CCPS Recommends Process Safety Metrics

AIChE's Center for Chemical Process Safety (CCPS) recently published recommendations for a uniform set of process safety management (PSM) metrics. The metrics — which propose industry-wide standards of PSM performance — are available for download from the CCPS website at http://www.aiche.org/ccps.

CCPS began work on the metrics in 2006, shortly after the 2005 explosion at the BP Texas City refinery. In its investigation of that event, the BP U.S. Refineries Independent Safety Review Panel (known as the Baker Panel) noted that well-recognized and generally accepted lagging indicators exist for personal safety, but not for process safety. The Panel went on to recommend that industry develop a consensus set of leading and lagging indicators for process safety performance for use in the refining and chemical processing industries.

"Companies that use the new metrics will be able to collect data about the performance of their process safety management programs at sufficient precision to enable them to track changes in performance over time," says Scott Berger, director of CCPS. "Also, by broad use of a common system of metrics, companies will be able to compare performance and roll up their results to develop overall industry trends."

To ensure that the new metrics were suitable across industries and around the world, the CCPS metrics project involved numerous U.S. and international organizations: The American Chemistry Council (ACC), American Petroleum Institute (API), National Petrochemical and Refiners Association (NPRA), U.S. Environmental Protection Agency (EPA), U.S. Occupational Safety and Health Administration (OSHA), Health Safety Executive of the United Kingdom (HSE), United Steelworkers of America (USW), European Process Safety Centre, and Conservation of Clean Air and Water in Europe.

"With nearly 50 industrial and academic process safety experts from the U.S., Canada, Europe, South America, and India participating in this effort, companies can truly benefit worldwide from these new metrics," said Tim Overton, chief process safety engineer for The Dow Co. and chairman of the CCPS Metric Committee. "If adopted broadly, the new CCPS metrics will be useful to our company by providing a means for benchmarking performance relative to other companies as well as to drive internal improvements to process safety management systems."

L. K. Doraiswamy Receives International Honors

The Indian Institute of Chemical Engineers (IIChE) has presented its inaugural Diamond Award to L. K. Doraiswamy, Anson Marston Distinguished Professor Emeritus in the Dept. of Chemical and Biological Engineering at Iowa State Univ.

According to K. Venkataramanan, president of IIChE, Doraiswamy was honored as "one of the legends whose contributions to the profession and society at large have made IIChE, and indeed all Indian chemical engineers, glow with pride."

The Award was presented during the Diamond Jubilee session of the Indian Chemical Engineering Congress, CHEMCON 2007, Dec. 28, 2007, in Kolkata, India. The honor helped mark the 60th anniversary of IIChE.

Doraiswamy also was honored at the 2007 AIChE Annual Meeting in Salt Lake City, UT. The Catalysis and Reaction Engineering Division sponsored a pair of sessions entitled, "Invited Frontiers in Chemical Reaction Engineering and Catalysis: In Honor of 50 Years of Contributions of L. K. Doraiswamy," on Nov. 6.

"To me personally," Doraiswamy said, "this fall's AIChE special sessions in the U.S., followed immediately by the Diamond Award of IIChE in India, have been particularly satisfying, for they represent recognitions from the two countries that mean the most to me."

Acknowledged as one of the founding fathers of modern chemical engineering in India, Doraiswamy joined the faculty at Iowa State in 1989. He earned a BS in chemical engineering from the Univ. of Madras in India, and a PhD from the Univ. of Wisconsin, Madison. He joined India's National Chemical Laboratory in 1954 and retired in 1989 as the first non-chemist director. His research centers on theoretical and experimental studies in catalytic reactions and reactors, modeling gas-solid reactions, and sonochemical reaction engineering.

He is a past recipient of AIChE's R. H. Wilhelm Award for Chemical Reaction Engineering, and the William H. Walker Award for Excellence in Contributions to Chemical Engineering Literature.

FIRST LEGO League: AIChE Members Help Students Engineer the Future — Building Block by Building Block

Two AIChE members are showing middle school students how to get in gear for a greener future.

John Weidner and Edward Gatzke — chemical engineering professors at the Univ. of South Carolina (USC) — are among the creators of the FIRST LEGO League's 2007 "Power Puzzle" Challenge. The challenge, part of an annual technology competition sponsored by the not-for-profit organization FIRST (For Inspiration and Recognition of Science and Technology), introduces tens of thousands of young people to concepts in scientific thinking and real world problem-solving.

