A workshop to explore why, how, when and where Advanced Process Control techniques can be used to improve the efficiency, quality and robustness of pharmaceutical manufacturing processes

PerceptiveAPC

BENEFITS:

- Understand the When, Where and How for Advanced Process Control
- Integration with PAT to reduce real time process and product variability
- Demonstrate Improvements in process capability & OEE
- Gain an Introduction to Industry 4.0

THE NEXT STEP IN PHARMACEUTICAL MANUFACTURING

There are many changes taking place in the Pharmaceutical industry which will help the sector reach the manufacturing efficiencies seen in other formulated product industries. The new generation of flexible, agile, portable and continuous manufacturing equipment is providing the opportunity to re-think the overall Control Strategy to one which includes additional metrology (including PAT), real time statistical process monitoring and model based control strategies to optimise efficiency and quality simultaneously.

ADVANCED PROCESS CONTROL

Historically many of the tools mentioned above fall under the catch-all term "Advanced Process Control". Experience in processing industries has demonstrated that production throughputs can often be significantly increased, by driving the process to its dynamic constraints, whilst still achieving tight regulation of the process and it critical quality parameters. This workshop introduces the potential APC offers the pharmaceutical industry.

PERCEPTIVE APC

The PerceptiveAPC workshop has been developed by Perceptive Engineering to demonstrate when to (and when not to) apply Advanced Process Control, to enable improved controllability and process optimisation within pharmaceutical processes. The benefits sought are frequently focussed around the reduction in process variability, yielding improvements in both quality and productivity.

The workshop comprises two interactive days, providing the toolset and skills to identify which production assets offer the greatest opportunity for optimisation.

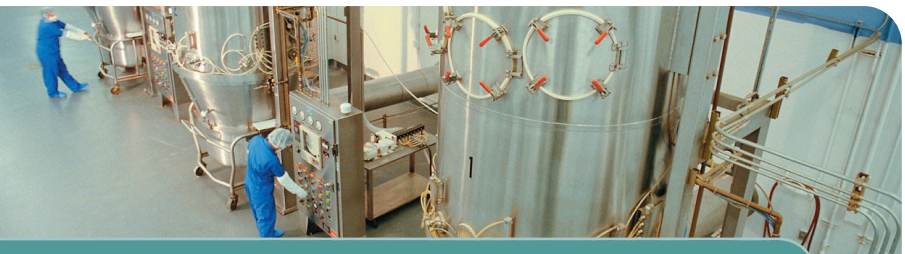
Using leading-edge software, delegates will learn how to add PAT to their process, how to analyse process variability using that new data, and how apply real-time statistical monitoring or feedback control, to achieve the greatest benefit.

THE PERCEPTIVEAPC™ WORKSHOP: INTRODUCTION TO ADVANCED PROCESS CONTROL

The workshop involves a detailed review of primary and secondary manufacturing units, with a focus on dynamic modelling to better understand the cause-effect relationships across the individual production units within the overall production process.

An introduction to basic control ensures all delegates are familiarised with the concepts of feedback control, before being presented with the advanced techniques which have been applied for most Pharmaceutical production units. Through the workshop we:

- Introduce the concepts of Advanced Process Control
- Review the interface between regulatory automation and APC
- Work through Case Studies developing dynamic process models
- Build and simulate a dynamic process model
- Develop a Model Predictive Controller
- Demonstrate how to include at-line data into the APC system



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Advanced Process Control for Pharmaceutical Scientists, Engineers and Regulators

The PerceptiveAPC Workshop

Introduction
- Workshop Objectives

Introduction to Basic Control
- Feedback Control
- Operating to recipes

Introduction to Advanced Process Control techniques
- Define Models for calibration, monitoring, control and Optimisation
- Inferential, ("Soft" sensor) applications
- White, Black and Grey Box modelling
- Model Predictive Control; what, why, when, where!

Introduction to PharmaMV Modelling Environment
- Real Time and Development
- Projects:
  - What is a project? Creating a new project
  - Loading an existing project
  - Project Workflow
- Dynamic Process Modelling Using PLS/RLS
- Data requirements for Dynamic Modelling
- Case Study- Multi-Effect Evaporator

Building a simple Model Predictive Controller
- Controller configuration
- Controller tuning

Workshop Day 1 Ends

Review Day 1
Objectives for the Workshop

Introduction to APC for Crystallisation
- Solution overview
- Trajectory following Model Predictive Control for supersaturation control
- Particle size control using FBRM

Simulating gCRYSTAL within PerceptiveAPC
- Case Study – CSTR crystallization
- Overview of the integration of gCRYSTAL model and PerceptiveAPC

Process Response Tests
- Process response tests to build a MPC for CSTR temperature control
- Process response tests for Metastable zone generation
- Developing the Supersaturation model

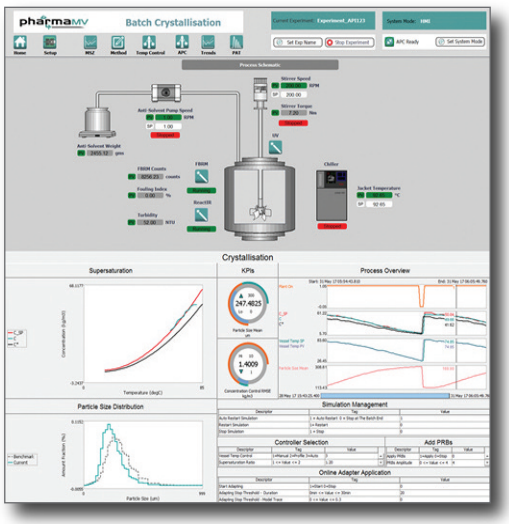
MPC Configuration
- Configuration of the Trajectory following temperature controller
- Configuration of the MPC for Supersaturation control

Workshop Day 2 Ends

PERCEPTIVE ENGINEERING LTD

works with some of the most innovative companies, including Pfizer, Abbott, GSK, Merck, Takeda and many others as partners in designing, developing and deploying Advanced Process Control strategies.

As a company in the Advanced Digital Design of Pharmaceutical Therapeutics (ADDOPT™) we are at the forefront of developments in the digitalisation of the Pharmaceutical Industry. And as a partner with many of the Continuous Manufacturing centres around the world including Rutgers (C-SOPS), CMAC, and AStar, we continue to contribute toward the future of pharmaceutical manufacturing.



perceptiveAPC

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