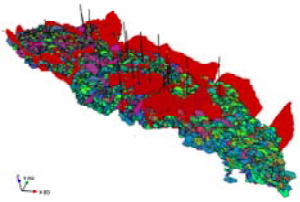
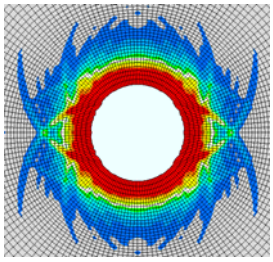
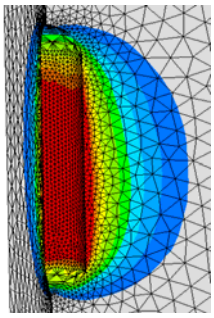
Numerical Modelling
for the Oil & Gas Industry



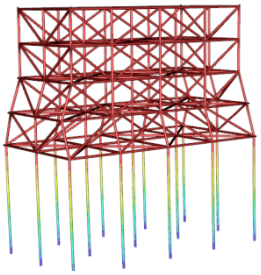
DFN fractured reservoir



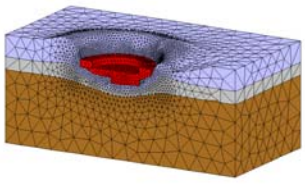
Borehole collapse mechanisms



Gas cavern pressurisation



Platform stability



Foundation settlement

Golder Associates is able to provide the Oil & Gas Industry with a full range of numerical engineering consulting services. We provide you with the benefit of local experience, supported by the skills, capabilities and knowledge of our global network when highly specialised services are required.

Our range of numerical modelling services includes the following:

- Hydrocarbon reservoir caprock and seal integrity modelling;
- Hydraulic fracture modelling;
- Subsidence and compaction evaluation;
- Wellbore stability (borehole breakout) analysis;
- Fault displacement modelling under tectonic loading;
- Fracture porosity analysis;
- Induced Seismicity;
- Cavern integrity analysis for creep dominated materials;
- Seabed-pipeline-iceberg interaction;
- Onshore pipeline stability analyses; and
- Optimisation of production profiles.

The modelling tools that we apply include the following:

- **ELFEN** – a sophisticated 2D and 3D FE and DE fracture modelling code for analysis of deformation processes in soft solids and hard rock materials;
- **FracMan** – the worlds premier DFN based fractured reservoir simulation tool; and geomechanics kinematic stability assessment tool;
- **FLAC/FLAC^{3D}** – an advanced 2D and 3D continuum geotechnical modelling tool;
- **GoldSim** – a dynamic evolving assessment tool for predicting risk, vulnerability, cost modelling and project planning;

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