CHEMICAL ENGINEERING

UPCOMING FEATURES

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

FEATURE REPORTS

Gasification

Part I Summary: Different gasification technologies produce synthesis gas with varying compositions, and syn gas derived from coal has a different composition than that made from naptha or natural gas. This article will outline the methodology for determining the optimum product for a synthesis gas generation project.

Part II Summary: This article will discuss various coal gasification technologies and cover considerations for the downstream product options in coal-to-chemicals processes.

Related equipment and services: All types of gasifiers and other reactors used for gasification, including counter-current gasifiers, co-current gasifiers, plasma gasifiers, entrained-flow gasifiers, as well as associated processing equipment.

Relevant industries: Gasification is used with coal (coal-to-liquids), as well as biomass and organic waste (municipal solid waste). Gasification also may be used in combined heat and power systems, and IGCC (integrated gasification combined cycle) applications.

Respiratory Protection

Summary: There are a number of standards — some mandatory and some optional — designed to help keep workers in the chemical process industries (CPI) safe through respiratory protection. These include, for example, OSHA and ANSI standards. This article will address what tools are necessary for respiratory protection and compliance with the standards.

Related equipment and services: Respirators and cartridges; other personal protection equipment, such as eye and face shields, hearing protection, gloves, safety shoes and hard hats; consultants and software that aid in personnel safety compliance.

Relevant industries: This article is particularly relevant to industries that handle gases and powders, where respiratory protection is needed. This includes any fine solids handling. It is also relevant across the CPI for maintenance workers who may need to enter a vessel, where even if "hazardous" chemicals are not in use, they may need a sustained air supply.

NEWSFRONT

Simulation

Summary: This month's equipment newsfront will discuss the latest trends and software products related to simulation.

Related equipment and services: Simulation software.

Relevant industries: Simulation is widely used in process design and operation, for operator training and for discovering new processes, in sectors such as petroleum refining, petrochemicals, chemicals and pharmaceuticals.

Send editorial material for consideration to contributing editor, Joy LePree (jlepree@che.com).

CE's 2012 Award Winners

Summary: This article will summarize the 2012 ChemInnovations award winners as well as *CE*'s prestigious 2012 Personal Achievement Award winners.

Related equipment and services: This article is relevant across the CPI.

Relevant industries: Equipment and services related to the award finalists.

FACTS AT YOUR FINGERTIPS

Scrubbers

Summary: This one-page reference guide will provide an outline of ways to optimize the operation of wet-scrubbers that eliminate acid gases from fluegas generated from industrial combustion or power generation processes. It will focus on avoiding problems with mist eliminators, a major driver of cost.

Related equipment and services: Wet fluegas desulfurization

Relevant industries: Many chemical-processing and electric-power operations that involve combustion will generate sulfur-laden fluegas that needs to be scrubbed to meet SOx emissions guidelines.

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.

Relevant industries: This column addresses segments across the entire CPI, and is relevant in the currently booming markets of downstream oil and gas processing.

ENGINEERING PRACTICE

Pigging oil pipelines

Summary: Crude oil products are piped from a pumping station to a receiving facility that may be much lower in elevation than the starting point. In those cases, a pressure control valve can be installed to avoid unsafe pressure buildup, but "pigging" (sending a PIG, pipeline inspection gauge, down a pipe for cleaning and maintenance) a pipe in this situation can be a challenge. This article takes a look at how some of these problems can be overcome, and

illustrates with an example.

Related equipment and services: Pigging equipment, including pigs, "smart" pigs for measuring corrosion, pig tracking systems, launching and receiving systems, piping, valves.

Relevant industries: The article deals with pipeline transport of crude oil, but pigging can also be used in other industries, such as paint, lubrication oil and others.

Avoid Project Failures

Summary: : Companies in the CPI spend billions of dollars every year on capital projects. Most are successful, yielding the desired results. Some projects are only partially successful, in that they are ultimately completed and work as desired, but only after a budget or schedule over-run. And some projects fail completely, never providing the desired results. This article discusses some of the key reasons for project failures. The intent is to assist the reader in recognizing some of the failure modes, so that corrective action can be taken, and project failure can be avoided. It assumes some basic knowledge of capital projects and is intended for the novice project manager or capital manager.

Related equipment and services: Engineering and construction companies; consultants to the CPI; software for cost estimating and project management.

Relevant industries: This article is particularly relevant to engineering and construction companies. It is also relevant across the CPI for companies that are expanding, building new facilities and starting up new product lines.

Batch operations — How to select the best sequencing system

Summary: When configuring a system to produce products in discrete batches, engineers often select the control solution based on the overall size or throughput of the system. It is traditionally thought that smaller batch systems require a controller-based sequencing solution, while larger systems require a server-based solution. However, despite tradition, the size of a system is not the best indicator of an appropriate solution because a small application or single-unit may have complex requirements. For example, a given unit may have hundreds of recipes, making the batch and sequencing beyond complicated when using a hard-coded or controller-based system. This article discusses the options, and provides guidance for how to select the best batch-sequencing system.

Related equipment and services: Controller-based batch-control systems, server-based batch-control systems, batch-control software packages.

Relevant industries: Batch control systems are widely used throughout the chemical process industries, and are particularly widely used as part of pharmaceutical and plastics-processing control schemes.

Practical Notes of CPI Machinery Commissioning

Summary: Startup and piping installation, piping, support, pre-commissioning, commissioning, and start-up of rotating machineries (such as pumps, compressors, gas turbines, steam turbines, turbo-expanders and others) play crucial roles in CPI plants. Machinery maintenance and repair can be quite costly. Probably because of shortage of skilled manpower particularly at remote site locations, CPI plants have given less attention to technical details for machinery installation, piping and commissioning. In general CPI plant piping design, there are rules and practices adopted to facilitate the design and to avoid common errors. More importantly there are usually some special rules or exceptions for CPI rotating machine piping (compared to the general CPI plant piping), if not handled properly these can cause difficulties in the installation and create problem during the operation.

This EP discusses practical advice on installation, piping, support, layout, nozzle loads, stress analysis, pre-commissioning, commissioning, start-up and operation of rotating machines.

Related equipment and services: Pumps, compressors, turbines (gas ands steam), piping, pipe racks, vibration monitoring systems, balancing systems for rotating machinery, and so on.

Relevant industries: Virtually every sector of the CPI will use rotating equipment.

FOCUS

Mechanical Conveying

Summary: Mechanical conveying is used for transporting solids of many different types: from coal, minerals, gravel and sand to chemicals, foods, beverages and packaged goods. They may also be used within a process, such as for transporting catalysts, ion exchange resins and adsorbents, for example. This month's focus will present the latest new products and services available for CPI.

Related equipment and services: All types of mechanical conveyors and associated equipment (belt, bucket, screw, and so on).

Relevant industries: Minerals and mining, food and beverages, pharmaceuticals, chemicals, petrochemicals and plastics, and so on.

Send editorial material for consideration to senior editor, Gerald Ondrey (gondrey@che.com) .

LOOK FOR THESE ARTICLES COMING IN THE JANUARY ISSUE:

FEATURE REPORTS:

How to implement waste heat recovery

Practical guidance on compressed air systems