

Canadian Crude Quality Technical Association -Update-

COQG Meeting

San Antonio, TX

October, 2008

CCQTA

The Canadian Crude Quality Technical Association

Outline

- CCQTA Project Updates
- New Project Proposals

CCQTA Project Updates

- **Six active projects**
 - Heavy Oil Methods Manual
 - Iron Fouling
 - Phosphorous in Crude Oil
 - Oilsands Bitumen Processability
 - TAN Project
 - NGL Contamination
- **Two Project Proposals**
 - Condensate/Diluent Quality
 - On-Line Contaminant Monitoring

Heavy Oil Methods Manual

- **Scope:**
 - Review existing analytical methods
 - Document limitations of existing methods with respect to heavy oils
 - Compile best practices and comparative data
 - Develop method modifications designed to increase method applicability to heavy oils
 - Currently only available to CCQTA members
 - Ongoing project funded by CCQTA members
 - Currently no methods under review or development

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**
 - No new samples collected for group study since June. Sampling will be restarted shortly.
 - Improved, more comprehensive method for deposit analysis (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
 - Enforcement of volatile P concentration began in early 2007.
- **Current Activity**
 - Pipeline currently engaged in routine monitoring
 - Some P fouling persists in refineries.
 - frac return treatment solutions continue to emerge in the market place.

Oil Sands Bitumen Processability

- **Scope:**
 - Study unique features of Canadian Oilsands Bitumen that enhance or impede processability.
 - Solids, salts
 - TAN, Asphaltenes
 - Phase I – Front end - desalting
 - Phase II – Back end – distillation, coking, cracking etc..
- **Current Activity:**
 - Collecting data on salt content and filterable solids

TAN Project

- **Scope of 3 Phase Project**
 - Phase I:
 - Measurement of TAN in heavy crudes
 - Distribution of TAN in distillation fractions
 - Impact of blending and transportation
 - 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 several Canadian Heavy Crudes and Distillates
- **Current Activity**
 - Data evaluation
 - Still developing/improving techniques for coupon analysis
 - Additional sample 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**
 - Process data from various facilities continues to be collected and shared with the group.
 - Additional samples being collected
 - Development of an improved, more comprehensive method for deposit analysis (Alberta Research Council, ARC)

Condensate Quality

- **Scope:**
 - Under Review
 - General consensus is that quality specifications need to be developed, monitored and enforced.
- **Next Steps:**
 - The project group will meet again in early December
 - Determine the proposed work schedule within and outside the scope of the NGL Contamination project
 - Establish funding requirements
 - Explore options for participation in the full NGL project, or the Condensate quality sub-project will be addressed. There may also be a telecom prior to the December meeting.

CCQTA
On Line Monitoring Of Crude Oil
Contaminants

Project Proposal

On line Monitoring of Crude Oil Contaminants

- **Project goal:**
 - To develop an on line monitoring tool for the purpose of measuring targeted contaminants in crude charged to a refinery
 - To use this equipment to quantify the impact of contaminant concentration on plant operation.

On line Monitoring of Crude Oil Contaminants

Background

1. In most industries, process control involves monitoring feedstock quality for all variables affecting process operation.
2. In the refining industry the link between contaminants and plant/process operation is anecdotal.
 - Difficult to capture contaminant concentration/variability using a spot sampling program

On line Monitoring of Crude Oil Contaminants

Background

3. Some refiners do employ on line monitoring of fractionated feedstocks
4. On line monitoring for the purposes of process control is a growing industry
 - Ongoing improvements in the capabilities of analytical methods
 - Numerous activities/efforts with regards to the automation of samplers/analyzers in other industries

On line Monitoring of Crude Oil Contaminants Scope

1. Bring together interested refiners to pool resources/learnings and determine key contaminants for investigation
 - Upgrade a previous list
2. Enlist the support/participation of interested equipment manufacturers
3. Identify a refinery site to evaluate/calibrate new monitoring tool
4. Collect data from refinery site to document the effectiveness of the new tool

On line Monitoring of Crude Oil Contaminants

Next Steps

Identify interested refiners

- Review project at COQG & CCQTA GM (December 3rd 2008)

1. Meet in March 2009 to establish

- List of key contaminants
- Need to establish a preliminary “cause & effect” relationship prior to the selection of a candidate monitoring tool

2. Review of existing equipment capabilities

- Identify potentially interested manufacturers

On line Monitoring of Crude Oil Contaminants

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