Founded by inventor Dean Kamen, FIRST's mission is to inspire students' interest and participation in science and technology. Using LEGO Mindstorms technologies and LEGO play materials, children aged 9–14 work alongside adult mentors to design, build and program robots to perform intricate tasks in an arena competition. More than 10,000 teams from 38 countries are involved in the Power Puzzle, which this year draws attention to energy management and conservation.

Power Puzzle challenges are underway at more than 300 qualifying events. These culminate at the FIRST LEGO League World Festival and Championship, Apr. 17–19, 2008, in Atlanta's Georgia Dome. Eighty-four teams from 27 countries will compete.

The creation of the Power Puzzle called for the expertise of engineers like Weidner and Gatzke — who not only had the necessary technical knowledge, but had also been long-time participants in LEGO League programs.

Since FIRST LEGO League's (FLL) 1998 inception, the South Carolina state tournament has been was one of the nation's largest. Engineers, college faculty and their students have been among the legion of volunteers needed to run the competitions.

In 2002, the South Carolina Dept. of Education asked USC's College of Engineering and Computing to take over the state FLL tournament. John Weidner, whose own children had been participating in the LEGO League, agreed to serve as coordinator of the 2003 "Mission to Mars" challenge. Weidner soon found himself hooked on the concept.

"It was extremely rewarding to watch 9–14-year-old kids handling real engineering issues of teamwork, time constraints, and technical topics — gears, motors and structures," says Weidner. He coordinated the 2004 "No Limits" competition, which involved engineering solutions to accommodate people with disabilities, 2005's "Ocean Odyssey," which asked students to select a sea resource or human activity, and to trace its impact on the ocean's health, biodiversity and productivity, and 2006's "Nano Quest," where students used LEGO elements to visualize engineering tasks conducted on the micro-scale.

During this time, Weidner asked his USC colleague Ed Gatzke, who had been judging local FLL competitions, to act as his head referee. "I've had fun with LEGO toys since I was a small child. I currently have my children playing with LEGOs," says Gatzke.

Gatzke notes that the LEGO League's focus on robotics and construction may not seem like an obvious fit with chemical engineering, but it does relate to his own process control research. "The students typically run everything in open-loop, rarely using sensors," says Gatzke. "But at least they are getting exposure to technology in a fun and creative way."

When FIRST wanted to develop an

energy-themed challenge, John and Ed were a logical choice for the design team. "FIRST knew that we were passionate about the program," says Weidner, "and when they heard that Ed and I perform research on fuel cells and hydrogen, they asked us to help design Puzzle Power. Our role was to provide the underlying technical foundation and context for the game. We came up with the main themes — how to create sustainable options to meet our planet's growing energy needs in a way that is good for the environment. Hopefully the challenge is exposing students to many of these options — some simple, like growing biofuels, and others futuristic, such as solar panels in space."

Gatzke adds, "I hope that the puzzle will get people to think about trade-offs related to energy choices, and expose them to concepts of energy production, conversion, and storage."

Since 2002, Gatzke and Weidner have seen South Carolina LEGO League participation grow from 50 to 140 teams, making it one of the model programs in the U.S. "We want this to be in every elementary and middle school throughout the state," says Weidner.

The tournament experience is also great fun. "FIRST designed this competition as 'Sports for the Mind,' so it is as loud and exciting as any sporting event," says Weidner.

Photos of South Carolina State FIRST LEGO League competitions, courtesy of John Weidner.

The competitions require lots of volunteer support. "Tournaments need referees, judges to watch team presentations and examine robots, technical support to assemble the playing fields, and wranglers to get teams in the right place at the right time," says Gatzke. "Before the tournament takes place, volunteers can help build the tournament tables, assemble the challenge, or even coach a local team."

One LEGO League fan is AIChE past president Bill Byers, who has been volunteering as a regional judge in Oregon. "I particularly like FIRST's core value of instilling 'gracious professionalism' in young people," says Byers. "That's a concept that can't be started too early."

The next LEGO League challenge — devoted to the environment — will be announced in September 2008. Like the Power Puzzle, the environmental challenge should provide a good fit for chemical engineering insight.

To learn about FIRST LEGO League competitions and opportunities for involvement, visit www.firstlegoleague.org.

