Letter from Larry Evans, 2007 AIChE President

Laying the Groundwork for the Next Century

It was a privilege serving as your president this past year as AIChE began its 100th year as the leading professional society serving chemical engineers. 2007 was a very good year for AIChE. Financially, we continue to show positive results. In fact, we're forecasting a profit approaching $3 million on revenues of about $19 million. This performance means we will have more than $7 million in net assets, and be well on our way toward building a reasonable level of reserves. For the second consecutive year, we can report growth in membership. Thanks to the hard work of the leaders who preceded me, I believe we can now decisively declare success with our financial turnaround.

It was a good year, too, from an operational viewpoint. We had solid meetings attendance in both Houston and Salt Lake City. The number of companies joining the Center for Chemical Plant Safety (CCPS) broke 100 for the first time. We had record advertising sales in *CEP*. And, we signed an agreement with John Wiley &Sons, renewing and extending our highly successful publications partnership.

We launched the Student Membership Initiative, with a goal of creating closer ties among undergraduate students, industry and AIChE. Under this new program, we're providing free student membership to every chemical engineering undergraduate in the U.S. The cost of the program is being funded by corporate sponsors who enjoy special access to students and faculty advisors at participating institutions, as well as increased visibility at AIChE events. A number of leading companies have already signed on as sponsors, including BP, DuPont, Merck, and Rohm & Haas.

The past year was also a good one for practicing chemical engineers. We continue to command the highest starting salaries of any engineering discipline, and our salary survey shows that average compensation is at its highest point. But our work isn't just important for its financial rewards. Chemical engineers are at the forefront of addressing critical challenges facing the world in areas such as: energy, greenhouse gases, water availability, sustainability, and biotechnology.

Strategy for the next century

Earlier this year, the Board of Directors commissioned a major review of the Institute's long-range strategy to be announced as part of our centennial in 2008. There are compelling reasons why such a review is critical as we prepare to enter our second century as a professional society.

First, the external world is changing and we need to adapt. Globalization is changing the marketplace for chemical engineers and the nature of the work we do. The discipline of chemical engineering is changing as academic departments embrace the application of biology and as product development becomes equal in importance to process design. And, the role of professional societies themselves is changing as engineers rely on other sources for technical information and interaction with their peers.

Second, the last review of our strategy was focused on securing AIChE's survival in the face of serious financial challenges. At that time, the Board implemented the "Essential AIChE" strategy, with a greatly reduced budget and staff. This strategy proved successful. Now, it's important to develop a strategy to show how to succeed and grow in the future.

Third, a clear, consistent strategy is needed to guide the operating decisions we make. Without an agreed-upon strategy these decisions would be made *ad hoc*.

To create the new plan, more than 50 thought-leaders, representing the diversity of the profession, were organized into six working groups to prepare white papers on:

- What do chemical engineers want?
- How is the marketplace for chemical engineers changing?
- How is the discipline of chemical engineering changing?
- How are professional societies changing?
- How can chemical engineers best impact societal issues?
- What can we change about AIChE?

A project steering committee has guided the study and prepared a draft of the strategy. The strategy provides specific goals and plans for addressing: globalization, diversification of the profession, impact of web-based technologies, achieving a societal impact; restructuring of the chemical engineering curriculum, and evaluating AIChE's business model for the long-term. We plan to solicit comments from all AIChE members through web-based discussion forums early in 2008. I encourage all of you to join this discussion.

On June 8, 2008, AIChE will enter its second century as a professional society. We plan to celebrate the centennial with a year-long set of activities culminating in the annual meeting next November in Philadelphia, where AIChE was founded. As we look to the future, I'm confident that chemical engineering will be even more important in our next century than it was in the past; that the Institute is healthy and strong; and that we will have a clear strategy for success.

