

# SOFTWARES

**PRINCIPIA develops specific dedicated products that capitalizes know-how and R&D results. These products are used internally to perform projects and also distributed with associated services such as training, support, expertise, maintenance and specific developments.**

## **NSO Fastrudl / ISYMOST™**

Structural Analysis product specialized for Offshore and Marine design : topside module, FPSO hull, jackets, ...

### **Offshore**

- Wave Loads generator (Morison).
- Code checks for beams and plated structure
- Fatigue analysis (deterministic and spectral).
- Detailed stress Concentration Factors (Efthymiou, Kuang, Lloyds, DNV, etc.).
- Soil/Structure interaction (PY and TZ curves)
- Dynamic simulations
- Fluid / Structure coupling

### **Float & Launch**

- Dynamic launching of jackets.
- Equilibrium, stability analysis, upending
- Structural analysis at any time step.

*ISYMOST is a PRINCIPIA product*

*NSO Fastrudl is a PRINCIPIA/BV & Strusim product*

## **DEEPLINES™**

Global Analysis of Risers, Moorings and Flowlines

- Flexible risers, umbilicals, and floating hoses configurations,
- Rigid (SCR) and drilling risers,
- Riser towers, bundles, pipe-in-pipe (PIP)
- Mooring lines (catenary, taut, synthetic,..) and multi-bodies offshore systems,
- Pipeline and flowline laying and stability,
- Towed systems,
- Subsea equipments installation.

*DEEPLINES™ is certified by BUREAU VERITAS*

*DEEPLINES™ is a PRINCIPIA/IFP product*

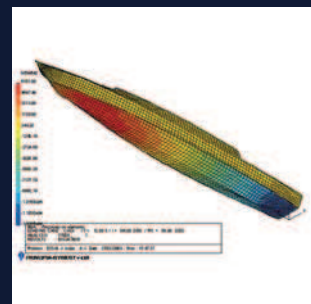
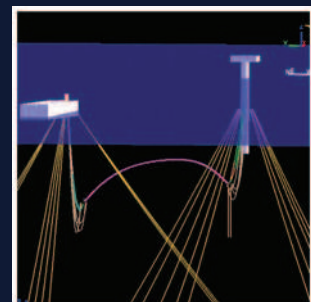
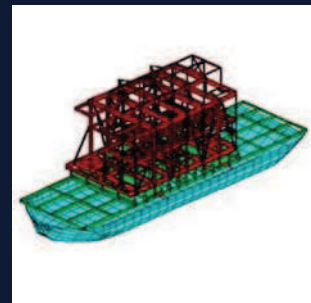
## **DIODORE™**

Versatile Multibodies hydrodynamics software (Diffraction/Radiation)

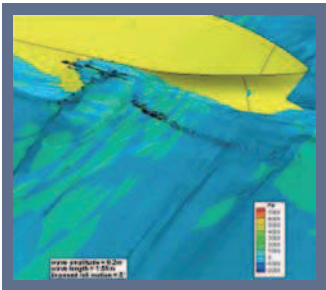
- Sea keeping, Mooring
- Strength, loads & F.E.M. coupling
- Stability, Marine operation (offloading, deckmating)

Analysed structures can be FPSO's, LNG Carrier, Tanker, CALM Buoy, Frigates and military vessels, Tugs...

*DIODORE™ is a PRINCIPIA product*



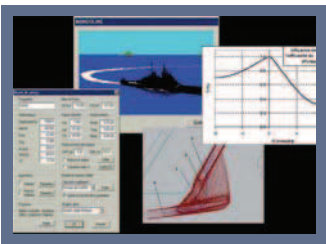
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### **EOLE™** *Fluids dynamics (CFD)*

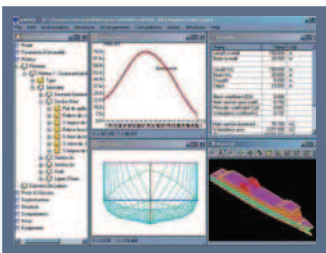
- Multi-phase flows
- VOF free surface model
- Incompressible and compressible flows (high and low mach)
- Cavitation model
- Fluid/Solid thermal coupling
- Heat transfer condensation model
- Rigid structure/fluid coupling

*EOLE is coupled with ABAQUS™, DEEPLINES™ and LS-DYNA™*



### **MANDOLINE™** *Ship manoeuvring simulation*

- Manoeuvrability standard tests
- Complex manoeuvring



### **AVPRO™** *Ship early design*

AVPRO is an integrated software for the Naval Architect, which allows going through the complete design loop very efficiently, and gives the possibility to investigate several designs during the very early stages of the design process.



### **ODIGO™** *Crowd motion simulation*

- Emergency scenario
- Design optimisation according to crowd motion



### **START™** *Unsteady aerodynamic*

Pre-design tool for the estimation of unsteady aerodynamic effects on trains and structures.

*All these softwares are Principia products*

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