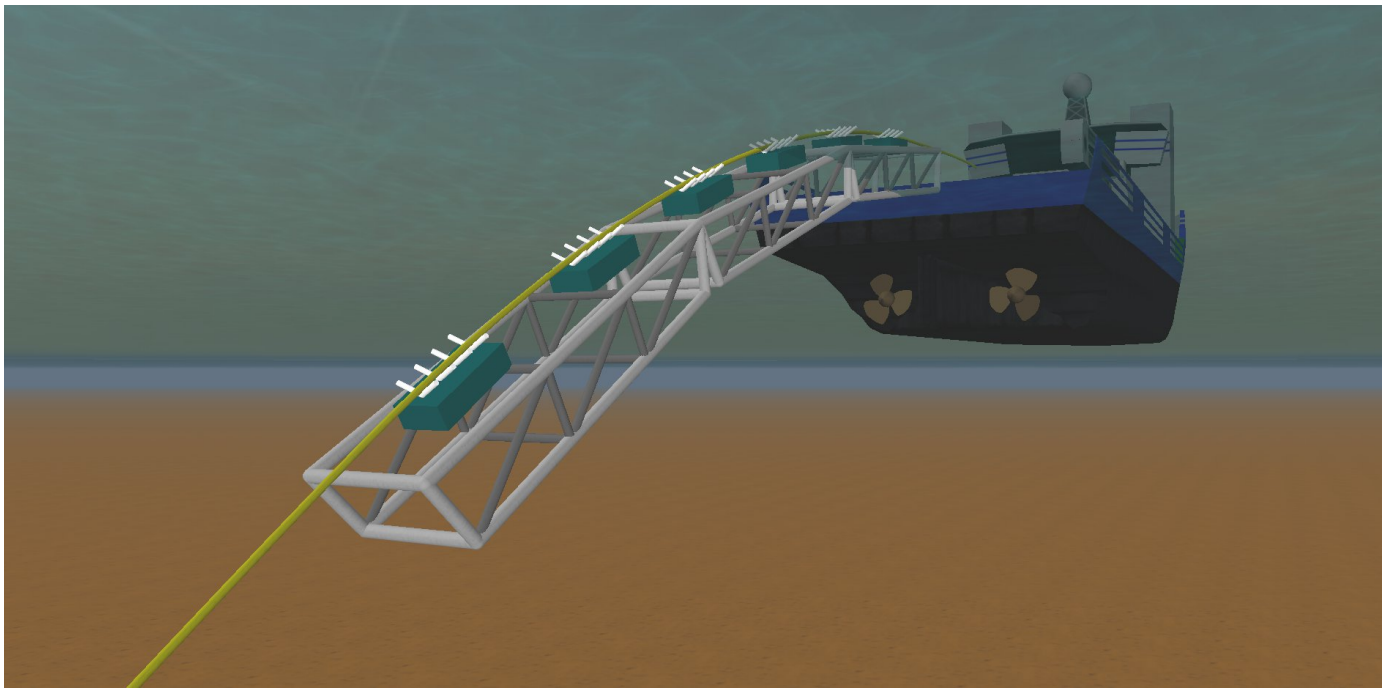
orcaflex for pipelay



OrcaFlex is a general purpose dynamic analysis software program suitable for a wide range of global dynamic analysis applications. Its user interface, functionality, productivity features and wide range of applications, along with very active program development and technical support, make it the leading option in its peer group.

It has been further enhanced over recent years to provide an improved user interface and workflow for pipelay applications.

