

Model-based Engineering: Pushing the boundaries

gPROMS
ANNUAL
MEETING
2010

Agenda

London, 14–17 September 2010

Tuesday, 14 September 2010

Individual meetings by appointment

Wednesday, 15 September 2010

Optional seminars and Workshops

Wednesday, 15 September – Welcome drinks

19:00 – 20:30 Informal evening drinks reception for early arrivals at Hilton Kensington

Thursday, 16 September 2010 – Day 1

08:30 – 09:00 Registration

09:00 – 17:10 PSE, customer and academic presentations

18:30 – 21:30 Conference dinner

Friday, 17 September 2010 – Day 2

09:00 – 16:15 PSE and customer presentations

Locations

Presentations, 16–17 September

Hilton London Kensington
179–199 Holland Park Avenue
London W11 4UL
Tel: 020 7603 3355

Conference dinner, 16 September

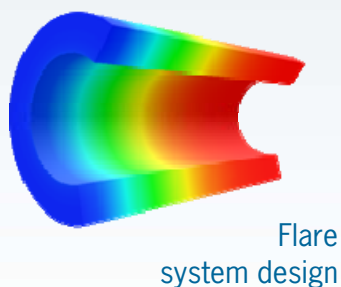
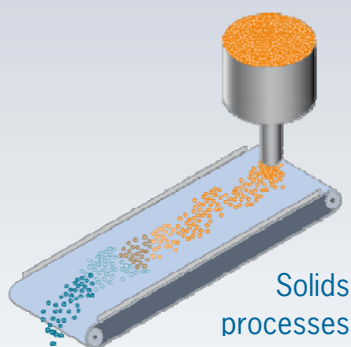
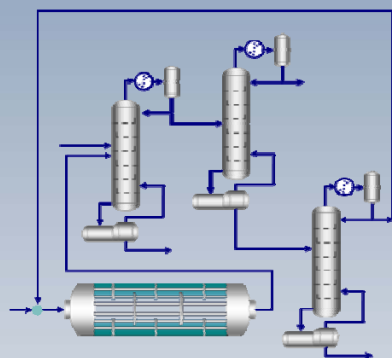
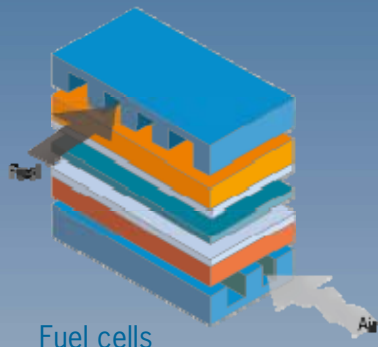
The Belvedere
Holland Park
London W8 6LU
Tel: 020 7602 1238

Seminars, 15 September

Novotel Hotel Hammersmith
2nd Floor Conference Rooms,
1 Shortlands, Hammersmith
London W6 8DR
Tel: 020 8741 1555

Workshops, 15 September

PSE Offices
6th Floor East
26-28 Hammersmith Grove
London W6 7HA
Tel: 020 8563 0888



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16 September 14 & 15 September

Tuesday 14 September 2010

Individual meetings

By prior arrangement

Wednesday 15 September 2010

Optional specialist seminars & workshops

09:30 Start

Seminar gPROMS Solids: an integrated framework for model-based engineering of solids processes

Workshop Creating library models for other users within the organisation

Workshop Parameter estimation: tips & tricks from PSE experts

12:30-13:30 Lunch (for all events)

Seminar gPROMS Crystallisation: an integrated environment for crystallisation process modelling

Workshop Model initialisation

Note: Seminars will take place at the **Novotel Hammersmith**; workshops at **PSE offices**

Thursday 16 September 2010

9:00 Registration for 9:30 start

SESSION 1 – Developments & directions

Introduction and welcome

Mark Matzopoulos
Marketing Director

PSE update: Bringing the power of model-based engineering to the end users

PSE is continuing to drive the application of high-fidelity predictive modelling throughout the process industries. MD Costas Pantelides explains why model-based engineering approaches now needs to focus on putting the power of such models in the hands of end users as well as modelling specialists, in order to maximise return on modelling investment.

Costas Pantelides
PSE Managing Director

Keynote: Implementing a corporate-wide model-based engineering approach in a large organisation

Procter & Gamble faces many challenges in the area of process modelling, not least the fact that traditional simulation tools are not readily applicable to their processes. This means that it is necessary to create fundamental building blocks in the form of models libraries that can be provided to engineering and operations users before applying these address challenging problems. Ben Weinstein describes how P&G has formulated a model-based approach to engineering design and operations and is developing the modelling infrastructure within the organisation to support this. He illustrates this with current work with PSE in creating a comprehensive solids modelling capability aimed at consumer goods manufacture.

Ben Weinstein
Procter & Gamble

10:30 – 11:00 Refreshments

SESSION 2 – Chemicals

Chaired by Syed Shah

High-fidelity modelling of phthalic anhydride reactor systems: challenges and opportunities

High-fidelity predictive models of tubular reactor systems pose numerous challenges and opportunities when it comes to overall optimisation strategies. Süd-Chemie applies such models to support PA producers in maximising plant performance. The presentation will discuss various aspects of this task, from laboratory through pilot plant to the final commercial plant operation.

