AIChE[SM] section Chicago Columns

Chicago Section
American Institute of Chemical Engineers
www.aiche-chicago.org

May Meeting Notice

May 12, 2004
Hackney's
1514 East Lake Street
Glenveiw, Illinois 60025

Menu
Choice of:
Top Butt Steak - A thick and juicy eight ounce top butt steak, served atop a bed of our Original French Fried Onions, and topped with sautéed mushrooms and served with backed potato;

Grilled Chicken and Fresh Asparagus over Penne Pasta - Grilled chicken breast julienne and fresh asparagus served over a bed of seasoned penne pasta - Served with garlic bread and parmesan cheese.

Broiled Orange Roughy - A tender deep-sea fish from New Zealand, served with new potatoes, homemade tartar sauces, and lemon.

The Famous Hackney Burger - The Famous Hackney Burger uses the finest ground beef. Served on dark Rye or bun; with Hackneys Cole Slaw prepared daily and French fried potatoes.

All of the above entrees include a tossed green salad.

Agenda
Cash Bar.....5:00pm
Dinner.....6:30pm
Speaker.....7:00pm

Cost
$20 dollars for members
$22 for non-members
No charge for AIChE student chapter members
(See your advisor)

Reservations
Make your reservations by calling the AIChE Reservation Hotline at 847-588-3323 or emailing evalopez@teianalytical.com.
Or register online at www.aiche-chicago.org.
Deadline is noon May 7, 2004.

Topic: Simple Solutions to Some Common Capital Project Management Mistakes
Most chemical engineers get involved in capital construction projects at some point in their career. The most common capacities are as a project manager, a project sponsor, or a project team member. Most of us have seen how difficult it is to do a project well.

This difficulty is tied to three important facts about project management that are not generally recognized in our industry. The first is that Project management is a legitimate field of its own. Masters degrees are now awarded in project management. There is even an ANSI

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standard on project management called the PMBOK (Project Management Body of Knowledge) written by the Project Management Institute (PMI). The Project Management Institute also offers a certification called the PMP (Project Management Professional). Several thousand hours of professional project management work in industry, as a project manager, are required before the PMI will let a candidate take the written test to qualify as a PMP. After successfully completing the four-hour, two hundred-question test, the candidate is awarded the PMP.

The second important fact is that a project manager cannot manage well a project whose subject matter he does not understand. The information obtained from the PMBOK is general and still must be translated into applicable action for the situation at hand. This can only be done if the project manager is intimately familiar with the work to be performed. In addition, a project manager wears several hats, as a leader, a planner, a delegater, a coach, an expediter, a problem solver, and a progress reporter, just to name a few. Clearly none of these roles can be performed well if the project manager doesn't understand the project's subject matter. Imagine a project manager from the CPI transported into a software company and asked to manage the creation of a new anti-virus program. He simply would not be able to do a good job because he wouldn't have enough subject matter knowledge. Instead of leading, planning, delegating, coaching, expediting, problem solving, and progress reporting, he would be duped, overcharged, delayed, and impeded.

The third important fact is that capital project management is primarily about construction, not chemical engineering. But we chemical engineers have had no training in the construction trades, the construction process, or even in the process control hardware used today. Unless we make an effort to fill in these gaps, we will be supervising work that we don't understand and cannot critique, and we will be dealing with people in a rather complicated realm, the construction process, that we don't understand either. And worst of all, this lack of understanding leads to increased costs, expanded schedules, and a compromise in quality. We don't need to become architects, or control engineers, but we do need to have a good, general understanding of the various trades, the construction process, and the control options available.

This talk will select areas of project management and the construction process where easily corrected mistakes are commonly made and offer suggestions that can be applied immediately to avoid these mistakes in the future.

