

MORE

Reservoir Simulation

Tempest MORE is a modern, next generation reservoir simulator, offering black oil, compositional and thermal options. Optimised for very large models, engineers benefit from fast simulation, parallel processing, and extremely quick results analysis in both 2D & 3D. Deck setup is simplified by graphical event editing and MORE's Smart Operation, which allows realistic production scenarios to be managed in a flexible and extendable way.

IN SUMMARY

- Tempest MORE was first commercialized in 1999 and is used on some of the world's largest fields.
- Direct input of well trajectories, historical tables and structured events make simulation setup fast and efficient.
- Tempest MORE includes a broad range of functionality, including EOR techniques in a single module.
- Tempest MORE uses the Tempest VIEW interface, a powerful, easy to use and memory efficient pre & post processor.
- Tempest MORE includes robust treatment of highly deviated, horizontal and other complex well configurations.

Broad Functionality

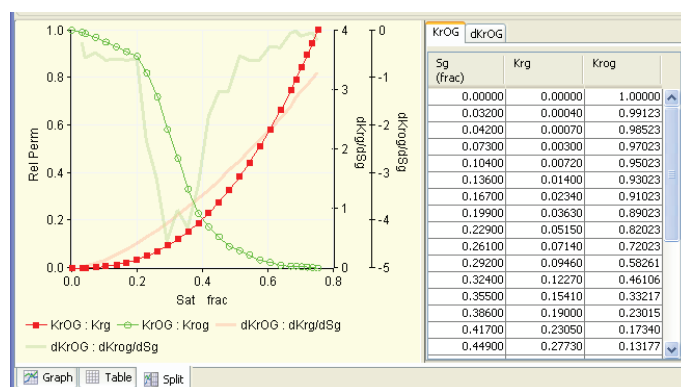
Tempest MORE can be employed in both compositional & black oil modes. It provides the following functionality in a single module:

- o Black oil and gas condensates.
- o Compositional Equation of State.
- o Enhanced oil recovery techniques, including CO₂ and polymer flooding, thermal and steam options.
- o Dual Porosity/Permeability.
- o Coal Bed Methane.
- o Near and In Well Modelling & segmented well model.
- o Parallel processing
- o Local grid refinement

- o Gas lift optimization
- o Network modelling
- o Algebraic multi-grid linear solver
- o Multipoint flux approximation

Fast deck preparation

The simulation wizard and library of standard simulation examples allow input to be prepared with a minimum of fuss. Events in the simulation may be filtered and viewed by well or by time. Table data may be edited graphically. Alternatively the data may be changed using Tempest's in-built customised editor.

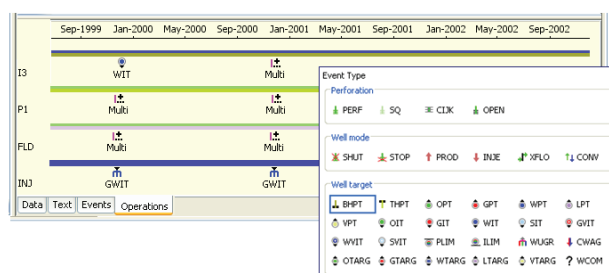


Graphical or table editing of all data makes simulation setup fast and efficient.

Flexible Simulation Management

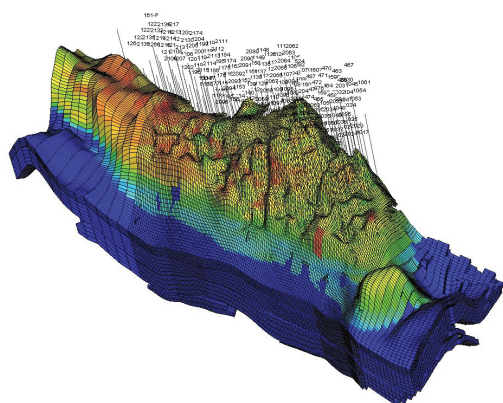
Tempest MORE offers many features which make the management of the simulation clear and efficient:

- o Clear presentation of simulation deck events in a structured, iconised format.
- o Interactive event and operations editing.
- o Interactive editing of PVT and relative permeability data.
- o 'Smart Operation', which allows realistic production scenarios to be managed in a flexible and extendable way. Used for wells, regions, groups and completion intervals.
- o Automatic event consistency checker.