Jae W. Lee Receives Grant to Study Process Intensification

STX Co., Ltd., a South Korean energy conglomerate, has awarded $1.2 million to Dr. Jae W. Lee, associate professor of chemical engineering in the Grove School of Engineering at The City College of New York (CCNY), for a five-year research assignment. Professor Lee will investigate "Process Intensification by Integrating Reaction and Separation."

Process intensification is a sustainable engineering method for simplifying complex processes. It can generate dramatic economic savings and yield environmental benefits, such as reductions in emissions and use of volatile organic compounds.

"We want to simplify a complex process with many tasks including mixing, separation and reaction," Lee said. "If we are able to combine the tasks into one unit, we can get a synergistic effect. But, to achieve synergies we first need to understand the thermodynamic and kinetic principles behind the tasks."

Lee plans to conduct computer simulations to develop hypotheses about how multiple separation and reaction tasks behave in combination. He will also conduct experiments with different equipment configurations to confirm the simulation results.

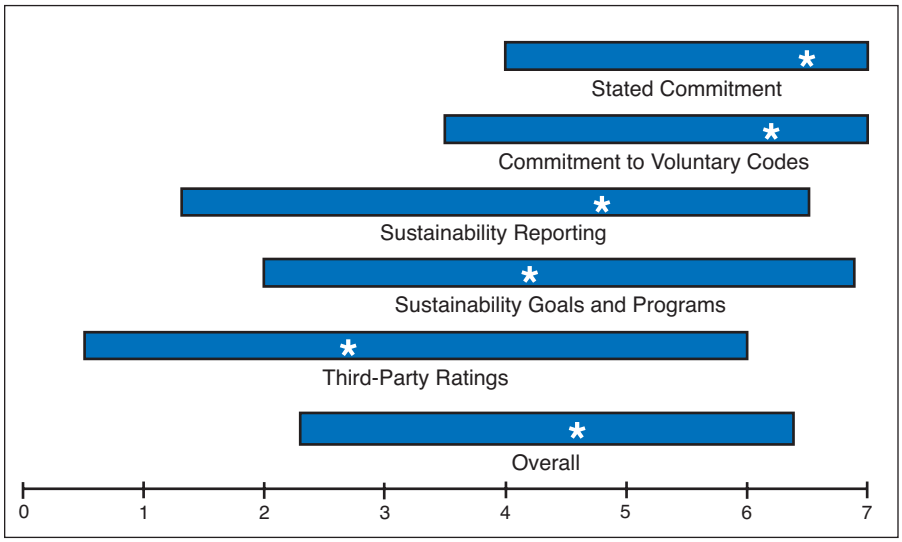
"The goal is to develop a fundamental algorithm that can identify synergies," he said, adding, however, that combining multiple reactions and separations is "mathematically very difficult."

Lee, whose area of expertise is reactive separation and gas hydrate separation and storage, has taught at CCNY since 2001. He holds BS and MS degrees from Seoul National Univ. in South Korea and earned his PhD from Carnegie Mellon Univ. in 2000.

Prior to joining the CCNY faculty, he was an Alexander von Humboldt Research Fellow from 2000 to 2001 at Aachen Technical Univ. in Germany. In addition, he was a research engineer with S-Oil Refining Co. in South Korea from 1992 to 1997.

Lee is a member of AIChE, the American Chemical Society and the Korean Institute of Chemical Engineers. He has authored or co-authored more than 40 journal articles.

AIChE Sustainability Index: Strategic Commitment to Sustainability



The AIChE Sustainability Index (SI) (*CEP,* Nov. 2007, p. 13, and Jan. 2008, p. 20) assesses sustainability of companies in the chemical industry with respect to strategic commitment, environmental performance, safety performance, product stewardship, social responsibility, value-chain management, and innovation. In this issue, we examine strategic commitment to sustainability based on five criteria (not all are weighted equally):

- *Stated Commitment* — public commitment to excellence in environmental and social performance throughout a company's value chain
- *Commitment to Voluntary Codes* — public commitment to voluntary codes and standards, including Responsible Care, Global Compact, and others
- *Sustainability Reporting* — timely and comprehensive public reporting of sustainability performance
- *Sustainability Goals and Programs* — comprehensive set of goals and programs that are specific and challenging
- *Third-Party Ratings* — other respected agencies' ratings of company-wide sustainability management and reporting.

