

Monte Carlo Simulation for the Oil and Gas Industry

1.6 CEUs (Continuing Education Units) awarded for this 2-day course.

Instructors

James Murtha, Consultant
Susan Peterson, Consultant

Intended Audience

The course is intended for engineers, geologists and geophysicists, managers, planners, economists and technical support staff. Participants are expected to have experience using models to solve problems (e.g. production or economic forecasting, reserve estimation, scheduling) and to be comfortable with spreadsheets. No previous knowledge of the subject is assumed.

Description

This hands-on course features spreadsheet add-in risk simulation software (either Crystal Ball or @Risk). Models in exploration (reserves and P(S)), drilling, production, and economics, along with descriptive statistics in Excel will give a close look at several probability distributions and their applications. The course will cover software basics including menus, settings, distributions, outputs, graphics, statistics, sensitivity analysis, interpreting results, and creating reports. Focus of the course is on examining and modifying prepared models and building simple models. In addition, participants will analyze historical data using histograms, crossplots, correlation in Excel, and software to fit probability distributions to data. Several worksheet models are included. Some familiarity with Excel is expected.

Topics Covered

- ◆ Monte Carlo Simulation
- ◆ Language of Statistics
- ◆ Steps in Simulation Design
- ◆ Crystal Ball (or @RISK) Features: Inputs, Outputs, Settings, Simulation, Reports
- ◆ Models to Estimate Reserves * Changing Distribution Types and Parameters
- ◆ Production and Economic Forecasts
- ◆ Prices
- ◆ Operating Expenses
- ◆ Capital Expenditures
- ◆ Cross Plots and Correlation in Excel
- ◆ Cost Estimating Models
- ◆ Handling Rare Events
- ◆ Comprehensive Models
- ◆ Linking Model Components
- ◆ Class Problems

About the Instructors

Jim Murtha presents seminars and training courses and advises clients in building probabilistic models in risk analysis and decision making. He is an industry-recognized expert on risk and decision analysis; he was named a Distinguished Membership of SPE in 1999, the recipient of 1998 SPE Award in Economics and Evaluation, and was 1996-97 SPE Distinguished Lecturer on risk and decision analysis. Since 1992, more than 2,200 professionals have taken his classes. He has published **Decisions Involving Uncertainty**- an @RISK Tutorial for the petroleum professionals. In 25 years of academic experience, he chaired a math department, taught petroleum engineering, served as academic dean of a college, and co-authored two texts in mathematics and statistics. Murtha has a Ph.D. degree in mathematics from the U.

of Wisconsin, an MS degree in petroleum and natural gas engineering from Penn State U., and a BS in mathematics from Marietta College.

Susan Peterson has more than 20 years' experience as a consultant, project manager/senior drilling engineer, and instructor. She specializes in the application of risk analysis and decision methods for full field development optimization and AFE time and cost models. As a consultant, she performs project-specific risk analysis and provides training on decision and risk analysis. Peterson led a risk analysis and decision methods initiative, and has been responsible for the risk analysis on projects that ranged from fast-track remote gas field development to large capital expenditure oil development. She holds Ph.D. and MS degrees from Texas A&M U and a BS degree from Marietta College, all in petroleum engineering.