

FEATURE REPORTS

Dust safety

Summary: Dust safety is an ever-important issue across the chemical process industries. This article summarizes how to assess the potential for a dust explosion, how to avoid them through proper design and also how to protect against the damage and danger that they could present if they still occur.

Related equipment and services: Explosion prevention and suppression devices, feeding and conveying systems, bins and hoppers.

Relevant industries: Dust explosions are a concern with a wide range of materials, including natural organic materials such as grains, cottons, linens, sugar, and so on; synthetic organic materials such as plastics, pigments and pesticides; coal and peat; metals such as aluminum, magnesium, zinc and iron.

Variable frequency drives for centrifugal pumps

Summary: The centrifugal pump is the most widely used pump in the CPI. Running the pump at the optimal speed is one way to ensure energy consumption is minimized.

This article presents an approximate method that gives economic evaluations of low-voltage (480 V) variable frequency drives (VFDs) for typical applications to new centrifugal pump services. The prices of low-voltage VFDs have declined substantially since they were introduced while the cost of power has increased. Normal project economics will now justify these VFDs, which go up to 375 kW (500 HP) or beyond, for pumps over the largest part of the range of application of the pumps. To efficiently evaluate and apply VFDs, process engineers need to know certain elementary things about them. They also need to know about the interactions of pumps and hydraulics when the pumps run at variable speeds. Further economic evaluation beyond the approximate method must be performed, but because low-voltage VFDs require only a small incremental capital investment, their application cannot justify a very detailed evaluation. Usually, screening level economics must be applied and some uncertainty must be accepted.

Related equipment and services: Pumps, centrifugal pumps, variable frequency drives.

Relevant industries: Most sectors of the CPI use centrifugal pumps.

NEWSFRONT

Employment outlook for the CPI

Summary: This article, an annual topic, will take a look at employment trends and workforce issues for workers in the CPI, focusing on what has changed since last year.

Related equipment and services: Not applicable.

Relevant industries: All CPI sectors would be affected by employment trends and by workforce issues, but there are likely to be differences by region and by industry sector.

Pressure measurement and control

Summary: Pressure is one of the key parameters that must be measured and controlled throughout the CPI. This month's equipment newsfront will present the latest in pressure sensors, analyzers and transmitters for pressure.

Related equipment and services: Pressure sensors and transducers, pressure transmitters, pressure gages, data loggers.

Relevant industries: Most applications in the CPI will require the monitoring and control of pressure.

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

FACTS AT YOUR FINGERTIPS

Size reduction

Summary: This one-page reference will explore how to calculate breakage energy for particle size reduction and outline the various types of grinding and milling systems.

Related equipment and services: All types of size reduction mills, including impact mills, roller mills and jet mills, as well as pulverizers and crushers.

Relevant industries: Any process involving solids could have a size-reduction step.

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.

FOCUS

Analyzers

Summary: This Focus section will include short descriptions of recently introduced products for analyzing various process parameters.

Related equipment and services: A wide range of analysis systems for pH, alkalinity, gas and ion concentration, particle size, total dissolved solids, chemical oxygen demand, and others.

Relevant industries: All sectors of the CPI use some sort of analytical equipment in their processes for maintaining quality control and process performance.

For editorial consideration in this section, please send press releases and photos to associate editor Scott Jenkins (sjenkins@che.com).

ENGINEERING PRACTICE

Anti-surge valve selection and sizing

Summary: One of the most significant limitations in the operation of dynamic compressors is the low-flow limit known as "surge." A sudden valve closing, such as for an emergency shutdown, presents significant challenges to anti-surge valve sizing and selection. Anti-surge valve requirements depend to a large degree on the compressor type, the compression system arrangement, and particularly the volume of the discharge piping downstream of the compressor. Important aspects of anti-surge valve sizing and selection for CPI plants are described in this article.

Related equipment and services: Valves and compressors.

Relevant industries: This article is relevant across the CPI.

A primer on chemical-injection systems

Summary: Chemicals are injected into process streams for a variety of purposes. Chemical-injection systems are defined as those systems that are used to introduce select chemicals into the process stream at rates ranging from less than 1% to 5% of the main process stream. Common additives include defoamers, coagulating agents, emulsion breakers, corrosion inhibitors, flocculants, anti-fouling and anti-scaling agents, oxygen scavengers, chelating agents and so on. Such systems typically include sub-systems for chemical preparation, chemical transfer, flow metering and injection. This article provides guidance for designing and operating these systems properly.

Related equipment and services: Chemical storage systems, such as tanks, totes and storage vessels, chemical dosing and injecting systems, flowmeters, positive-displacement pumps (such as piston pumps, plunger pumps and diaphragm pumps) for metering or dosing, injection piping.

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Relevant industries: This article is relevant across the entire CPI, including the industries that are currently in an expansion mode due to increased supplies of unconventional natural gas.

SHOW PREVIEW

ChemInnovations II

Summary: This item is the second part of the ChemInnovations 2012 preview, and will contain short descriptions of products and services that will be featured on the exhibit floor at the ChemInnovations event in New Orleans, La. Nov. 14—15.

Related equipment and services: All products and services of ChemInnovations exhibitors.

Relevant industries: Potentially all sectors of the CPI could be represented at the event, but the focus is likely to be on oil refining and petrochemicals industries that have a large presence in the Gulf Coast and Southeast regions of the U.S.

For editorial consideration in this section, please send press releases and photos to associate editor Scott Jenkins (sjenkins@che.com).

Weftec Show Review

Summary: Products and services presented at Weftec will be reviewed.

Related equipment and services: Water-related products and services, such as filters, membranes, bioreactors, water analysis and more.

Relevant industries: This article is relevant to all CPI facilities.

BONUS DISTRIBUTION:

ChemInnovations, New Orleans, November 14—15

ChemInnovations is the largest US-based show targeting the Chemical Process Industries in 2012. This is the official show issue for the conference and all companies targeting the CPI should be included! All attendees will have the opportunity to see your message before, during and after the show. Don't miss it!

LOOK FOR THESE ARTICLES COMING IN THE DECEMBER ISSUE:

Feature Reports	Equipment Newsfront
Personal Protective Equipment	Simulation
Gasification	
Equipment Focus	Facts at your Fingertips
Mechanical Conveying	Scrubbers