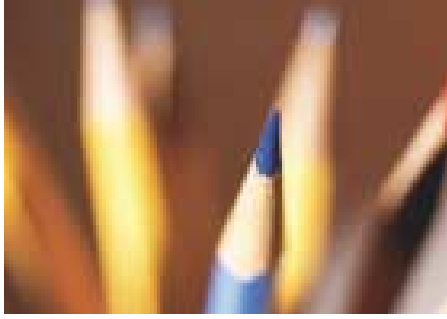
CEP Chemical Engineering Progress

AIChE
American Institute of Chemical Engineers
Three Park Avenue
New York, NY 10016-5991
www.aiche.org

Editorial



The Future is Bright

Acheiving cleaner and more sustainable processes, while saving money on raw materials and capital assets, may seem too good to be true at first glance. However, a review of the technologies that are available today will show that this goal is attainable — if we look to process integration technologies (p. 30).

Process integration has already had a profound effect on the chemical process industries, in the form of pinch technology and heat-exchanger-network optimization. This month's cover article author, AspenTech's Nick Hallale, writes, "Pinch analysis [for energy] has had an enormous amount of application, with thousands of projects having been carried out all over the world. Companies, such as Shell, Exxon, BP-Amoco, Neste Oy, and Mitsubishi, have reported fuel savings of up to 25% and similar emissions reductions, worth millions of dollars per year."

However, he is quick to point out that pinch analysis is not limited to energy. Water pinch, for water and wastewater reduction, has been around for about seven years. Hallale has himself been developing the newest member of the pinch family — hydrogen pinch — which is aimed at helping oil refiners better manage their hydrogen balances. Although new, the technology has already had several applications and also with results worth millions of dollars per year.

Another increasingly popular example of process integration is a dividing-wall column, which essentially integrates two distillation columns into one, thereby eliminating two pieces of capital equipment — the condenser from the first column and the reboiler from the second one. As reported by associate editor Richard Greene from the AIChE Spring 2001 National Meeting in Houston this past April, "UOP is designing and supplying what is believed to be the first dividing-wall column in the U.S." He further noted that UOP's process research specialist, Michael A. Schultz, announced that the column is expected to save 35% in capital costs and 50% in energy expenditures, vs. a conventional two-column setup (*CEP*, June, p. 17). Dividing-wall columns are already operational in Europe and South Africa. Sasol has several units up and running; one of the largest dividing-wall columns was built last year at Sasol's 1-octene purification plant in Secunda, South Africa.

Process integration has much more to offer. As Hallale mentions in his article, "process integration technology now makes significant use of mathematical programming and optimization methods." This results in greater breadth of applications, in areas such as minimization of flue gas emissions and operability of cogeneration and site utility systems. Helping to find industrial applications for these technologies is the Process Integration Research Consortium, a group of 30 major companies that provides financial and technical support for the research program at the Univ. of Manchester Institute of Science and Technology (UMIST; www.cpi.umist.ac.uk). Some of these firms have already developed commercial packages based upon UMIST's research. With the up-and-coming advances being made in process integration technologies, we are headed toward a better, cleaner, and brighter future.

Kristine Chin
Editor-in-Chief
krisc@aiche.org