Spiral Software Tools for Assay Management

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Spiral Software
Outline

1. Introduction to Spiral Software
2. Example: Variable Crude Quality
3. CrudeSuite: Crude Assay Management tools
4. Demonstration
Introduction to Spiral Software
Introduction to Spiral

- Founded in 1998, based in Cambridge, UK
- Specialise in developing advanced technology for crude oil data handling and modelling
- Expertise in building models from large and variable-quality data sets
- Expertise in managing large databases and providing global IT solutions
Inspiration

- Crude oil quality is decreasing
- Product quality specifications are becoming tighter
- Increasing industry realisation of cargo oil quality variation economic impact
- Opportunity to provide tools and services focussing on crude oil data handling and quality variation
- Making innovative use of recent advances in mathematics and IT
Software Implementations

- **Integrated oil major:**
  - Global, web-based system
  - Input data from internal and external data sources
  - Provides data to simulation, planning and scheduling

- **Single-site refiner:**
  - Desktop-based system providing data for planning and scheduling systems

- **Equity crude producer or trading company:**
  - System for determining detailed refining value to consumer refineries
Consultancy and Services

- Laboratory analysis
  - Integrated assay facility through a network of partner laboratories
- Crude oil database management
- Planning and scheduling systems
  - Making best use of crude oil data in planning systems
  - Understanding risk
- Client-specific modelling
  - Advanced modelling projects
Example: Variable Crude Quality
Variable Cargo Qualities

- Crude oil trades are unusual: large transactions on the basis of very limited quality information.
- Often only density and sulphur are known.
- Swings can be very large between cargoes: up to 4 API in whole crude density.
- Cargo variation in API has a large impact on refining values:
  - Yield risk: 30% change in cut yields
  - Value risk: >$2/bbl value difference
Sources of Variation

- Seasonal variation
- Planned change in production blend
- Unplanned change in production blend
- Contamination
- Transport changes
Cargo Property Forecast Graph

Sample Date
$51.05/bbl

$52.30/bbl

$1.25/bbl fall in refined value over 5 years

Generic medium complexity refinery, European market, July 2004
$51.08/bbl

$52.40/bbl

$1.32/bbl fall in refined value between cargoes in 3 months

Generic medium complexity refinery, European market, July 2004
CrudeSuite: Crude Assay Management
CrudeSuite Tools

- CrudeSuite is a range of desktop and network tools for corporate implementations
- Features include:
  - Tabular and graphical data viewing and editing
  - Prediction of complete qualities from limited data
  - Sharing qualitative crude oil experience and news
  - Economic modelling tools
  - Off-the-shelf integration with downstream tools
  - Network synchronisation
Assay Data Features

- Customisable data entry, built around typical assay formats
- Correct handling of repeat measurements
- Advanced data validation
- Perfect and thermodynamic fractionation modelling for both input and output data
- Configurable blending methods and user property correlations
Demonstration