2008 ELECTION RESULTS

The Tellers have examined the votes for candidates for Officers and Directors of the Institute and have declared the following to be the results of the election:

President

Dale L. Kearns

President-Elect

H. Scott Fogler

Treasurer (2008–2010)

Frederick J. Krambeck

Directors (2008–2010)

Jennifer Sinclair Curtis
Gavin P. Towler
John C. Tao
Phillip R. Westmoreland

9th Annual ChemE-Car Competition

Shoebox-Size Vehicles Spark Excitement

by Gordon Ellis

At the 9th Annual AIChE National ChemE-Car Competition (Nov. 4; Salt Lake City, UT), held in connection with AIChE's Annual Meeting and National Student Conference, household kitchen goods reigned supreme over basic laboratory materials and fuel cells. A mixture of baking soda and vinegar propelled a team of students from New York City's Cooper Union to victory. This seems quite fitting, since Cooper Union's founder, Peter Cooper, not only designed and built America's first steam railroad engine, but also developed instant gelatin — Jello — which can now be found in many kitchen pantries.

In the competition — held at nine regional and one national site each year — teams of undergraduates design shoebox-size vehicles, powered by chemical reactions to carry a variable load over a variable distance. Teams learn the target distance and load one-hour before the competition, and then calculate the appropriate reaction to propel and stop their car as close to the finish line as possible. After the first heat, teams have an opportunity to recalibrate and improve their performance in the second round.

Twenty-nine teams — top-finishers at Spring 2007 regional competitions — competed in Salt Lake City. The target distance at this year's National Competition was 67 ft, and the load was 350 mL of distilled water.

Cooper Union's "Shooter" car took first prize ($2,000), stopping only four inches shy of the target distance in its best run. By a razor-thin margin, Carnegie Mellon University's "Kiltie Kar" finished second (for a $1,000 prize), only one-half inch short of Cooper Union's best mark. The vehicle was powered by a copper-zinc battery and stopped by a magnesium ribbon-hydrochloric acid reaction.

The University of Oklahoma, which was once disqualified from a previous competition for safety concerns, achieved redemption in 2007 — winning third place (taking home $500) by stopping eight inches from the mark in its best run. Its car, "Windmills Work this Way," ran on the catalytic decomposition of hydrogen peroxide using potassium permanganate. The gases generated from the reaction were piped into an aluminum turbine, driving the car through a system of gears.

Louisiana State University finished fourth, with its striking four cylinder stainless steel and aluminum design. LSU's vinegar and baking soda-fueled "Take It To The Limit" car boasted several awards, including Most Consistent Performance (with distances of 17 in. and 20 in.), a Safety in Design Award, the Most Creative Drive System Award, and the Golden Tire Award for "fan favorite" — as voted upon by the other competing teams.

During the preliminary Poster Competition and car safety inspections, the University of Minnesota's poster for "Gopher 4.0" won first prize. Minnesota also received a Safety in Design Award. Second and third prize in the Poster Competition were awarded to the University of Puerto Rico and Kansas State University, respectively.

The 2006 champions from University of Puerto Rico took consolation in a Spirit of the Competition Award for best team spirit. More than 100 students from Puerto Rico attended the event to cheer on their team.

One footnote of interest — out of the 29 cars, many of which were driven by fuels cells or simple chemical reactions (*e.g.,* sodium bicarbonate plus acetic acid), none of them used a biological reaction. As a result, the Society for Biological Engineering's (SBE) $1,000 prize for the Best Use of a Biological Reaction to Power a Car could not be awarded to any team.

Top 3 Performers
1. Cooper Union
2. Carnegie Mellon University
3. University of Oklahoma

Most Creative Drive System
Louisiana State University

Most Consistent Performance
Louisiana State University

Spirit of the Competition
University of Puerto Rico

Top 3 Posters
1. University of Minnesota
3. University of Puerto Rico
2. Kansas State University

Inherent Safety in Design
University of Minnesota
Louisiana State University

Golden Tire Award
Louisiana State University

Board of Directors Honors Safety Task Force

Prior to the ChemE-Car Competition, AIChE's Executive Committee presented the Institute's Gary Leach Award to the ChemE-Car Competition Safety Task Force, whose members made valuable recommendations and created new programs to help ensure the safety of students participating in the competition. The Gary Leach Award recognizes the activities of an AIChE group whose performance shows significant accomplishments toward the Institute's mission and objectives. Ronald J. Willey of Northeastern University (photo, right), the Task Force coordinator, received special acknowledgement for his generous volunteer contributions.

