

Monte Carlo or bust!

The Monte Carlo simulation technique was developed in the mid-20th century by Stanislaw Ulam. In his autobiography *Adventures of a Mathematician* he explains that it was named after the world famous casino in honour of his uncle, who was a gambler, at the suggestion of Nicholas Metropolis.

Named after the casino and games of chance, the Monte Carlo Simulation Technique is an extremely powerful analysis tool . . . for those who would prefer not to gamble with their assets! The technique is an accepted method for modelling processes which are influenced by a large number of individual events occurring randomly in space and time. The Monte Carlo Simulation Technique is well suited to calculation using a computer.

Using this software complex real life operations can be modelled using deterministic data (known events) or

probability distributions (random events with best estimates). BPP-TECH's sophisticated software package Monte Carlo Simulator and its team of specialist engineers have provided clients with solutions for a wide range of complex applications.

BPP-TECH makes extensive use of Monte Carlo simulation techniques for numerous applications including the assessment of complex offshore operations limited by factors such as equipment and manning availability, failures and outages, weather sensitivity and motion limits. BPP-TECH engineers have applied Monte Carlo techniques to numerous engineering and insurance related scenarios to establish, beyond reasonable doubt, appropriate levels of costs. The method has the key advantage in that it provides a probability that a specific outcome will be achieved (e.g. 99% probability that repair cost will be less than \$5m).

Applications include:

- Assessing repair options: start date, vessel availability, transit and performance, standby time and weather
- Tow out/installation: current, tides, weather forecasts, tug selection & deployment, crane vessel lift limits
- Floating vessel operations: tanker capacity, transit times, connection & disconnection criteria, weather, minimum product levels, rig movement following storm line breakage

