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TOPIC: TANKS AND VESSELS
FEATURE REPORTS
This two-part Feature Report provides practical guidelines for maximizing the operational life of tanks and vessels. Part 1 examines appropriate bolt-tightening techniques, the selection of which depends on bolt size and pressure class of the flange proper. Additionally, guidance is provided to help engineers understand the tightening tools and the bolt load that must be realized during assembly. Part 2 discusses various failure mechanisms for different types of tanks, including those related to roof challenges, nozzle welding, floor-to-wall joints and more. Such failures underscore the necessity for attention to detail in reliable tank operation. The article will also provide guidance on tank installation and inspection procedures.
Related equipment and services: Tanks, vessels, silos, non-destructive testing methods, insulation and more
Relevant industries: Bulk chemicals, petrochemicals, petroleum refining and more

TOPIC: COST ENGINEERING
FEATURE REPORTS
In large capital projects in the chemical process industries (CPI), profitability metrics can provide a basis for comparing the efficiency of investments, but they are often misunderstood. This article uses graphs to illustrate practical interpretations of three different profitability metrics — two standard and one recently developed. Its goal is to help practitioners make informed decisions and to give them the words to explain their results to others.

**Related equipment and services:** Software and other tools or services used for cost estimation, project management, process design and more.

**Relevant industries:** All CPI sectors have an interest in cost engineering

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**TOPIC: CPI WORKFORCE ISSUES**

**NEWSFRONTS**

As in the wider economy, companies across the chemical process industries (CPI) are currently embarking on a “digital transformation” to take advantage of digital tools — such as industrial internet of things (IIoT) connectivity, machine learning, cloud computing, data analytics and many more — in an effort to improve efficiency, reliability and safety of equipment, processes and plants. To achieve a successful transformation, and get the most from their investment in digital tools, companies are realizing that they need to thoughtfully consider the critical role of the workforce in the digital transformation, and the impact of the transformation upon employees. This article will explore some of the ways companies and institutions are addressing the “human side” of the digital transformation for industry workers.

**Related equipment and services:** Digitalization tools, equipment and software, including data analytics, machine learning, IIoT, virtual reality, augmented reality, training tools and software and more

**Relevant industries:** All sectors of the CPI are concerned with digitalization and workforce

Editorial material for consideration should be sent to senior editor Scott Jenkins (sjenkins@chemengonline.com)

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**TOPIC: SIMULATION AND MODELING SOFTWARE**

**NEWSFRONTS**

As computers become faster and more powerful, simulation and modeling software becomes more sophisticated and useful. This month’s Newsfront presents the latest developments in this field.

**Related equipment and services:** Simulation software, modeling software, thermodynamic and other property databases and more

**Relevant industries:** Simulation and modeling is used for both designing and operating plants and process units, such as distillation, crystallization and more in many sectors of the CPI

Editorial material for consideration should be sent to contributing editor Joy LePree (joylepree@gmail.com)

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**TOPIC: AGGLOMERATION AND GRANULATION**
FACTS AT YOUR FINGERTIPS

Agglomeration offers numerous benefits for bulk solids processors, including significant dust reduction, improved handling, more complete utilization of raw materials and densification. This one-page reference provides information on various agglomeration equipment, including on operation and benefits.

**Related equipment and services:** Solids handling equipment, including wet and dry agglomeration equipment, conveying systems, bulk-solids storage containers and tanks, chutes and others

**Relevant industries:** All processes and industries where a solid material would be handled, especially chemicals, agricultural chemicals, biomass, pharmaceuticals, foods, mining and more

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**TOPIC: ETHYLENE OXIDE PRODUCTION FROM ETHYLENE**

**TECHNOLOGY PROFILE**

Ethylene oxide (EO) is the simplest oxide, with a three-atom ring that is formed by the oxidation of ethylene. EO is used in the synthesis of many products and intermediates, such as detergents, solvents, plastics and others. This one-page summary provides information about the industrial productions of EO.

**Related equipment and services:** All process equipment

**Relevant industries:** Petrochemicals, chemicals, specialty chemicals, consumer products, plastics

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**TOPIC: VALVES**

**FOCUS**

Valves are widely used throughout the CPI. This month’s Focus presents the newest valves entering the market.

**Related equipment and services:** All types of valves, actuators, positioners and any other valve-related equipment

**Relevant industries:** All sectors of the CPI use valves

Editorial material for consideration should be sent to senior editor Gerald Ondrey (gondrey@chemengonline.com)

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**TOPIC: WASTE MANAGEMENT**

**ENVIRONMENTAL MANAGER**

Declining resources and increasing energy costs require a more proactive approach to waste management at CPI facilities. Waste minimization can be part of project execution for new-build installations and revamp of existing facilities to make these efforts more efficient. Multi-disciplinary teams can select activities to minimize waste and enhance cost efficiency. Overall, companies that invest in waste minimization as part of a sustainability strategy can financially outperform their competitors. This article provides analysis of waste-minimization strategies and the business case for sustainable waste management.
TOPIC: THERMODYNAMIC MODEL SELECTION FOR PROCESS SIMULATION

ENGINEERING PRACTICE

One of the first and most important decisions to be made when modeling a chemical system using a computer-simulation package is the selection of an appropriate thermodynamic property method. Thermodynamic property methods facilitate the mathematical calculation of pressure, temperature, composition and specific volume, for multi-component and multi-phase chemical systems. They are also used as a basis for determining the state functions of a system, such as enthalpy and entropy and hence, Gibbs free energy. This article provides an overview of the primary thermodynamic property methods, their basis, strengths and weaknesses, and their applicability to various chemical systems.

Related equipment and services: Software for modeling, databases for thermophysical properties, and more. Relevant industries: Thermodynamics modeling is widely used, especially those sectors applying thermal-separation techniques, such as distillation, which is widely used throughout the CPI.
• Direct Mail Improves Multichannel Mix: Report
• 5 Ways to Make Your PR More Effective
• Transforming Customer Experience with Data: 5 Tips