Managing Quality Variations

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Introduction to Spiral

- Founded in 1998, based in Cambridge, UK
- Crude oil tools support assay work up and database maintenance process through to final delivery into planning and simulation tools
- Spiral tools adopted by over 50 companies on over 160 sites, including global implementations by Shell, BP and Chevron
- One major application is helping clients optimise feedstock selection, making best use of data to control risk and even derive benefit from cargo quality variations
Crude Oil Contaminants

- Crude oil can be characterised in terms of “properties” (yield distribution, density, viscosity, pour point etc.)
- Contaminants can broadly be characterised as materials in crude oil which have a negative impact on processing.
- Contaminants can have major impact on processing:
  - e.g. Sulphur content: fuels fall outside legal specification
  - e.g. Metals: catalysts can be poisoned
  - e.g. Organic chlorides: corrosion in reformer units
Crude Oil Contaminants - II

- Crude oil contaminants can be:
  - **Intrinsic to the crude** (present in the crude reservoir)
    - E.g. Metal content
      - Vanadium and nickel may be present as complex molecules in the crude reservoir.
  - **Extrinsic to the crude** (introduced during extraction or transport)
    - E.g. Organic chlorides
      - Solvents containing organic chlorides may be used at production sites to help dissolve paraffins. These are introduced during
Example workflow 1:

- **Managing extrinsic contaminants**
  - A key user has set up a “Crude Approval Grid” based on the amount of Organic Chloride in the crude naphtha
  - Laboratory measures organic chloride content for a new cargo and enters it into CSi
  - Relevant users in the trading, scheduling and planning organisations are immediately alerted to the change in organic chloride content
Example workflow 2:

- Managing intrinsic contaminants

  - The laboratory finds that vanadium content for a new cargo has increased compared with the reference crude.
  - The laboratory enters this data into CSi
  - The crude scheduler is alerted to the change in cargo metal content
  - The scheduler uses BlendExplorer to update the blend to meet the metal contaminant specifications for the refinery feed
Demonstration: