

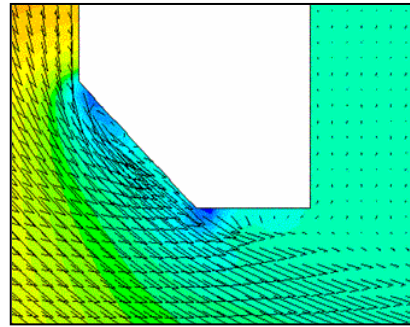


## CFD FLOW MODELLING

Computational Fluid Dynamics (CFD) flow modelling is a powerful technique which is used to predict the detailed three-dimensional behaviour of liquid, gas and multiphase flows through pipework and process components. TUV NEL has been at the forefront of applying CFD to study industrial flow processes for over 20 years. We excel at combining practical test and field experience with a well-developed appreciation of the merits and limitations of CFD modelling to produce practical solutions to challenging problems.

### Flowmetering

We have a long history of using CFD to predict flow measurement errors caused by upstream pipework, poor installations and non-ideal conditions. Applications have included:



- Orifice plates, Venturis, ultrasonic meters, turbine meters & electromagnetic meters
- Flow conditioners and flow straighteners
- Multiphase and wet gas flows
- Assessment of roughness effects, manufacturing tolerances and contaminant build up

### Erosion & Sand Management

TUV NEL has shown that CFD modelling can provide valuable insights into erosion and sand management problems in oil & gas production and drilling applications:

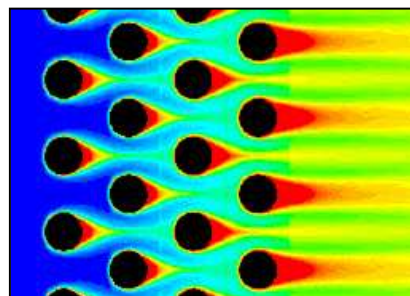


- Erosion of elbows, Xmas trees, wellheads, manifolds, flowlines, chokes & downhole installations
- Cavitation erosion in chokes and valves
- Downhole and surface sand, proppant and cuttings transport
- Desander optimisation
- Sand settling in separators

### Thermal Engineering

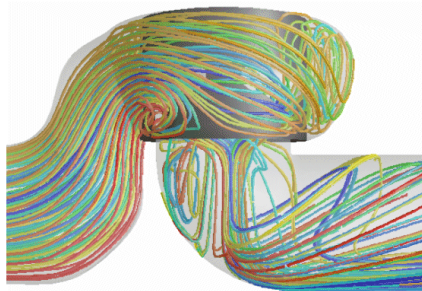
We have successfully utilised CFD in a number of thermal management studies:

- Subsea insulation design
- Heat exchanger modelling
- Pipework & well cool-down calculations



## Process & Environmental Engineering

At TUV NEL we have used CFD to study a wide range of process engineering problems both onshore and offshore:

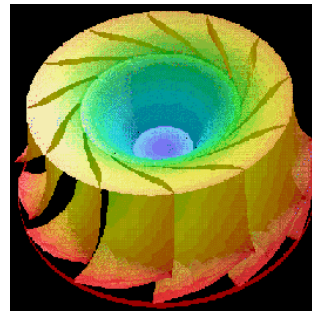


- Separator and demister performance prediction
- Valve failure studies
- Design of water disinfectant devices
- Incinerator emissions calculations
- Emission dispersion predictions
- Reactor vessel residence time predictions
- Combustion modelling

## Energy Generation & Clean Energy

TUV NEL has performed a wide range of studies for clients in the power generation sector:

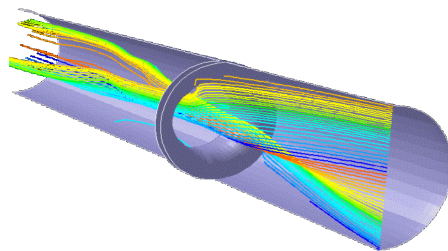
- Hydro turbine fish-kill predictions
- Wind yield predictions in urban areas
- Fuel cell design
- Nuclear clean-up operations



## Other Applications of CFD

CFD can simulate many industrial flows and has an incredibly diverse range of potential applications. It can be a complement or an alternative to laboratory testing or field trials. In particular it can assist in understanding unexplained flow behaviour or scaling laboratory data to field conditions.

At TUV NEL we have a long track record of using CFD to produce practical solutions to new and difficult industrial problems.



For all enquiries, please contact:

TUV NEL, East Kilbride, GLASGOW G75 0QF, UK  
Tel: +44 1355 220222 Fax: +44 1355 272999  
Email: [sales@tuvnel.com](mailto:sales@tuvnel.com) [www.tuvnel.com](http://www.tuvnel.com)

