CHEMICAL ENGINEERING

UPCOMING FEATURES

APRIL 2011 | AD CLOSE: MARCH 4, 2011

THE BEST READ AND ONLY GLOBAL PUBLICATION IN THE CHEMICAL PROCESS INDUSTRIES

FEATURE REPORTS

Designing flexible heat exchanger networks (HEN) for multiperiod processes

Summary: This article presents an approach for designing an optimum, flexible HEN for different operating conditions. The approach is applied through two steps. The first one is developing a strategy for choosing the HEN's base case, upon which sensitivity tables are generated. The second step is using sensitivity tables to reach target temperatures and hence target utilities of the other alternative cases. The result is a HEN that realizes maximum energy saving under the different operating conditions — in other words, a HEN with flexible and optimum properties.

Related equipment and services: Heat exchangers, heat transfer fluids and heat transfer equipment in general

PEMS: The low-cost alternative to continuous emissions monitoring

Summary: Regulatory authorities around the world require continuous emissions monitoring (CEM) of some pollutants from large combustion sources. There are two main technologies for monitoring emissions on a continuous basis — one relies on sampling and analyzing exhaust gases from a continuous emissions monitoring system (CEMS); and the other relies on software that uses mathematical algorithms and equations to predict emissions levels from existing control-system data. This second system is called a predictive emissions monitoring system (PEMS). This article shares the practical experience and details of installation of CEMS and PEMS at the reformers and boilers of world's largest methanol manufacturing complex. The real-world experience gained over two years of operation is shared and can be used as a template to implement PEMS at any site.

Related equipment and services: Hardware and software used in continuous emissions monitoring; engineering and consulting services for emissions regulations and monitoring

FOCUS

Dryers and evaporators

Summary: This section will consist of a group of short descriptions of various types of industrial drying systems and evaporators.

Related equipment and services: Fluid bed dryers, centrifuge dryers, spray drying equipment, dessicants, evaporators

NEWSFRONT

Microreactor technology

Summary: It's not quite 20 years since microreator technology was declared a new chemical engineering discipline. Already these miniature devices that boast enhanced mixing, heat transfer and safety have entered the CPI plant, especially for the production of fine chemicals. This Newsfront will take a look at the progress to date and present the latest developments in this emerging technology.

Related equipment and services: Reactor systems and components (mixers, heat exchangers, pumps, valves, control systems) and modeling software

Please send submissions of editorial material to Senior Editor Gerald Ondrey (gondrey@che.com).

Mixing

Summary: Mixing is one of the most basic unit operations in the CPI, and also one of the most important. This Newsfront will present the latest developments in mixing technology.

Related equipment and services: All types of mixers and their components (impellers and blades, dynamic seals, CFD and other modeling software, static mixer internals, and so on)

Please send submissions of editorial material to Contributing Editor Joy LePree (jlepree@che.com).

FRACTIONATION COLUMN

Summary: This monthly column in CE is written by the technical director at Fractionation Research Inc., a consortium of end-users, engineering companies and distillation equipment providers that pool budgets on distillation research.

Related equipment and services: Distillation towers, trays and packings, tower scanning equipment and services

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ENGINEERING PRACTICE

Back-mixing during batch distillation: impact on yield

Summary: Facilites operating batch distillation columns are always looking for ways to minimize processing costs and increase product yields. This article presents two cases where back-mixing in the product-handling systems impacted batch yields and overall cycle time, and discusses effective solutions that have been implemented to improve distillation performance.

Related equipment and services: Distillation columns, column internals, separations, software and consultants specializing in distillation, heat exchangers, reflux-accumulations drums, distillate-storage systems, vacuum systems

Develop and design inherently safer process plants

Summary: Great strides continue to be made in making products, processes and process plants inherently safer. A study of successful case histories show that a few core principles can greatly improve overall inherent safety in the CPI. This article discusses the opportunities presented by three often-overlooked possibilities for implementing inherently safer processes, from process conception through plant engineering design.

Related equipment and services: Software and consulting related to plant, process and product safety, leak-detection equipment, fire-prevention equipment, pressure-detection instrumentation, safety-related instrumentation and controls, mechanical interlocks, process control systems

FACTS AT YOUR FINGERTIPS

Flow

Summary: This one-page reference will outline strategies for improving solids flow through the use of hopper inserts.

Related equipment and services: Bulk storage containers, wall liners, hoppers, hopper inserts

ENVIRONMENTAL MANAGER

"Green" water additives

Summary: The use of water in the chemical process industries (CPI) often leads to the problem of how to deal with scale. Several water additives have been used to minimize scale, but there has been a push toward "green" additives that biodegrade in the environment. This article examines the effectiveness of "green" water additives in inhibiting scale, as well as the approaches for assessing the ultimate fates of water additives in the environment.

Related equipment and services: Industrial water treatment systems, water treatment testing, scale inhibitors, water additives

YOU AND YOUR JOB

Mapping competencies of refinery operators and maintenance technicians

Summary: This article presents a detailed framework for mapping the technical capabilities of two key types of personnel in petroleum refineries — refinery operators and maintenance technicians. The goal is to identify all critical tasks, break them down into required skills and capabilities, and then assess the competency of individual workers to identify any gaps. Once this exercise is completed, the refinery can then plan and implement ongoing training and other types of intervention to bridge the gaps and optimize overall worker performance.

Related equipment and services: Consultants specializing in workforce optimization and technical training, software related to technical training

LOOK FOR THESE ARTICLES COMING IN THE MAY ISSUE:

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Cyclones

Equipment Focuses

Packaging, Transportation & Storage

Equipment News Roundups

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Petroleum Refining

Facts at your Fingertips

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