Event time line display and iconised list of events gives interactive and flexible simulation management

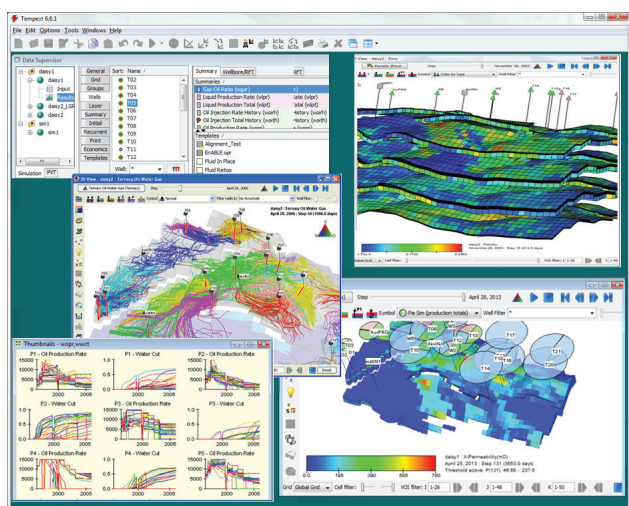
Optimised for large data sets



Millions of cells, thousands of wells

Since its first commercial release in 1999, Tempest MORE has been used by customers to simulate very large models, with millions of cells and thousands of wells. The need for fast simulation has been created by engineers wanting to model closer to the geological scale and, more recently, by improved technology in uncertainty analysis and multiple runs, meaning that multiple simulations and sensitivity studies are increasingly becoming the project norm.

As well as its fast solver, Tempest MORE gives exceptionally quick and comprehensive data mining and results analysis, through the Tempest VIEW interface. The 'load on demand' technology gives quick access to the largest datasets and the powerful regional analysis tool allows filtering based on layers, fluid in place regions, or drainage areas. The streamlines analysis and history matching tools give further insight into simulation results.

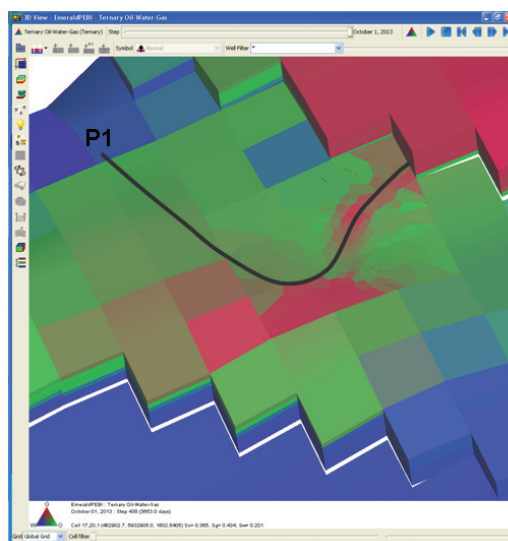


The Tempest VIEW interface complements Tempest MORE's fast solver, by offering quick and comprehensive data mining and results analysis. Large datasets, multiple runs and sensitivity studies are completed efficiently, with maximum value extracted from simulation results.

Simulating Complex Wells

When incorporating highly deviated or horizontal wells into a simulation, results are often compromised because flow around the wellbore cannot be effectively represented. Tempest MORE has a range of options designed to model well and near well effects accurately:

- o Advanced multi-segment well modelling algorithms, which compensate for friction, gradient and pressure changes.
- o Unstructured PEBI grid construction around the wellbore, which allows more accurate flow simulation without the need for regional LGR.
- o Editable trajectory tables in original data format, which eliminate the need for editing between runs.



Ternary gas-oil-water 3D view showing PEBI gridding around the wellbore.

Hardware Configuration

Tempest MORE operates in single processor, or parallel modes. A standard Tempest license provides access to parallel processing on up to two cores. More cores can be added at a very competitive price. Supported platforms:

Windows

- o XP/Vista/7
- o 32 and 64 bit
- o Windows HPC (clusters)

Linux

- o Red Hat Enterprise Linux versions 4, 5 & 6
- o 64 bit
- o Clusters and workstations

For further information on Tempest MORE please contact us at tempest@roxar.com or go to our website www.roxarsoftware.com.