

ESDU SPG-M5-3

Simulating operation of refinery preheat trains subject to fouling



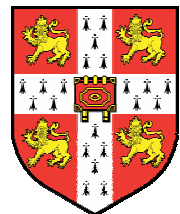
Unamended
Issued 01 Oct 2007
1

Simulating operation of refinery preheat trains **subject to fouling**

Edward Ishiyama

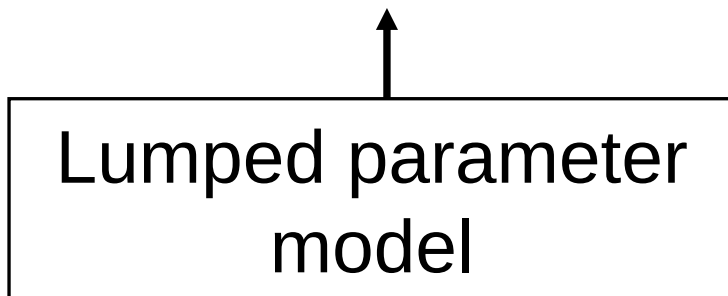
COPTFAM sub-project G
26th September 2007
Imperial College London

University of Cambridge
Dept. of Chemical
Engineering



Aim

- Optimise design and retrofit of PHTs subject to fouling
 - operation
 - network
 - HEX and pumps
 - Fouling