Pipelay features include

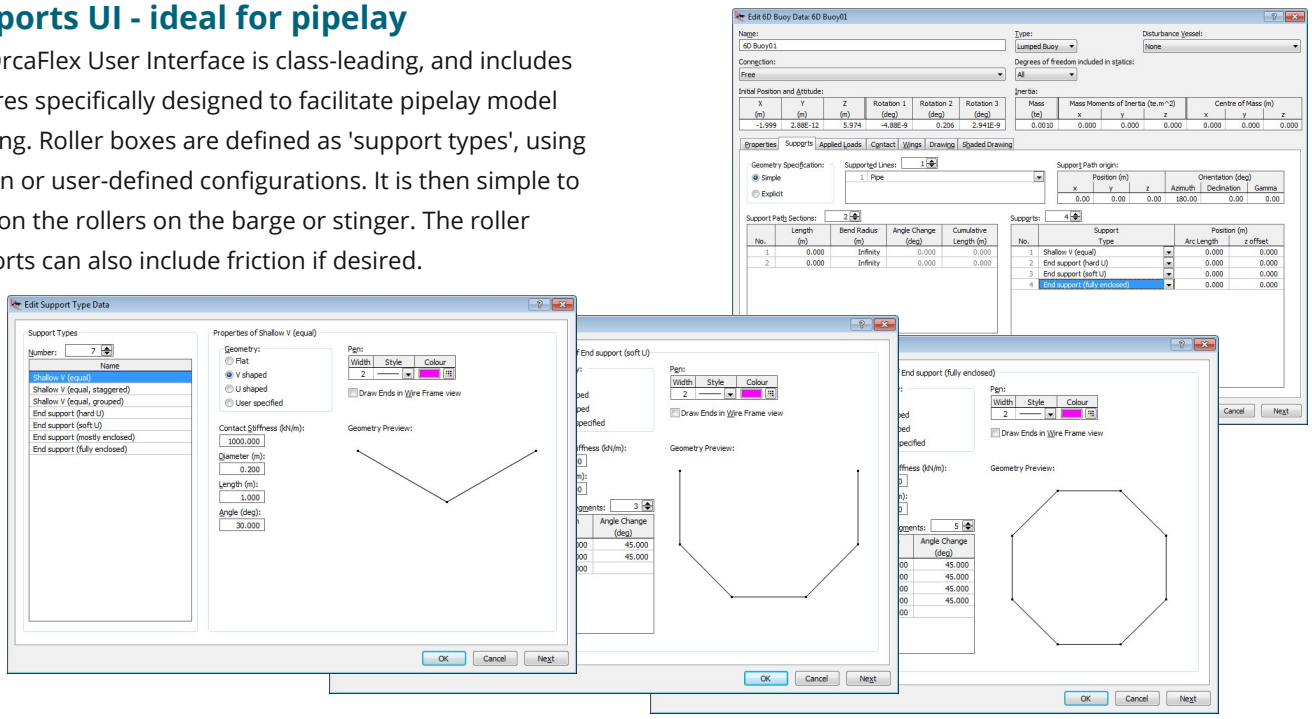
- Dedicated Supports User Interface
  - perfect for modelling rollers on stingers
- Fully interactive UI
  - ideal for visualisation and checking
- Built-in code checks
  - API RP 1111, DNV OS F101 & F102, PD 8010
- Multi-directional RAOs
- Robust contact model
  - ideal for intermittent pipe-roller contact
- Non-linear bend stiffness
  - with or without hysteresis
- Full environment specification
- Coatings and linings easily defined
  - additional bending stiffness can be included
- Arbitrary support configurations
- Lay table automation
  - using Python or Excel
- Excellent agreement between OrcaFlex and OFFPIPE
- Equivalent lines, explicit pipe-in-pipe and / or piggybacks
- Fully integrated fatigue analysis

