ❑ Turret (weather vaning) mooring
 - ❑ Structural interfaces design



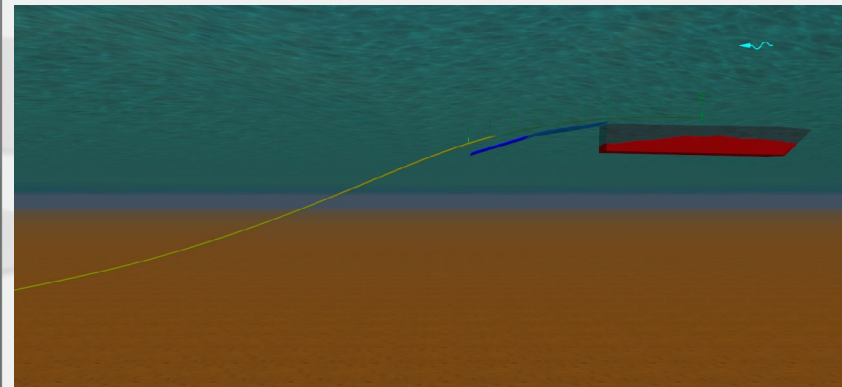
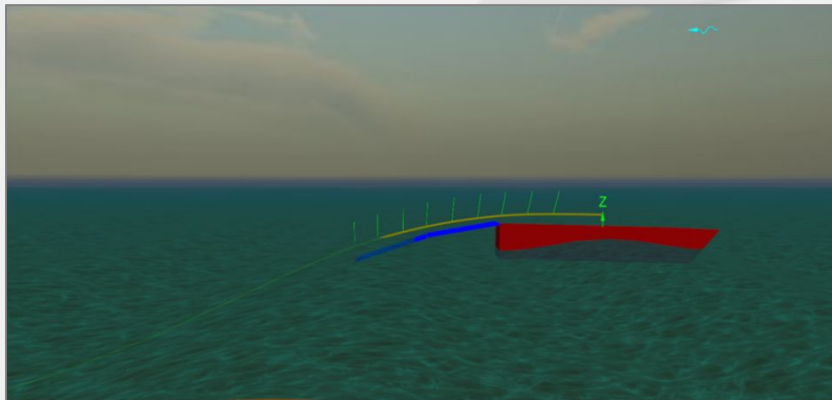
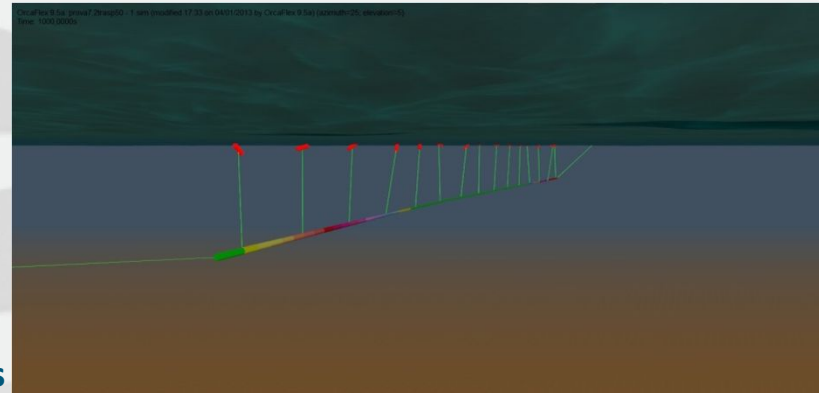
Risers and flexibles design

- Risers dynamic analysis
 - ❑ Definition of optimal shape
 - ❑ Vessel/risers dynamic coupled behaviour
 - ❑ Design of end sections (bend restrictors, etc.)
- Spools analysis
 - ❑ Deployment and routing
- Flexibles analyses
 - ❑ Hose string behaviour and strength



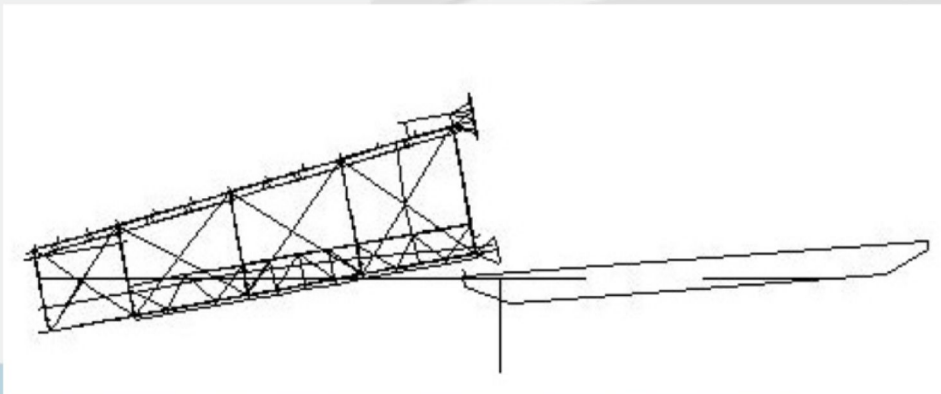
Pipelines

- Pipeline analyses – handling and towing operations
- Pipe laying studies
 - ❑ Modelling of pipe and stinger
 - ❑ Evaluation of static configuration
 - ❑ Computation of dynamics and pipe stress
 - ❑ Post trenching analysis



Marine operations

- **Jacket launch**
 - ❑ Hydrodynamic model of jacket of barges
 - ❑ Computation of launch trajectory and interaction loads
 - ❑ Structural model and analysis
- **Transportation analyses**
 - ❑ Ballast plans
 - ❑ Dynamic behaviour modelling and inertial forces computations
 - ❑ Deterministic and stochastic structural analyses



Marine operations

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- Structures deployment
 - Hydrodynamic model of the lifted objects
 - Modelling of lifting arrangement
 - Dynamic during lowering into water (with/without motion compensators)
 - Sling slack analyses

- Mating analyses