Software

- MATLAB and Excel

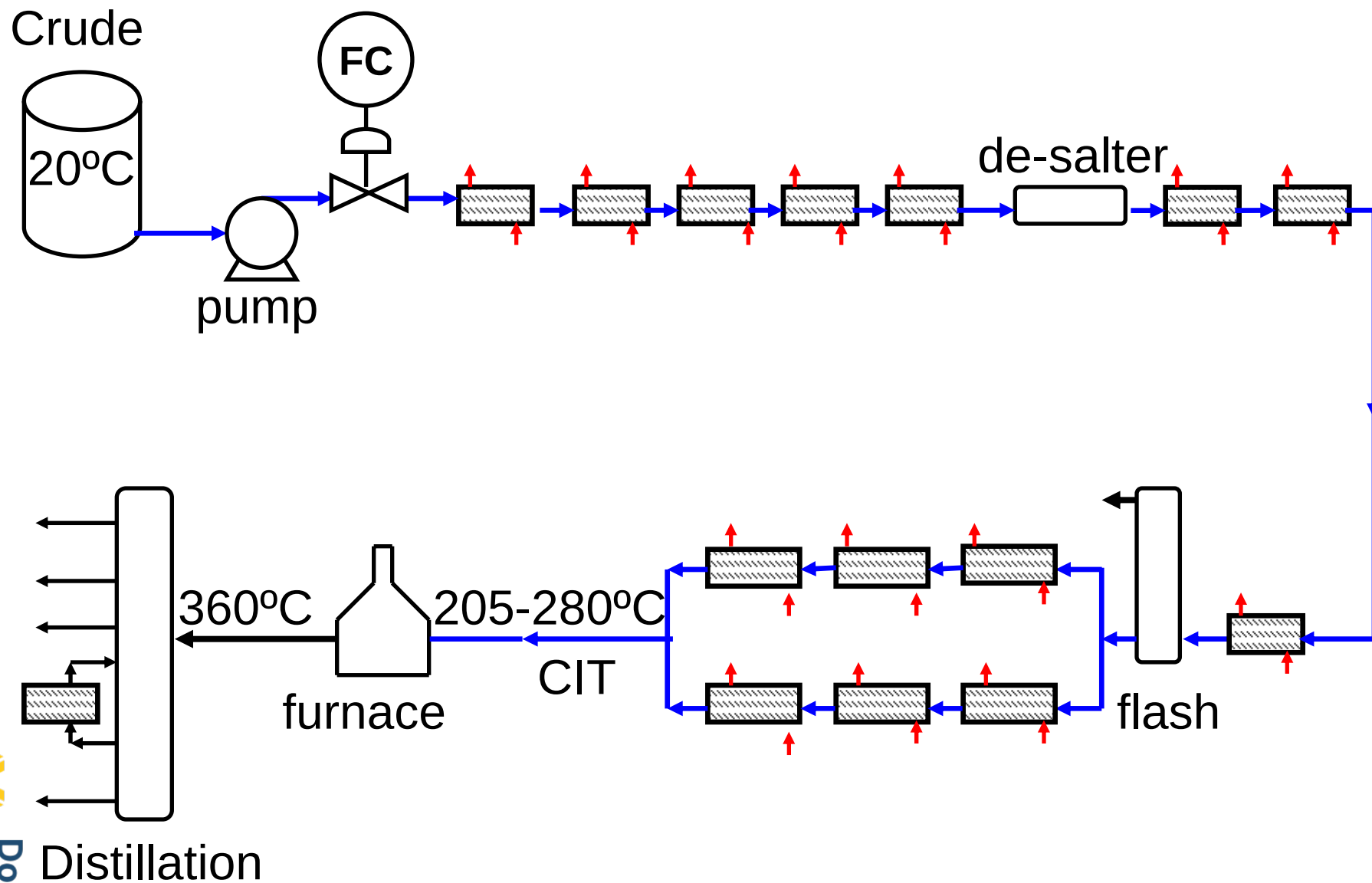
Modelling approach

Application

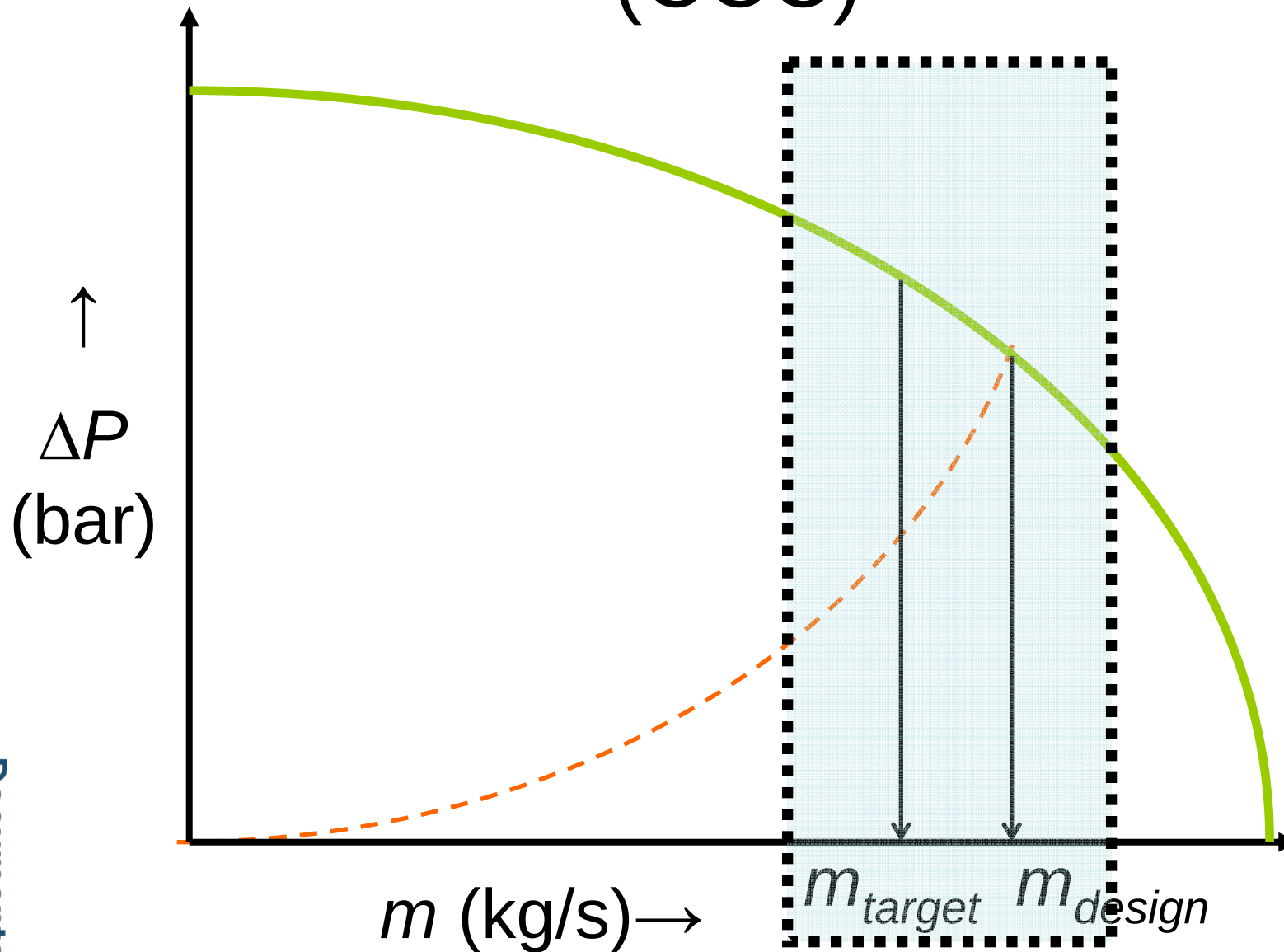
- Prediction of network performance
- Scheduling of cleaning heat exchangers
- Comparison of fouling mitigation scenarios
- Explore retrofit options