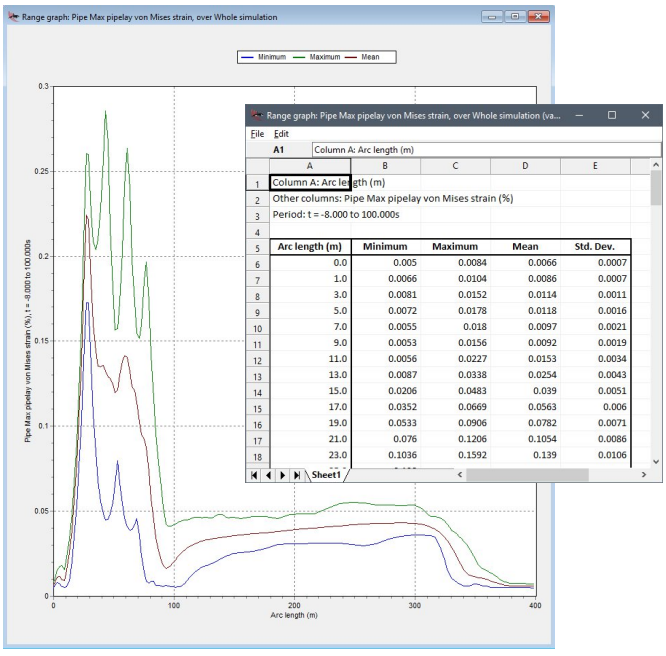
Contents

OrcaFlex pipelay functionality

Supports UI - ideal for pipelay

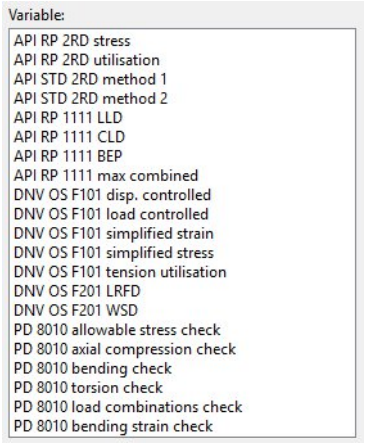
The OrcaFlex User Interface is class-leading, and includes features specifically designed to facilitate pipelay model building. Roller boxes are defined as 'support types', using built-in or user-defined configurations. It is then simple to position the rollers on the barge or stinger. The roller supports can also include friction if desired.





Code checks

Several code check results are built into OrcaFlex and are easily the simplest way to perform standard industry code checks.



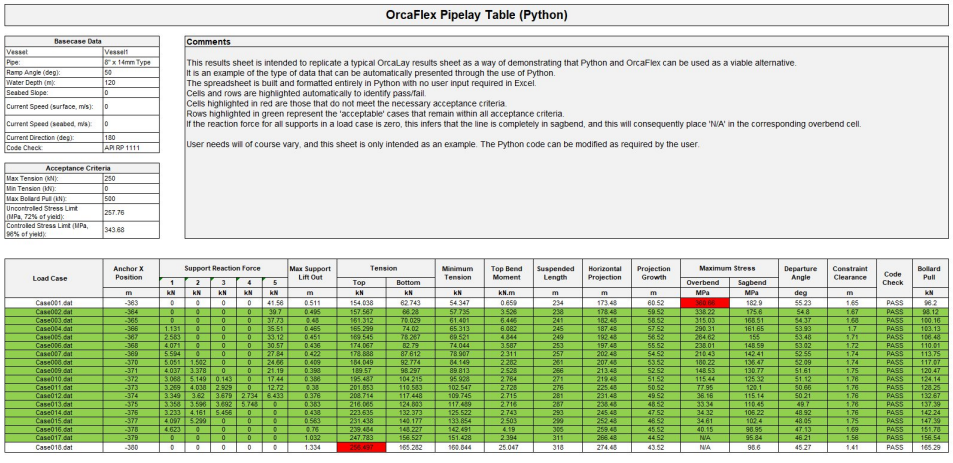
The usual OrcaFlex presentation of graphs and values now includes results from pipelay code checks.

Lay tables

Standard automation facilities built-in to OrcaFlex mean that lay tables are easily generated. There are two approaches:

- OrcaFlex spreadsheet
- Python scripting

Examples of each are available as part of our standard examples set.



Comparison with OFFPIPE

The OrcaFlex analysis used 10 elements between supports.

For Case A (700m water depth), OFFPIPE used its default of 1 element between supports.