The figure shows average scores (asterisks) and ranges (blue bars) for the eleven major chemical companies* included in the inaugural analysis. On average, the companies received high marks in Stated Commitment and Commitment to Voluntary Codes, and lower scores in Sustainability Reporting and Sustainability Goals and Programs. The companies also scored somewhat poorly in economy-wide Third-Party Ratings (such as the Dow Jones Sustainability Index and FTSE4Good). The ranges, however, show considerable gaps between the top and bottom performers under each criterion.

All of the major chemical companies in this analysis have made public commitments to some aspects of sustainability, and nine out of the eleven evaluated have extended these commitments beyond internal environmental, health and safety (EHS) performance and product safety to include resource efficiency, product environmental performance and supplier performance. Nevertheless, commitments need to be supported by systems in place, including accountability through public reporting and clear targets and initiatives. While a few of these companies have published well-respected, award-winning sustainability reports, many remain limited to reporting internal EHS performance and anecdotal success stories. Only a handful of chemical companies have developed clear and comprehensive sustainability targets.

The AIChE SI provides practical benchmarks along a number of well-defined metrics. Individual companies can subscribe to the indexing service to learn how they compare their peers by contacting ifs@aiche.org.

*The initial analysis included: Air Products, Akzo Nobel, Ashland, BASF, Celanese, Dow, DuPont, Eastman, Lyondell, Praxair, and Rohm & Haas.

Youngblood Elected Law Partner

William C. Youngblood, an AIChE member in Philadelphia, PA, has been elected to partnership in the law firm of Caesar, Rivise, Bernstein, Cohen & Pokotilow, Ltd.

Youngblood's practice focuses on intellectual property litigation, including the preparation and prosecution of patent and trademark applicaitons. His clients range from pharmaceutical companies to small businesses and individual inventors. Prior to joining Caesar Rivise, he served on active duty for five years in the U.S. Navy and is currently a Major in the U.S. Army Reserve serving as a Judge Advocate.

Youngblood earned his undergraduate degree in chemical engineering degree from Drexel Univ. in 1988, and his law degree from Temple Univ. in 1998. He is past-chair of AIChE's Delaware Valley Section, and a member of the Management Division.

President's Message — Are We Communicating?

A colleague asked if I had read a news note in *AIChExchange*, the Institute's monthly e-newsletter. I said that I had not — because I did not receive *AIChExchange*. As the newly elected president of the organization, I thought I should find out why.

I learned that I was not receiving *AIChExchange* because I had selected the e-mail opt-out option on a prior membership renewal form. I incorrectly interpreted that box as the way to decline receiving e-mail from third parties.

Perhaps you made the same assumption — in which case, you could be missing out on valuable information from AIChE. If that's so, and after reading the explanation in the box at the right you would like to receive *AIChExchange* and other communications by e-mail, please contact xpress@aiche.org to become a subscriber.

This experience provides an opportunity to invite your recommendations on how we can best communicate with you. What would be the key elements of a communication strategy that would meet your needs? What types of information do you want to receive? What would you find most useful? How do you want that information delivered to you? How can AIChE communicate more effectively with you and ultimately serve you better?

Send your comments to president@aiche.org.

—Dale Keairns
2008 AIChE President

AIChE's E-mail Policy

Bette Lawler, Director of Operations, said that AIChE's e-mail policy aims to strike a balance. "From a cost perspective, e-mail is the most efficient — and timely — way to communicate with members. So I think there's a natural tendency to gravitate towards using it. At the same time, we want to respect the member's in-box and not be viewed as another spammer."

Lawler noted that AIChE erred on the side of caution. Her team canvassed the practices of other professional associations and attended seminars on e-mail from legal issues to best practices. They also spoke with members at national meetings.

The result, she said, is an e-mail policy that members can rest easy about. "At the Board of Directors level, AIChE committed to never renting or sharing e-mail addresses with any third party. And that protection isn't just for members — it applies to anyone who provides the Institute with their e-mail address. At the operational level, we established a policy of no more than one mass e-mail message a day. One means one whether we're reaching 300 members or 30,000."

Lawler said that about 75% of AIChE's nearly 40,000 members had provided e-mail addresses. "Members can always opt out of receiving e-mail," Lawler said. "But we hope they don't. There just isn't a better way, for example, to let the membership know about the 15 to 20 timely items that appear in *AIChExchange* every month."

Members wishing to ensure they are receiving AIChE e-mail should contact xpress@aiche.org and ask to receive AIChE e-mail.

BHATIA RETIRES FROM DUPONT

Kamlesh K. Bhatia, Research Fellow at DuPont Central Research and Development, and an active AIChE leader, retired from DuPont in December 2007 after more than 34 years of service.

