

ESDU-SPG-M15-1

Sept.10: Fouling - Challenges and Opportunities

Unamended
Issued October 2010



Fouling - Challenges and Opportunities

Sub-project G (Cambridge Group)

Edward Ishiyama^{a,b}, Bill Paterson^a and Ian Wilson^a,

^aDepartment of Chemical Engineering & Biotechnology
University of Cambridge

^bIHS ESDU, Houndsditch, London

28th September 2010

Confidential. Copyright – University of Cambridge



Overview

- CROF sub-project G
- Ongoing work
- Future work



CROF (Oct 2006 – Sep 2009)

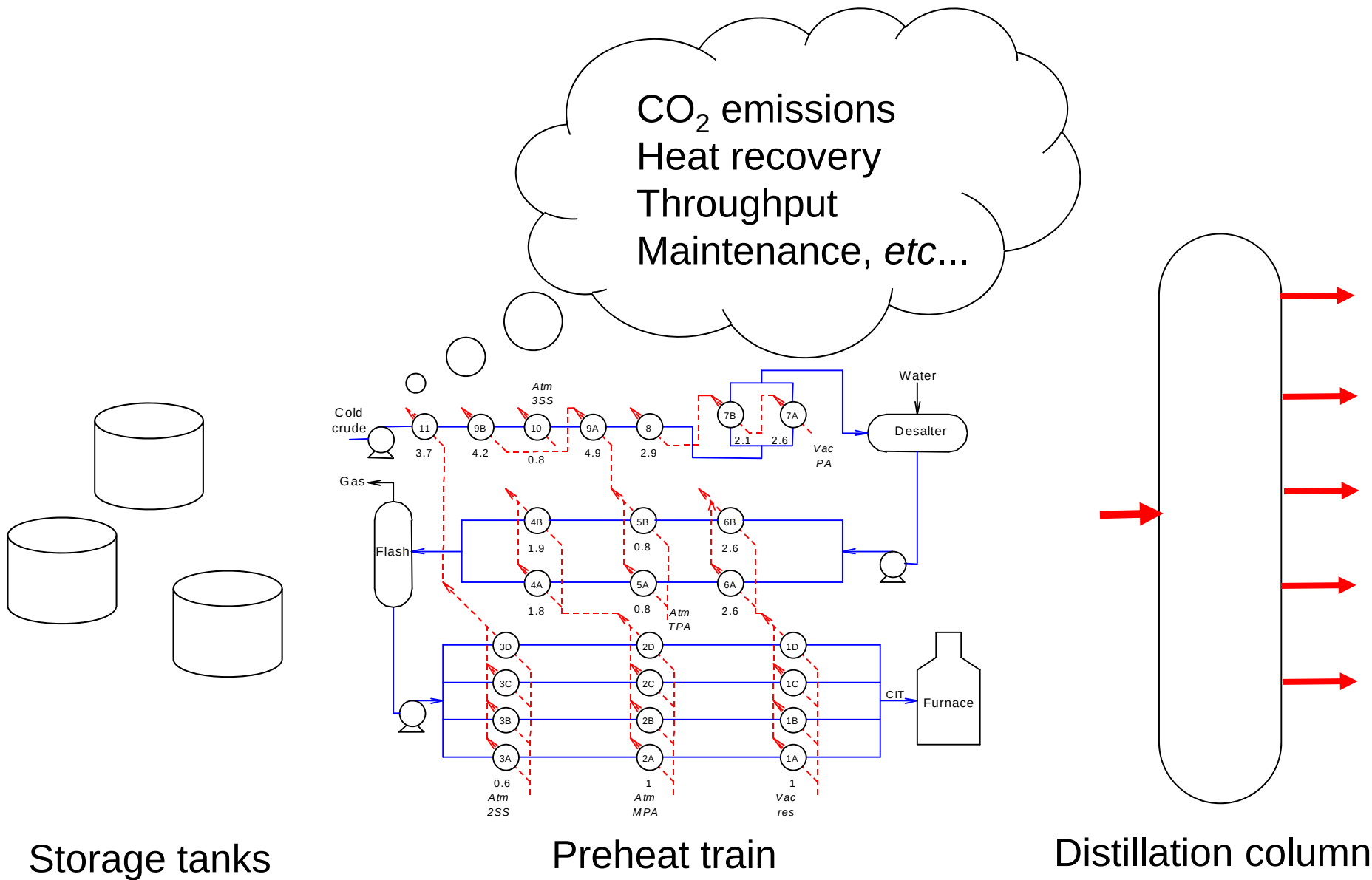


Achievements

- Crude oil fouling / ageing models (lumped parameter model)
- Preheat train simulator
- Collaboration with REPSOL YPF, Argentina
 - Data reconciliation study with TexacoChevron
- Technology transfer through IHS