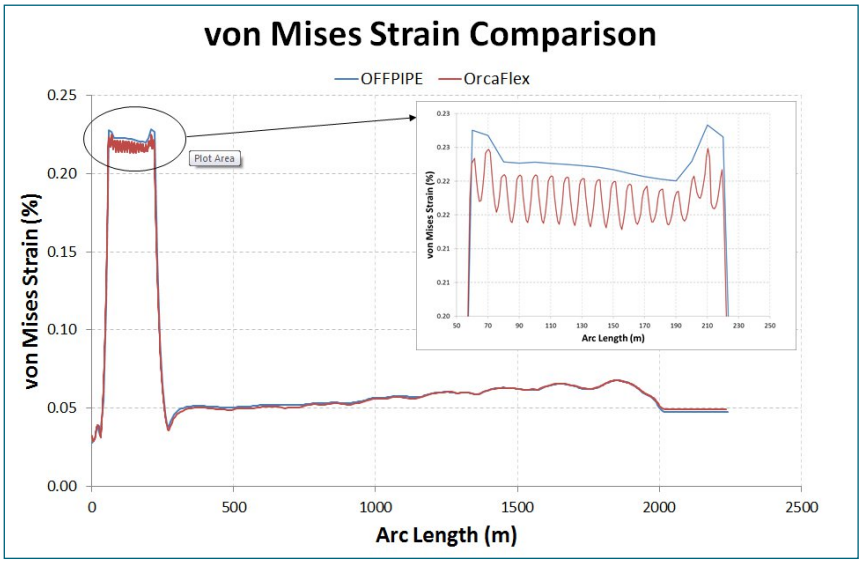
For Case B (150m water depth), OFFPIPE used 16 elements between supports.

Initially differences in results were found. Eventually these differences were found to be caused by:

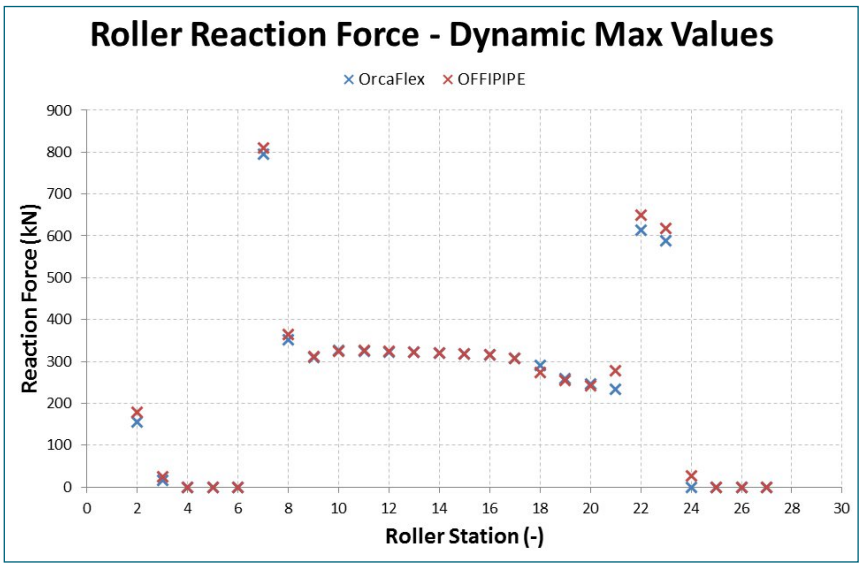
- **Correct tensioner placement** in OrcaFlex (on the barge at pipe start) correctly allows minor pipe movement over rollers, slightly flattening peaks in results.
- **Dynamic results presentation** - OFFPIPE results equate to a mix of OrcaFlex minimum and maximum range graph results.
- **High frequency damping** - OrcaFlex fully and correctly captures stress waves travelling along the pipe (from eg., intermittent pipe-roller contact).
- Slight differences in the specification of **non-linear moment-curvature data**.
- Subtle differences in the calculation of **von Mises strain**.

Once these differences were accounted for, then the results (e.g. graphs on right) were in near-perfect agreement.

