



DIRECTOR'S CORNER

The Center continues to make progress in accomplishing its mission. We are indeed very grateful for the support and assistance we receive from our friends in helping us meet our mission.

Since 1997, Center expenditures have increased from about \$50,000 in 1997 to about \$600,000 in 1999. Funding comes from various sources including the O'Connor endowment, consortium funding, contract projects, symposia, and Continuing Education. The Center's financial growth is expected to continue with an estimated \$800,000 to 900,000 in expenditures this year. Center personnel include 32 employees, many of whom are part-time. The Center is collaborating with the Mechanical Engineering Department in developing an Aerosol Laboratory.

Overall, the Center graduate research programs are making tremendous progress. Currently graduate students are involved in the following research projects:

- Fahad Al-Qurashi is working on the design of a relational database, which will permit data comparisons and exhibit trends in chemical process safety. Also, he will help construct databases of reactive chemical information that will be linked with the Center website.
- Lizbeth Cisneros is measuring the behavior of hydroxylamine thermal decompositions using adiabatic calorimetry.
- Michela Gentile is working on an index to quantify inherent safety for use in industrial design.
- Kiran Krishna is working on the development of a model for the effect of aerosol droplet size on upper and lower aerosol flammability limits.
- Sanjeev Saraf is developing models for prediction of chemical reactivity for systems that are studied in the Center Reactive Systems Laboratory.
- Christina Sposato is using FLUENT computational fluid dynamics software to

model silane release behavior in the presence of obstacles or barriers.

- Passaporn Sukmarg is measuring particle size distributions in heat transfer fluid aerosols.
- Yanjun Wang is analyzing failure rate for quantitative risk assessments of chemical processes. With the objective of determining sufficiency in safety integrity levels, she will use publicly available databases of incidents that occurred because of process safeguard failures.
- Yifeng Zhou is developing a quantitative model to simulate Abnormal Situation Management.

As research results become available, summaries will be provided in future newsletters.

Preparations for the 2000 Annual Symposium are proceeding according to plan. Starting this year, the Symposium has been moved to the more spacious Reed Arena on the Texas A&M campus. The Symposium will be held on October 24-25, 2000. Dr. Trevor Kletz is returning as the keynote speaker for the first day. On the second day, Mr. Dave D'Antoni, Senior Vice President of Ashland, Inc. will provide the keynote.

Dr. Nick Kazantzis, recent addition to the chemical engineering faculty is collaborating with me in developing a project on Abnormal Situation Management. Chemical Engineering is dominated by nonlinear processes, safety instrumented systems can be too conservative, and more flexible control and monitoring systems for these processes are needed. If a system is subjected to a nonlinear upset, the system can be brought back to steady state in a rapid and consistent manner. Process dynamic modes are identified and "soft sensors" are used for detecting and controlling upsets. A process with an unstable steady state region can be driven to the middle steady state region by controlling around the region with a cubic regulator. The linear control loop is not effective for this application. A future goal is a unified framework for process control.

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