Speaker

Glen Rosentrater
CP Project Services, inc.
(tel) 708-425-2279
(fax) 708-425-8615
cpprojserv@aol.com

Glen Rosentrater is president of CP Project Services, inc., a firm specializing in project management related seminars, and consulting. He has spent his career managing capital projects in the chemical process and food industries and has authored several papers dealing with project management, the latest being, "The Price is Right or Is It", in December's issue of CEP. He obtained his BS and MS in chemical engineering from the Univ. of Illinois at Chicago, and is a Project Management Professional (PMP). He is a member of AICHE and the Project Management Institute (PMI). He will be presenting three, one-day seminars, "Capital Project Management", "Foundations, Concrete, Welding, and Piping for the Chemical Engineer Project Manager", and "Electrical Power and Process Control for the Chemical Engineer Project Manager" at the Holiday-Inn Express in Joliet in August.

Chair's Corner

Dennis O'Brien
Chair 2003-04
Chicago Section AIChE

This month's meeting is on Project Management. Local member George Rosentrater wrote the paper on management in the December CEP. In addition to the presentation this month, George will provide a training session prior to dinner. This will qualify for additional training credit for PEs.

Elections

Elections are coming. This meeting will be the time to elect new officers. Although we have a full slate of officers in Chicago, many of the local section committees do not have the number of volunteers to fill all of the elected positions. If you are interested in becoming active in the section (one of the ways to qualify for Fellow), please contact Rebecca Patrick.

Last month the April meeting was at UIC. In addition to the Student poster contest and McCormack awards, there was a panel discussion on careers.

March meeting on Nano-technology

Professor Mansoori provided a fine introduction and overview of Nanotechnology applications. The meeting was well attended and plenty of great pizza was available. The slides have been posted on the web site. The presentation was followed by a good discussion on safety, manufacturing of nanoparticles, and applications. Additional information is in the November 2003 CEP. There is also an article in the April Scientific American.

We were honored by a visit From Hemant Dandekar, one of our past Chairs. Hemant is managing a plant in southern Wisconsin.

Help is needed....

in meeting planning: This entails checking with the site management for menu options, room arrangements etc. We use many of the same sites from year to year, so this is not too difficult.

in web content development: Ben Geres has been doing the web maintenance for several years. We hope to put more material on the site and less in print. To this end, we are proposing several content editors who will collect and prepare material for Ben to post to the web site. Alan Zagoria is doing the student section. I have been doing the jobs/resume section and the Chair's corner. We would like to add a section of Sustainable Development. J. Peter Clark has been providing interesting articles on food and other topics. Don Nell has been preparing the newsletter for the past few years and this move will greatly unload him.

in meeting reception: This entails coming to the meeting a little early and setting up the registration and payment area.

Next month

Process Development Conference meeting in Oakbrook. Annette has been the team leader on the organizing committee. Look online (both the local and national site) for more details!

The coming year

Many of the meetings have been sketched out. A seminar is tentatively set for October. Brian Gahan will be hosting a meeting on laser drilling at IGT. Rebecca Patrick will be assuming the role of Chair next month and will be keeping you informed by email and the Web.

Smart Systems

By Alan Zagoria, UOP, Alan.Zagoria@uop.com

Does AI Really Exist?

Most of us are paid to utilize our expertise to solve problems. This expertise might be writing computer models of chemical processes, troubleshooting problems in a production line, developing a new catalyst, minimizing emissions, selecting the right product for a customer's problem, or even teaching these skills to others. At the same time, we are surrounded by "smart systems" in our daily life which we usually take for granted; ovens that know how to cook a roast, search engines that try to figure out what we really mean, and really are looking for, even commercial jets where the pilot tells the computer where he wants to turn and the computer does the rest. Not to mention the Mars Rover pretty much taking care of itself, millions of miles away from NASA. Are these systems intelligent?

Before you answer, let me point out what must be the greatest irony of Artificial Intelligence (AI). Twenty five years ago, things like viewing a cat scan image and detecting abnormalities, detecting credit card fraud, or beating a human Chess Grandmaster at his own game would have been considered great successes in AI. But, once these feats are accomplished, the popular attitude becomes "oh, that was only a computer algorithm, it wasn't that hard to do, that's not really intelligent". Perhaps, by this definition, AI is doomed to never succeed. However, in fact, it is alive and well. You won't read about AI in the papers very often, but that is just because it is becoming commonplace and embedded in the things we use every day. It is a tool, not an end in itself.