Industrial collaboration

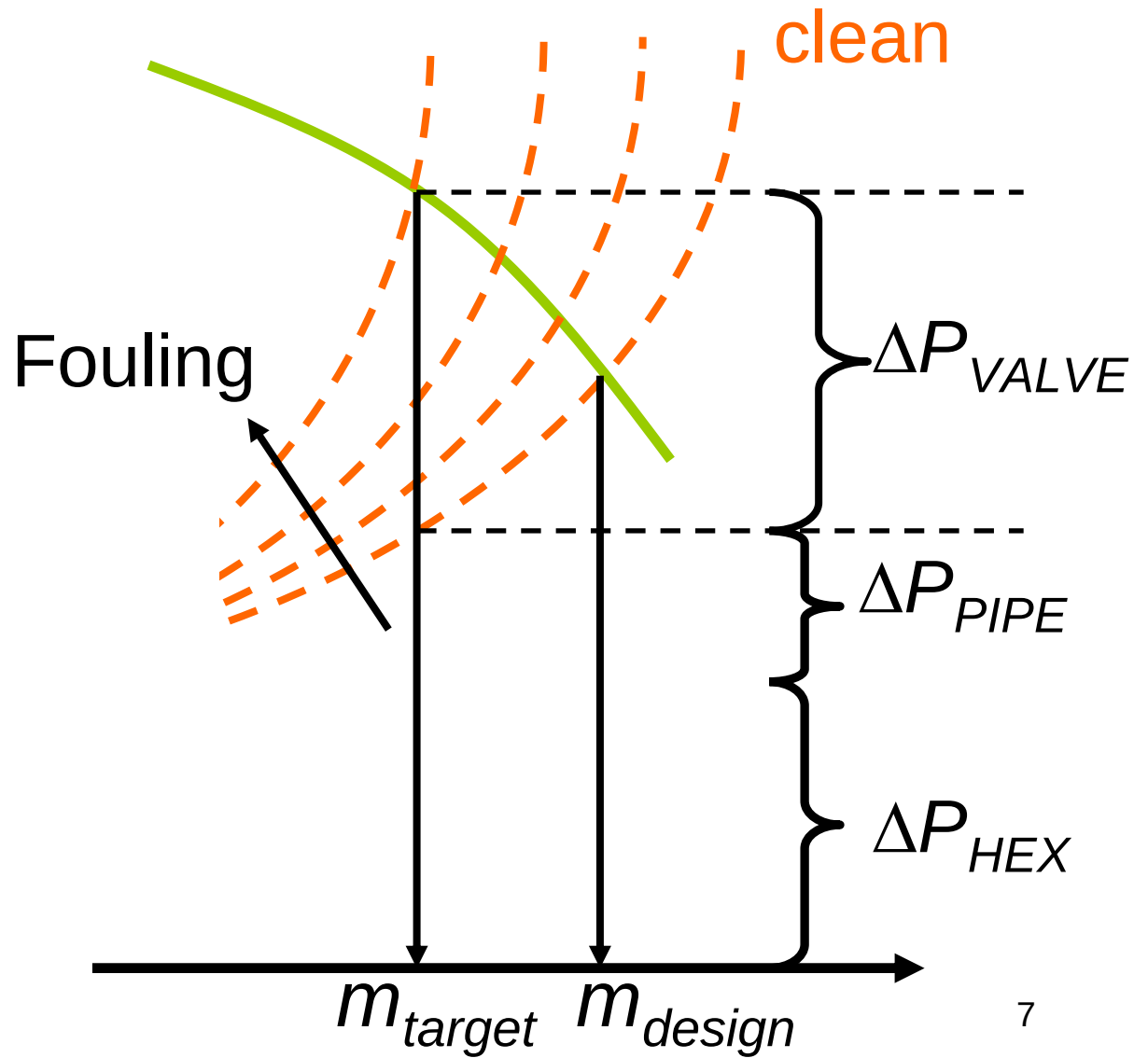
- Discussions: Shell, bp, ConocoPhillips
- CDA with Repsol (in progress)



Combined Characteristic Curve (CCC)



“Close Up”



Fouling rate dynamics

Ebert-Panchal model

$$\dot{R}_f = \alpha Re^{-0.66} Pr^{-0.33} \exp(-E/RT_{film}) - \gamma \tau_w$$

