Course: Extra Heavy Oil Upgrading

12/12/2016 to 16/12/2016
From 8h30 to 17h – School of Chemical Engineering (Unicamp)

Prof. Daniel DUMAS

Objective
The objective is to provide engineers or undergraduate students with practical knowledge complementing theoretical fundamentals on petroleum technology.

Prerequisites
Knowledge of the basics principles of hydrocarbons distillation, thermal cracking, and hydrocarbons hydrotreating.

Contents

Part I
- Definition and quality of the extra heavy crude oils.
- General characteristics of the extra heavy crude oil fields
- Progressive capacity pumps, wells clusters, multiphase pumps, pipeline network in the field
- Principles of the extra heavy crude oil treatment in the field.
- Process installations in the field (limited to crude oil preparation).
- Pipe line system between fields and upgraders

Part II
- Raw material, finished products market. Upgrading principles
- Simplified process scheme of existing upgraders.
- Mass balance of simple and more complex upgraders.
- Process, operating variables, main issues, examples of simulated mass and sulfur balances.
- Examples of feed and products quality.
  - Atmospheric and vacuum distillations.
  - Deep conversion unit. Options.
  - Hydrotreating units. Options.
  - Auxiliary units: hydrogen manufacturing unit, sour gas and sour water treatment, sulfur recovery.
  - By-products handling.
- Comparisons between upgraders with different complexity in terms of yields, products quality and by-products.

Course dynamics
- Part I: extra heavy crude oil production
  - 1 day
  - No exercise
- Part II: extra heavy crude oil upgrading
  - 4 days
  - Comprehensive exercise to be implemented step by step after each chapter of the lecture to define the required capacity of each unit part of a simple upgrader based on extra heavy crude oil properties.
  - Quiz

Information and registration ONLY by the e-mail: oil.upgrading@gmail.com

When registering, please inform:
- Full name
- E-mail
- Academic degree
  - If graduate student also inform:
    - Level degree (PhD or MSc)
    - Name of your Supervisor
  - If post-doctorate researcher:
    - Name of your Research Supervisor

Limited availability (25 students)
Main activities
General Manager of an extra heavy crude oil company in the Orinoco Belt including geosciences, reservoir engineering, production, crude oil upgrading, upgraded crude oil marketing and sales, and all support departments.
General Manager of a Dutch refinery including process engineering, operations, maintenance, inspection, and support departments.
Head of technical services in the Ivory Coast (SIR) and refinery representative in project team for the 1997 and 1980 - 1982 expansion projects of this refinery.
First positions in production planning and refining process engineering in the West Indies (SARA) and South Africa (NATREF).

Teaching and training
Consultant in training activities and teacher in refining and chemical engineering since 2003.
Part of the team which founded the Algerian Petroleum Institute in 1966 - 1968 in cooperation with the French Petroleum Institute

Degrees
1965: Bachelor of Science
1965: École Centrale Lille (High school of engineers)
1966 : École nationale du Pétrole et Moteurs (Refining and Chemical Engineering)

Experience
1998 - 2003: General Manager of SINCOR Venezuela
1990 - 1997: General Manager of TRN refinery Vlissingen The Netherlands
1986 - 1990: General Manager of TRN refinery Vlissingen The Netherlands