Putting aside any philosophical differences between intelligent systems and smart systems, are smart systems useful tools for engineers? You bet!

Smart (Expert) System Fundamentals

I am going to talk here about expert systems, or more to the point, knowledge-based systems. I will just mention that there are many facets of AI I will not discuss in this article such as: pattern recognition, natural language understanding, neural networks, genetic algorithms, fuzzy logic, ... There are two types of expert systems, both of which are knowledge-based. They deal symbolically with knowledge - facts, relationships, and reasoning. Rule-based systems are composed primarily of rules (statements of fact and if/then rules). The second is case-based reasoning systems. These work with essentially a database of past experience, and a knowledge base of how to judge which past experiences most closely match the current situation, and how to adapt / adjust the solutions to the relevant experiences to the current problem.

The easiest way to think of a rule based system is to think of it as the embodiment of a fault tree; automating the troubleshooting chart you would have drawn by hand. In fact they are much more powerful because you don't need to explicitly lay out the tree with all its branches. You can simply specify the rules, in no particular order. There are tools around to make sure you are complete and consistent, if that is necessary. If you assign confidence levels to these rules, then you can generate a set of conclusions with overall confidence levels assigned to each one. The expert system has a built-in inference engine which will determine which rules to fire, and when. Only rules required to solve the current problem are fired. Only the data required to handle the problem is requested; this makes a big difference when obtaining lab samples or performing special tests is not easy.

Remember that object-oriented programming was invented by the AI community. What this means in a nutshell is that you can write the rules for one piece of equipment, or business unit, and have all similar equipment or Departments inherit the same rules with minor variations. Prototypes can be built quickly, and large scale problems are easily written and maintained.

Case-based systems are often employed in help desk-type situations where multiple people of various skill levels are addressing similar routine problems, and there is a large database of past experience. The know-how is in matching the current set of symptoms to previous experiences, and retrieving the closest matches (these catalyst types are similar to the current one, spill of diesel should be treated similarly to gas oil) and adjusting the previous conclusions to the current circumstances (the reactor is half the size of the known case, so only half the steam flow is required). It is often pointed out that this is typically the way doctors, and lawyers solve problems. In troubleshooting situations, engineers often use this approach, too.

Why Use Expert Systems?

Expert systems can capture limited expertise and make it available internally or externally on an unlimited basis 24 hours a day. They can be an invaluable aid to train new engineers to solve particular problems just as the expert. They can assure policies and procedures are executed consistently across the company. They can increase quality and productivity. They can improve performance and on-stream factor of plants.

Let me make it clear: expert systems /smart systems cannot replace human experts. They are advisors - able to help with the "routine" 80% of the problems that cross the expert's desk that take up a lot of the expert's valuable time, but are not really challenging to him/her (even though most people would have great difficulty solving them without an advisor).

Which Problems Are Good Candidates for Expert Systems?

You should be able to answer yes to each of these questions:

- Is the problem relatively narrow in scope?
- Does it have significant business impact?
- Is the knowledge required already written in Manuals or can an expert explain how to solve it?
- Is human expertise a limited resource, soon to be lost, or required 24/7?
- Does the problem require symbolic reasoning rather than primarily straight computation (spreadsheet)?
- Can the problem be solved without requiring common sense?
- When successful, will someone be willing to provide the resources required for its continued maintenance? This is a crucial issue for any software project.

Typical Expert System Applications

This list is intended only to spark your imagination: Customized websites (show the customer exactly what he is looking for)

- Troubleshooting / Diagnostics / Identification
- Monitoring (early detection of problems)
- Product Selection / Recommendation
- Compliance - (regulatory or internal policy)
- Smart Questionnaires
- Interactive Training
- Decision Support - Business Rules

How to Get Started

There are tools (shells) around that make developing a small expert system relatively easy and painless. From scratch you can put a small working system together in a matter of days. Some shells directly create web applications for easy deployment. Others create Active X Controls that can be embedded in other applications. There were lots of expert system shell and language vendors ten years ago. The numbers have dropped but you still have choices.