d1





Simulator tool

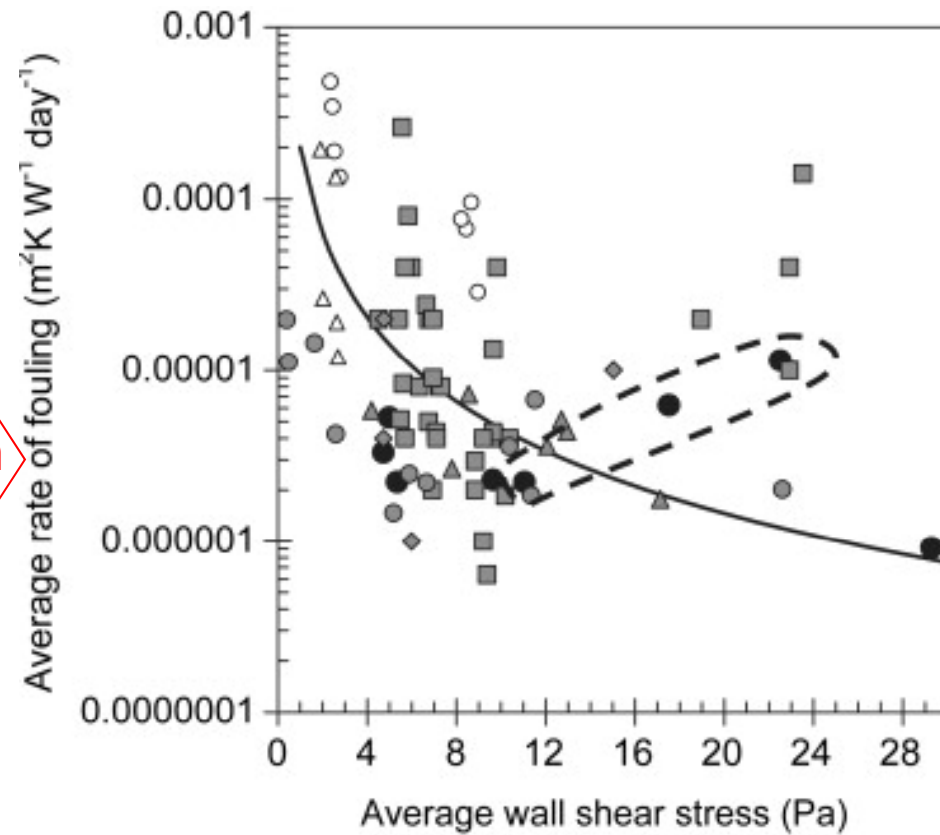
Inputs

Heat exchanger network structure
Heat exchanger configuration
Control/bypassing methodology
Fouling models
 Thermal
 Pressure drop
Fouling model parameters
 Data reconciliation
 Literature
 CROF sub-projects (?)

Outputs

- Network performance
- Optimise cleaning schedules
- Different operating modes
- Different control schemes
- Demonstrated on paper and real networks
- Take forward to commercial tool

The need for fouling models

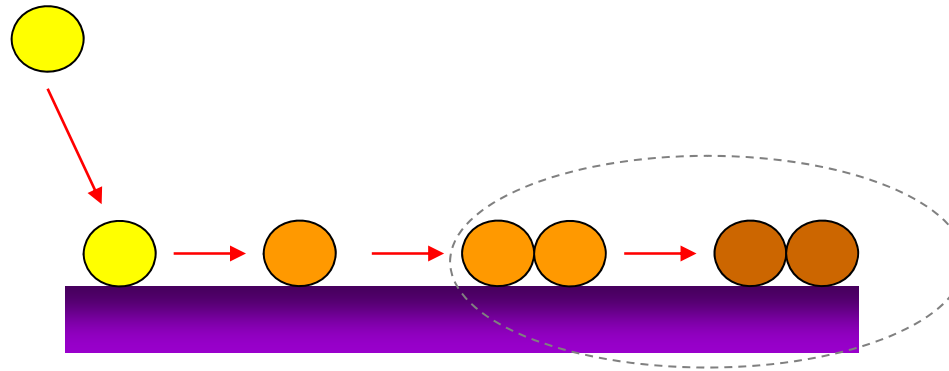


Temperature
Composition
Other factors

Joshi's observation

one velocity effect

Ageing



- Ageing affects deposit structure
 - thermal properties (heat transfer)
 - morphology

Mathematical models constructed: data needed for verification