Project Updates

Crude Oil Quality Group (COQG) Meeting
Long Beach, CA
February 26, 2009
Project List

• **Active projects**
  - Iron Fouling
  - Phosphorous in Crude Oil
  - Oilsands Bitumen Processability
  - TAN Project
  - NGL Contamination
  - Condensate/Diluent Quality

• **Project Proposals**
  - On-Line Contaminant Monitoring
  - Water Free Desalting
  - Fluorocarbons in Crude
Iron Fouling

• **Scope**
  - Examine the Role of Iron in Canadian Crude and Condensate
    - Role as an emulsion stabilizer - desalter operations
    - Role as a process foulant – distillation units, furnaces, filters, etc
    - Role in catalyst fouling or deactivation

• **Current Activity**
  - Sample of cat feed with high iron content being tested
    - supplied by Grace Davison
  - Emulsion samples being tested for the presence of iron species
    - supplied by PERF project
  - Improved, more comprehensive method for deposit analysis being developed by the Alberta Research Council (ARC)
Phosphorous in Crude Oil

**Initial CCQTA project in 1995**
- Distillation tower fouling in three refineries
- Potential sources of P were identified
- Encouraged and facilitated development of alternate chemistries with less P or less volatile P

**Current Activity**
- Pipeline monitoring indicates a reduction in volatile P content of crude during 2008, linked to:
  ✧ Reduced market activity
  ✧ Increased use of low volatile phosphorus alternatives
- Working to enlist government (ERCB’s) support for the segregation of gas well fracturing fluid returns as waste
Oil Sands Bitumen Processability

**Scope**
- Study unique features of Canadian Oilsands Bitumen that may enhance or impede processability.
  - Solids, salts
  - TAN, Asphaltenes
- Phase I ➔ Front end - desalting
- Phase II ➔ Back end – distillation, coking, cracking etc..

**Current Activity**
- Collecting 2nd round of samples for additional salt/solids testing, and coking/fouling studies
- Development of an improved, more comprehensive method for deposit analysis by the Alberta Research Council (ARC)
TAN Project

• **Scope**
  - **Phase II**
    - Detailed study of Naphthenic acids in crude and crude fractions
    - Corrosion testing including some benchmark crudes
  - **Phase III**
    - Development of a novel corrosion testing apparatus (NCUT)
    - Testing of gas-oil fractions of several Canadian Heavy Crudes and refinery benchmark gas-oils

• **Current Activity**
  - Testing of an Arab Heavy gas oil sample (high sulfur/low TAN)
  - Preparing summary report for review in March
  - Developing proposal for Phase IV testing
NGL Contamination

**• Scope**
- Understand the source of NGL plant fouling and potential impact on condensate quality
- Protocols and equipment designed to collect particulate material
- Protocols established for characterization of particulate material
- Work currently underway to collect and characterize additional samples and analyze data

**• Current Activity**
- Collecting and testing samples of NGL Fractionator feed
- Development of an improved, more comprehensive method for deposit analysis (Alberta Research Council, ARC)
Condensate Quality

• **Scope**
  - Focus primarily on contaminant issues with railed and common diluent pool condensates

• **Current Activity**
  - Testing of NGL Fractionator produced, and railed-in condensates
  - Preparing a sampling and testing protocol for other condensate sources
  - Development of an improved, more comprehensive method for deposit analysis (Alberta Research Council, ARC)
On-Line Contaminant Monitoring

**Scope**
- Identify target contaminants for monitoring.
- Determine existing capabilities
- Select a location/plant for testing of existing/new technologies
- Determine effectiveness of monitoring tool(s)

**Current Activity**
- Bring interested parties together in March to gauge interest and establish area of focus
- Undertake a review of existing capabilities
- Contact expert parties from other industry sectors for input/participation
Water Free Desalting

• **Scope**
  – Investigate options for reducing water requirements for refinery desalting
    ⊞ Crude filtration to remove brine/salt/solids
    ⊞ Desalter brine desalination
    ⊞ Reduction of salt/brine content at the production site

• **Current Activity**
  – Project proposal being reviewed by PERF members
  – Bring interested parties together at March CCQTA meeting to gauge interest levels
  – Contact expert parties from other industry sectors for input/participation
Fluorocarbons in Crude

• **Initial Scope**
  - Solicit information from members and interested parties on:
    - the types and concentrations of fluorocarbons used in various oilfield chemicals.
    - available information, tests, studies etc. on use and impact of fluorocarbons on refinery processes.
    - available information on impact of fluorocarbons in finished refinery products and stability of fluorocarbons in typical refinery unit operations.

• **Next Steps**
  - Bring interested parties together in March to identify participants
  - Project development funding provided by the CCQTA
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