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It is most efficient, particularly for small demonstration projects, if the domain (technology) expert builds the expert system him/herself. If that person is not available or interested, certainly someone else can play the role of "knowledge engineer". Another great place to start, because the probability of technical success is almost 100%, is to capture in usable form the procedures in an Operating Manual, Policy Manual, or Emergency Guidelines Manual. In any case, use the screening list given above to test if you have a good pilot project.

More Information

I hope I have sparked your interest; I know I have not given a lot of detail. One way to get a hands-on feel for this technology is to run some simple online demos. Exsys (www.exsys.com) has a wide range of interesting demos. Several websites provide lots of resources, such as www.aaai.org/aitopics/aitopics.html and http://www.pcai.com/web/ai_info/expert_systems.html. *PCAI Magazine* (www.pcai.com) is a good user-oriented publication. There are lots of theoretical journals, *AI Journal*, the publication of the American Association of Artificial Intelligence is probably the most well known. Some vendors to know are Exsys Corvid (easy to build html-based systems), Visual Rule Studio (integrates with Visual Basic) and Gensysm G2 (for heavy-duty real time applications).

Registration is Open for PDS2004

Registration is now open for Process Development 2004. Look at the program and register online at http://aiche.org/conferences/processdev. This year's symposium, entitled Working Right on the Right Thing, will be held at the Oak Brook Hills Resort June 20-23. The conference begins with a reception on Sunday Evening. During the Symposium, presentations are scheduled in the Morning and Evening, allowing afternoons to be open for networking.

This is the second symposium offered by the Process Development Division. After this one, the schedule for Symposiums will be every two years on an even year, and it will be offered in the summer. Networking with other participants is as important as information offered in the seminars. In order to keep the symposium to "networking" size, the number of available "seats" is limited. Excursions to Chicago are planned in the afternoons. Seating is limited for those as well. A separate registration is available for spouses or family members who might attend with a participant.

There are five technical sessions: 1) Modeling, 2) Knowledge Management, 3) Pilot Plant, 4) Laboratory Tools, and 5) Working Right for the Future. In the fifth session, we will discuss trends and techniques for working right - Green Chemistry, Six Sigma and Knowledge Management. Participants will learn the latest thinking related to process development, and enjoy Chicago as well.

Local Section Members are working on making this meeting a success. We will still be looking for help with the soft briefcases each participant will receive. In addition to the program and a Process Development Division Tee Shirt, they will receive gifts from companies in the area. Volunteers will be needed to ask for and collect the gifts, and to fill the bags.

Plan to come, and spread the word!

Wasan Elected To National Academy Of Engineering
IIT VP, Motorola Chair Professor Joins Elite Group

Dr. Darsh T. Wasan, Motorola Chair professor and vice president for international affairs, has been elected to the National Academy of Engineering, considered the highest professional distinction for engineers in the U.S.

In naming Wasan, the Academy cited his pioneering research, inspirational teaching and the development of novel technology in colloidal processing and interfacial rheology. Academy membership honors those who have made important contributions to engineering theory and practice, including significant contributions to the literature of engineering theory and practice and those who have demonstrated accomplishment in the pioneering of new fields of engineering, making major advancements in traditional fields of engineering, or developing/implementing innovative approaches to engineering education.

Since coming to Illinois Institute of Technology in 1964, Dr. Wasan has received many national and international awards for his accomplishments in research and teaching, and he has been an outstanding leader within the IIT community. He has served as chairman of the department of chemical engineering, dean of engineering, vice president for research and provost and vice president for academic affairs.