Over the past two years, the Task Force's review of the competition's design and operation produced new safety rules and programs, including: mandatory training sessions; new safety inspection standards; and job safety analysis reviews for each car.

In Memoriam — Gary J. Powers (1945–2007)

Gary Powers touched the lives of thousands of students at Carnegie Mellon Univ., where he served as a professor of chemical engineering for more than 30 years, until his death July 23, 2007. One of the most popular and well-liked professors, he was a frequent recipient of the Kun Li Award for Excellence in Education, which is given each year by the graduating class to an outstanding chemical engineering professor.

In the introductory chemical engineering course, he emphasized concepts of process synthesis and invention of process flowsheets, peppering his teaching with real examples. "A favorite process I recall was 'soy beans to bacon bits,'" says Annette Jacobson, a professor at CMU and one of the many students who became chemical engineers as a result of Powers' influence, enthusiasm and encouragement.

In recent years, Powers introduced his freshman students to AIChE's ChemE Car challenge, in which students design a car and its fuel system so that the car will stop at an exact location that is specified just before the beginning of the competition. To make the experience more authentic, he once tried to borrow a race-car driver suit to wear to the competition. At CMU, he expanded the contest by allowing students the option of designing a boat and racing it in a huge trough of water set up on the lawn outside Doherty Hall.

Powers created unique laboratory activities for undergraduates that emphasized process safety and environmental risk assessment, and used engineering fundamentals to address process and product development problems. A recent project that he developed in the unit operations lab was the production of polylactic acid from corn, which the seniors truly enjoyed.

Assistant professor John Kitchin, who now teaches the lab course, admits that he has huge shoes to fill. "Gary had tremendous vision, setting up totally open problem-based lab projects where the students define for themselves how the lab is run," he says.

Powers was unique in getting to know his students well. On the first day of class, he took a photo of each student holding a name card. (Back in the day, these were Polaroid snapshots.) By the second class, he could recognize all of his students by name and face. Department head Andrew J. Gelman shares the secret Powers' daughter Becky revealed at her father's memorial service: In the evening after dinner, his kids used the photos like flashcards to quiz him on the names until he could remember them all by heart.

"Most teachers don't take the time to learn their students' names the way Gary did," points out Donald R. Woods, professor emeritus at McMaster Univ. in Hamilton, Ontario, who was a colleague of Powers' during two research stints at CMU. "He was always so enthusiastic about helping students learn."

"I think what really attracted the students was his very genuine and charismatic nature — he was just having a great time while doing work that he loved," Jacobson says. "As for the freshman class photos, he kept them all. When alumni returned to visit, he would bring out the album, so they could check out that freshman picture and reminisce about the good old days!" He also remembered former students he encountered at AIChE meetings, even many years later.

"Gary's teaching philosophy reflected a blend of his extensive industrial and academic experience. He combined a mix of theory and practice, with a special focus on the student using his or her own creativity and ingenuity," Jacobson continues. "He instilled confidence in his students, which resulted in the students developing confidence in themselves and their abilities. He expected a high level of dedication and motivation from his students, just as he did from himself. A quote by Albert Einstein sums up Gary's teaching philosophy: 'Example isn't another way to teach, it is the only way to teach.'"

06-101 Intro to Chem Engr, Fall 1976
Photo by Michael Domach

Powers was also a leading researcher who did pioneering work in process risk assessment and in process synthesis. As a PhD student at the Univ. of Wisconsin, he worked with Jeff Siirola to develop the first automatic synthesis program for process flowsheets using artificial intelligence techniques. He co-authored, with Siirola and Dale Rudd, the first text in this area, "Process Synthesis." He developed new methods for generating fault trees for quantitative risk assessment, and successfully applied those methods in industry. For his contributions in the safety area, he received the 2005 AIChE Norton H. Walton/Russell L. Miller Award in Safety/Loss Prevention.