Bhatia joined DuPont in April 1973 in the Industrial Chemicals Department and transferred into Research and Development in 1992. During his career, he made significant contributions to several businesses through improvement of existing processes and invention of new processes.

He is a long-time contributor to Institute life. He is involved in AIChE meeting programming, and is a founding member of the Institute's Process Development Div. He is also a member of the Wilmington Local Section, and has arranged corporate support for AIChE student programs. In 2005, he was elected as a Fellow of AIChE.

The holder of 33 U.S. patents, Bathia has been recognized with AIChE's Process Development Practice Award, and the Chilton Award for Excellence in Chemical Engineering. He has served on the Univ. of Florida Chemical Engineering Advisory Board for over 15 years.

Additionally, his four adult children have earned PhDs in engineering. Surita (past chair of AIChE's Women's Initiative Committee) and Sujata are chemical engineers (*CEP*, Sept. 2003, p. 80); Sunita and Krishnan are electrical and mechanical engineers, respectively.

In Memoriam — Rebecca M. Hernandez

Rebecca M. Hernandez of Princeton, NJ, a young AIChE member, was killed on December 28, when the minivan she occupied with her husband and several friends was struck by an alleged drunk driver on New Jersey's Interstate 95. The couple and their friends were returning from a ski trip in the Pocono Mountains when the accident occurred.

The collision also claimed the lives of two passengers who had been visiting from Puerto Rico. Hernandez's husband, Ricardo Sanabria, was injured but survived.

The crash also killed the offending driver, whose pick-up truck had entered I-95 against the flow of traffic. An open container of alcohol was found in the truck.

Hernandez, age 28, was the daughter of Dr. Edgar Hernandez of Cabo Rojo, Puerto Rico. Dr. Hernandez is a chemical engineer and chair of AIChE's Puerto Rico Local Section.

A memorial service and funeral for Rebecca was held in Cabo Rojo on January 3.

Hernandez was born in Baton Rouge, LA, in 1979, and raised in Cabo Rojo. She graduated with honors from the Univ. of Puerto Rico at Mayagüez in 2002.

She began her career in the Technical Services Dept. of Bristol Myers Squibb in Mayagüez. In 2005, she was relocated to the Research Laboratories of Bristol Myers Squibb in New Brunswick, NJ., where she was responsible for the technology transfer of products to manufacturing sites.

Edgar Hernandez said that, while working for Bristol Meyers Squibb, his daughter was pursuing a doctorate in chemical engineering at Rutgers Univ. "She was very talented, with a great career," said Hernandez. "She loved her job."

Like her father, Rebecca not only pursued a career in chemical engineering, but involved herself in AIChE activities. She was a member of the New Jersey Local Section and the Institute's Society for Biological Engineering (SBE).

AIChE Conference Calendar

For information and registration details, visit www.aiche.org/conferences or call Customer Service at 1-800-242-4363 or 1-203-702-7660 (outside the U.S.)

The 3rd SPE/AIChE Joint Workshop: Practical Strategies for Managing CO_2 Emissions — Today, Not Tomorrow
February 25–26, 2008 • The Fairmont Sonoma Mission Inn and Spa • Sonoma, CA

2008 AIChE & ACS Spring National Meetings and Exhibitions
April 6–10, 2008 • Ernest N. Morial Convention Center • New Orleans, LA

2008 Process Development Symposium: Chemical Product Engineering — The Third Paradigm
June 22–25, 2008 • Jiminy Peak Resort • The Berkshires, Hancock, MA

SBE's 4th International Conference on Bioengineering and Nanotechnology
July 22–24, 2008 • University College, Dublin and Stillorgan Park Hotel • Dublin, Ireland

2008 Ammonia Conference
September 7–11, 2008 • Hyatt Regency • San Antonio, TX

2008 AIChE Annual Meeting
November 16–21, 2008 • Philadelphia Marriott & Pennsylvania Convention Center • Philadelphia, PA

OBITUARIES

Charles M. Clarke, 85, Meriden, CT

William W. Erskine, 80, Lowellville, OH

William H. Fuhr, 85, Issaquah, WA

George B. Irving, 69, Moscow, ID

Frank A. Jorgensen, 91, Louisville, KY

Akira Mazume, 82, Tokyo, Japan

Charles E. Reed*, 94, Bridgeport, CT

*Fellow