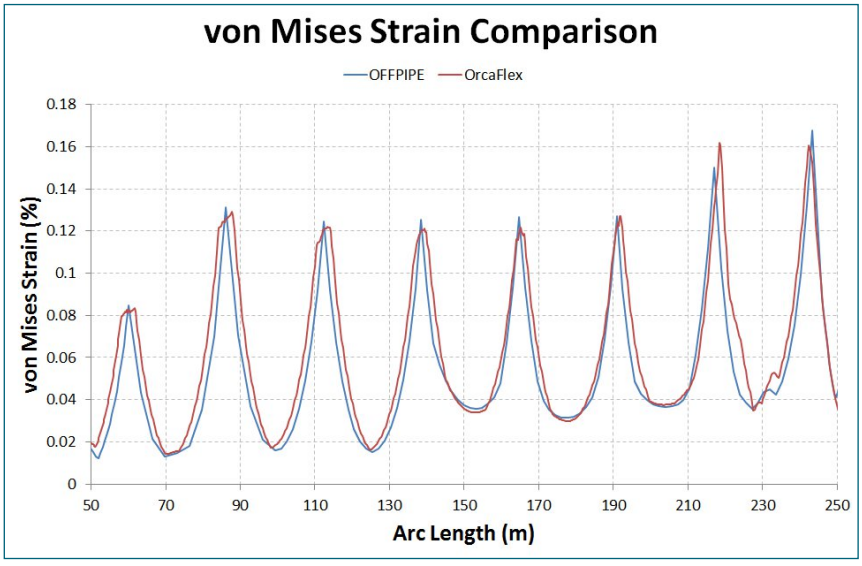
Statically, there was again near-perfect agreement: For Case A, layback differed by less than 0.01%, bottom tension differed by less than 0.2% and stinger tip separation differed by less than 1.1%. For Case B, all results were identical.



Case A: Different meshes still agree



Case A: Excellent agreement



Case B: Excellent agreement

Further applications

OrcaFlex can also be used for a huge range of other applications, including:

- **Riser Systems**: TTRs, SCRs, hybrids, flexibles, umbilicals, offloading & floating hoses
- **Installation**: Risers, moorings, anchors, lift dynamics, subsea hardware, floatover, decommissioning, etc.
- **Moorings**: Global Performance, coupled, permanent & mobile, SPMs, TLPs, SPARs, oceanographic & jetty, etc.
- **Pipelines**: on-bottom stability, spans, VIV analysis, trawl impact, etc.
- **Renewables**: compliant wind & wave systems, power cables.
- **Towed Systems**: Bundles, seismic arrays, towed fish, etc.
- **Other applications**: aquaculture, booms, sea-fastening, minesweeping,...

Key features

- Time and Frequency Domain solvers
- Automate via Excel, Python, Matlab, C++, etc
- Proven FE engine
- Most efficient & robust in class
- Coupled or uncoupled analysis
- Major releases annually
- Best-in-class technical support
- Worldwide annual user meetings

Commercial options

OrcaFlex is easily the most cost-effective in its peer group

- All-in-1 package - no extra modules
- Multi-threading at no extra cost
- 'Distributed' tool boosts throughput
- Comprehensive MUS (Maintenance, Upgrades & Support) contract
- Multi-copy price discounts
- Purchases include a free MUS period
- Month-by-month leasing, includes MUS
- Lease-to-purchase credit option

More information

Please see our website for OrcaFlex release information, User Group Meetings, training courses, newsletters, papers, validations, technical notes, and many other resources.

About Orcina

Founded in 1986, Orcina is now widely recognised as a global leader in its field, with a well-established reputation for innovation, excellence and real-world capability. Our software and approach is flexible enough to accommodate the needs of large corporates requiring hundreds of licenses and individuals who just require one. The core sectors we serve are focused on research, analysis and engineering in oil & gas, wet renewables, oceanographic, seismic, defence, and aquaculture. However we are constantly developing our software to meet the needs of evolving engineering challenges and new market requirements.

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