Powers earned a BS from the Univ. of Michigan in 1967 and a PhD from the Univ. of Wisconsin in 1971. He served on the faculty of MIT before joining Carnegie Mellon in 1974. He is survived by his wife Susan, six children, and five grandchildren. He enjoyed fishing, and made many trips to northern Canada with colleague and friend, professor Michael Domach.

An undergraduate scholarship will be established in Powers' memory. Donations may be sent for the Gary J. Powers Scholarship Fund, c/o Toni Mciltrot, Dept. of Chemical Engineering, Carnegie Mellon Univ., Pittsburgh, PA 15222-5488.

Cindy Fabian Mascone, CMU Class of 1980

Joseph J. Santoleri Honored for Pioneering Contributions to the Waste Management Industry

This past May, the American Society of Mechanical Engineers awarded AIChE member, Joseph J. Santoleri, the IT3 Pioneer Award at the 26th Annual Conference on Incineration and Thermal Treatment Technologies (IT3) in Phoenix, AZ. Santoleri was honored with this award for his lifetime of outstanding and pioneering contributions to the science and technology development of the waste management industry, including practical implementation of state-of-the-art knowledge in the design and advancement of waste incinerators and heat-recovery systems, technical leadership in professional societies, service to industry and the distinguished role as educator and researcher.

Santoleri's career spans 60 years starting as a co-op student from Drexel Univ. in 1947 and presently as a consultant in the combustion, heat transfer, incineration and air-pollution control field. After graduation as a mechanical engineer from Drexel in 1950, he began his career as a fuels engineer at Lukens Steel Co. in Coatesville, PA. From 1951 to 1953, he served as an equipment maintenance officer in the U.S. Army Corps. of Engineers, with one year in Korea in a combat engineering company.

Santoleri continued in the combustion field at Thermal Research & Engineering Corp. (TRECorp; Conshohocken, PA). He combined the combustion background with highly specialized heat-transfer analysis for design and development of fired heaters, waste-heat recovery and liquid-natural-gas vaporizer applications in industry. His 30 years at TRECorp, Trane Thermal, now known as Selas-T-Thermal, included development, engineering, sales and management. He was VP & GM in his last 10 years at Trane Thermal.

His background in development, design, applications, manufacturing, field testing and startup enabled him to provide consulting services to industry and government as a principal consultant at Four Nines, Inc., which he founded in 1984. The company was purchased by RMT Inc., in 1983, where he continues part-time consulting.

He has trained regulators, engineers and operators in applications involving waste disposal systems, new or modified incinerators, kilns, industrial furnaces, boilers, and VOC oxidizer systems. He has served as peer reviewer for U.S. EPA for guidance manuals and new regulations covering the hazardous waste combustion systems. Santoleri was responsible for the design and start up of more than 150 incineration systems in the U.S. that included halogenated hydrocarbon systems.

Santoleri is a registered professional engineer in Pennsylvania. He has presented over 100 technical papers at engineering conferences, contributed to over seven texts, including "Perry's Chemical Engineering Hand-book," 7th and 8th editions, and co-authored the 2nd edition of "Introduction to Hazardous Waste Incineration" (Wiley, 2000).

OBITUARIES

Roy O. Ball, 62, Bannockburn, IL

Ronald A. Cole, 66, Seattle, WA

Harry L. Frisch, 79, Albany, NY

Carl H. Gamer*, 92, Franklin Lakes, NJ

Elihu D. Grossmann, 80, Philadelphia, PA

Donald H. Henderson, 83, Kerrville, TX

Cecil Phillips, 89, Baytown, TX

Roy P. Whitney*, 94, Seattle, WA

*Fellow

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.)

2008 SBE's International Conference on Stem Cell Engineering
January 20–23, 2008 • Coronado Island Marriott Resort • Coronado, CA

2008 Spring National Meeting
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

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