2004 Harry McCormack Awards
Clint Butcher, UOP

Presentations for the Harry McCormack Awards were held last month during the Chicago local section AIChE monthly meeting. The ceremonies were held on the University of Illinois Chicago campus. The Chicago AIChE Section presents the Harry McCormack Award each year to one Senior from each of the colleges in the immediate Chicago area. The award recipients were nominated by the Chemical Engineering faculties of their respective colleges in consideration of their outstanding scholarship, extra-curricular activities, character and future contributions to society. This year's award winners can be found at the www-aiche-chicago.org website.

Job Postings

Job Seekers

S-0038 EXPERIENCED PROCESS ENGINEER
Over 15 years experience in plant processing. MBA. Six Sigma Green Belt Certification. Licensed Professional Engineer State of Illinois. Ten years unit operations and project engineering in resin manufacturing. Exceptional organizational skills in planning and executing detailed projects within strict time and budgetary constraints. Strong interpersonal and communication skills with ability to motivate others. For further information, contact: Stephen Orr @ (847) 844-3911

S-0039 PRODUCTION/PROCESS ENGINEER
High energy process and production problem solver. Experience includes batch and continuous process improvement and optimization. Fast learner. For further information, contact: Chicago Section Coordinator Jerry Bard at mattbenbard@charter.net

S-0040 EXPERIENCED PROCESS ENGINEER
with international experience. MBA, International Business. 18 years in process optimization, development and project management in Europe, the Americas and Asia. Strong leadership and team building skills. Six Sigma problem solving. Fluent in French with basic Portuguese and Spanish proficiency. For further information, contact: Stephen Wilkins at (847) 856-1571

The objectives of the AIChE are to advance chemical engineering in theory and practice, (mostly in practice...the theory stuff has too many fugacity calculations, ya know), to maintain a high professional standard among its members (wink, wink) and to serve society, particularly where chemical engineering can contribute to the public interest. This of course begs the question about how interested the public may be in chemical engineering. Trust me, it ain't much of a pick up line. But I digress. If you have any questions, comments or snide remarks regarding the newsletter, you could contact the editor at polarbear4x@yahoo.com, but he's a slug and won't return your e-mails, so I'd say don't waste your time.

Chicago Section Columns is published eight times a year by the Chicago Section AIChE. And that's way better than they do at the Rantoul Section. Opinions expressed herein are those of the officers and are not necessarily those of the authors of the Chicago Section. Wait a sec. Flip that around. Sorry. Articles for inclusion in the next Chicago Section Columns are just gonna have to wait a bit cuz this is the last one for the 2003/2004 year and I'm outta here! Last one out should turn the lights off.

Dated Mail

Chicago Columns
section

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Vice-Chair Program	Annette Johnston	Abbott Labs	847-935-5120	Annette.Johnston@abbott.com
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Job Posting	Gerald Bard	Matthew, Benjamin & Bard	262-279-6394	mattbenbard@charter.net
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Seminar Committee Chair				
Thiele Award	James Simnick	BP	630-420-5936	simnicjj@bp.com
Webmaster	Ben Geres	Middough Consultants	630-734-7055	geresbc@middough.com

Nominations for Officers 2005/2004 Year

The May meeting is the annual meeting of the Chicago Section and includes elections for the next year's Chicago Section Officers. The following nominations have been put forward, and the nominating committee consisting of Rebecca Patrick, Dennis O'Brien, and Alan Levine has found all nominees to be in good standing:

Succeeding to Chair: Rebecca Patrick

Becky Patrick has been an officer in both the South Texas and Southeast Texas AIChE sections. She has served as House Chair and Secretary of the Chicago section. She is currently Treasurer of the Chicago Section. Becky is a Regional Account Manager with Cognis Corporation in the Care Chemicals Division. She previously worked in Texas for Chevron Chemical Company and OxyChem in Production and Process Engineering Roles. She received her B.S. in Chemical Engineering from the University of New Mexico and an MBA from Texas A&M University at Corpus Christi. She is currently Chair-Elect.