Christoph Bäumler
Süd-Chemie

Utilising process modelling to drive yield improvement in an inorganic chemical process

Modelling was used to improve the process yield of a mature chemical process that has undergone decades of continuous improvement but is prone to frequent operations disruptions. The process contains highly non-ideal solutions, a blend of batch and continuous unit operations and many recycle streams. Determining the impact of key variables on a critical side reaction has allowed design of a relatively low-cost process change to improve yield.

Michael Driscoll
Carus Corporation

12:30 – 14:00 Lunch

SESSION 3 – Refining & petrochemicals

Chaired by Juan-Carlos Mani

Simulation and dynamic optimisation of products blending

Dynamic optimisation is used to optimise the cumulative production of certain final products obtained by blending different product streams in which composition and flowrates vary over time, taking into account process and hardware limitations and product specification constraints. The optimisation considers a time horizon during which a significant change in composition of the streams takes place.

Daniel Aluma
Shell Global Solutions

Modelling of a Fischer-Tropsch three-phase slurry bed GTL reactor

The F-T slurry bed reactor is a complex operation whose design benefits significantly from the application of detailed modelling. This presentation describes the modelling of the reactor in gPROMS and – as covered in the joint PSE-TOTAL-Invensys presentation at 2009 AIChE Annual Meeting – its deployment in PRO/II. *With acknowledgement to TOTAL and Invensys*

Alejandro Cano
PSE Principal Consultant

15:20 – 15:50 Refreshments

Whole plant design optimisation for a large-scale process

PSE worked with Repsol to perform a simultaneous design optimisation of a process involving a multitubular reactor coupled with a separation section that included a number of distillation columns, two with chemical reaction. Mixed integer optimisation techniques based on an economic objective function and applied simultaneously to the entire plant resulted in substantial CAPEX and OPEX savings.

Hilario Martin Rodriguez
REPSOL
Alejandro Cano
PSE Principal Consultant

Refinery preheat train modelling, simulation and energy optimisation – the next generation

New model-based techniques for optimising refinery preheat train operation are being applied to large refineries, resulting in significant bottom-line gains. This presentation describes the theory, its implementation within the gPROMS framework, some exciting results of initial applications with two major oil refiners, and benefits.

Sandro Macchietto
Imperial College London

17:10 Finish

18:30 Drinks followed by conference dinner: The Belvedere Restaurant, Holland Park

Friday 17 September 2010

09:00 Start

SESSION 4 – gPROMS & model-based engineering developments**gPROMS v3.3 – gPROMS & model-based engineering developments**

With v3.3, gPROMS takes a further step towards becoming a process flowsheeting tool for engineers while retaining – and extending – the custom modelling power that makes it the tool of choice for expert process modellers.

Major new features include model initialisation procedures, more sophisticated specification dialogs and a graphical task language for describing complex operating procedures.

This session takes a look at the new capabilities and their potential for driving productivity across the organisation. More in-depth information on some of the new features can be found in

James Marriott
PSE Head of
Applications Engineering

the workshop sessions of Thursday 22 April.

Exploring the space for innovation in Real-Time Dynamic Optimisation

While commercial RTO/MPC engines base their applications on low-order empirically-determined process models, the space for innovation in APC is far richer, allowing for different model formulations, control problem specifications and solution methods. In this presentation PSE shows how first-principles process models can deliver value when embedded in a prototype engine to solve complex industrial control and optimisation problems in real-time.

Pablo Rolandi
PSE Head of Software
Development

10:30 – 11:00 Refreshments

Unlocking the potential value of corporate knowledge in legacy models

Much valuable corporate knowledge is locked up in legacy programs across the process industries. Converting legacy code to gPROMS allows easy maintenance, extension of capabilities, addition of dynamics and use of optimisation, and the potential for application by users throughout the corporation. This presentation describes various applications, including Gas-to-Liquid Fischer-Tropsch reactors, evaporators and multi-stream heat exchangers.

James Marriott
PSE Head of
Applications Engineering

Moderated discussion session: where does process modelling go from here?

With the enormous strides that have been made in high-fidelity predictive modelling to optimise many different aspects of process design and operation, where does the technology and its application go from here? The panel of experts will provide their views briefly, followed by a question-and-answer session.

Chaired by Nilay Shah

12:30 – 14:00 Lunch

SESSION 5 – Design decision support and optimisation

Chaired by Sean Bermingham

Dynamic modelling of a new polylactide (PLA) production process

Purac and Sulzer Chemtech are collaborating to develop a new process based on static mixer technology for production of PLA from lactide. This presentation describes how model-based techniques allow the use of lab data for process design, to better understand and predict process behaviour and speed-up and optimise the design of PLA production plants.

Gerard van Bochove
PURAC
Stephanie Albrecht
Sulzer Chemtech

Model-based capital expenditure decision support for large-scale surfactant plants

Procter & Gamble is using modelling extensively to underpin key commercial capital decisions related to the design and operation of surfactant plants. This has involved a substantial activity focused on creating a modelling infrastructure in this 'non-typical' application area, including development of model libraries, large-scale flowsheet development and deployment across engineering and operations departments.

Diederik Vanhoutte
Procter & Gamble

Energy efficiency in waste water treatment plants: optimisation studies and process analysis

Veolia R&D and Ecole Polytechnique Fédérale de Lausanne (EPFL) are working together to optimise the energy efficiency of an industrial waste water treatment process. Plant-wide models of the process, which includes activated sludge reactors coupled with an anaerobic digestion reactor, are used within an optimisation framework to minimise energy consumption taking into account the bio-chemical transformations occurring inside the bio-reactors.

TBC
Veolia

16:15 Refreshments & Finish