Nominated for Chair-Elect: Annette Johnston

Annette Johnston has been active with AIChE since 1981, when she was an officer in the student chapter at the University of Illinois at Urbana. She was an officer in the St. Louis section. In the Chicago Section, she was Student Outreach Chairman, and Symposium Chairman. She has been a chemical engineer for 20 years, with experience ranging from process control, drawings and specifications and process development. She is a Licensed Professional Engineer in Illinois. She is currently the leader of the Process Remediation Team in the Specialty Products Division of Abbott Laboratories. Annette is currently the Vice Chair, Program, and is the Chairman of the Process Development Symposium to be held in Oak Brook this summer.

Nominated for Treasurer: Clint Butcher

Clint Butcher is a senior design engineer at UOP LLC where he is accountable for project execution of Schedule A design work involving light fuel technologies. He has been an active member within the Chicago local section of AIChE for the past three years. His work within the Chicago section has included serving as the Membership Chair. Prior to joining UOP LLC he worked for Halliburton Energy Services and for Black & Veatch LLC in both their Process and Power Divisions. He received his B.S. in Chemical Engineering from the University of Wyoming.

Nominated for Vice-Chair Programs: Brian Gahan

Brian C. Gahan is Manager, E&P Technology Development in the Exploration, Production and Gas Processing Center at Gas Technology Institute (GTI) in Des Plaines, Illinois. He is responsible for the planning and management of advanced technology research, and development and commercialization of products and processes. His responsibilities include market assessment, technology evaluation, and technology transfer and business development. He received a BS in Petroleum Engineering from Marietta College, an MBA from the University of Pittsburgh, and a Masters in Chemical Engineering from Illinois Institute of Technology. He is also an active member of the Society of Petroleum Engineers, American Association of Petroleum Geologists, and the Laser Institute of America. He served as treasurer of the Chicago AIChE section this past year.

ABSENTEE BALLOT REQUEST

I cannot attend the annual meeting in May 2004. Please send me an absentee ballot.

_____
Signature

_____
Name

_____
Address

_____

Return this form to:
Narayanan Sankaran
UOP
25 E Algonquin Road
Des Plaines IL 60016

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Nominated for Secretary: Narayanan Sankaran

Narayanan Sankaran is a Senior Safety & Risk Management consultant at UOP where he carries out this activity for UOP Technology and Process plants. He has been an active member of AIChE at the National and local levels since 1969. He has held official positions at the Chicago Section in the seventies, the Los Angeles section and the now defunct Joliet Section. During this period he has also had an active association with AIChE's Center for Chemical Process Safety. Sankaran has Bachelor's degrees in Chemistry, Chemical Engineering and a Master's degree from the Illinois Institute of Technology. 'Sank' has worked predominantly in the Petroleum and Chemical Industries with the Shell International Petroleum Co, UNOCAL Corp and UOP. He has been an active Member of API and the Society of Risk Analysis. Two years ago he was recognized for 50 years of in the Field of Chemical Engineering.

Nominated for Director-at-Large: Alan Levine

Alan Levine is the Director of Construction Services at Pioneer Engineering and Environmental Services, Inc. His is responsible for managing a group providing both pre-construction services and construction quality insurance testing. In addition to his role in providing construction services, he specializes in mold testing and remediation. He received his B.S. in Chemical Engineering at the University of Illinois in Champaign, Illinois. Alan is a registered professional engineer. He has been active in the Chicago Section for many years, holding numerous positions including treasurer and chair. He is currently chair of the Local Section's Project Connect subcommittee.

Nominated for Director-at-Large: Alan Zagoria

Alan Zagoria has been active in AIChE since his University days. He has served as Chair of our Student Outreach Committee since 1996. He was recently appointed to the CEOC Operating Council of National AIChE, and elected Fellow of the Institute a few years ago. Prior to joining the Chicago Section he played a major role in the Tappan Zee Section, which he helped found. Alan holds a B.S. and M.S. degrees in chemical engineering from Northwestern University and Manhattan College, respectively. Alan is a Senior Consultant with UOP in Des Plaines.