

# The Packed Column

American Institute of Chemical Engineers - Upper Midwest Section

November 2008

## EDITOR'S CORNER

by Brian E. Jensen

Chemical engineers need to grab hold of their own destinies. I became a ChemE expecting to devise new processes that would make millions \$\$\$. I thought everyone had the same ambition, but maybe not. The reality is that companies do not want new ideas yet complain that the old ideas don't sell. We had a symposium speaker 3 years ago who said the demand for actual chemical engineering is down and they are making the courses at UM less technical. Baloney. Half of the big problems people are concerned about are ultimately chemical engineering problems. Congress passes bills to spend hundreds of billions of dollars to solve these problems. The first to the trough are shysters with secret histories and no engineering backgrounds who can write grant proposals and pull the right strings. Engineers are treated as peons under the direction of these individuals.

A college student told me at a meeting that a chemical engineer would always be in charge and the mechanical

engineers would keep things mechanically strong. The reality is that any mechanical engineer or even draftsman can call himself a process engineer and with enough self-confidence, will be believed. What the unqualified people don't understand, they perceive as irrelevant nonsense.

Chemical engineers must unite, own their own patents, pool their talents, and take a leadership role. We allow those who cannot engineer become managers and we become their unappreciated technicians.

To serve chemical engineers, there is a new website that allows any member to post chemical engineering messages that are sent to all members, and in the file section to post a resume file, one personal information file where the member can say anything decent (editor rules), post decent photos of interest, and post any job openings.

<http://tech.groups.yahoo.com/group/ChemEngrForum/>

Why do other people become chemical engineers? Are they just looking for a safe high paying job? Do they dream big?



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# NOVEMBER MEETING

## Tour of Xcel High Bridge Plant

**When:** Thursday, November 20th at 3:30 PM

**RSPV:** [doc\\_curtis@rocketmail.com](mailto:doc_curtis@rocketmail.com) by November 14<sup>th</sup> with **Name & Company**. The tour is limited to the first 30 people.

**Where:** Xcel Energy High Bridge Plant  
155 Randolph Avenue  
St. Paul, MN 55102

**Tour:** High Bridge is a combined cycle generating facility with a total generating capacity of 570 megawatts. A combined cycle plant produces electricity from two sources of energy: 1) Natural gas is used as a fuel in a combination turbine, similar to a jet engine; 2) Exhaust from the combustion turbine also is used to make steam in a heat recovery steam generator. Both sources of energy drive turbines and electric generators to produce electricity. Integrating combustion turbine and steam turbine technology provides an extremely efficient production process.

Built in 1923 as a coal-powered operation, the High Bridge plant, along with Riverside in Minneapolis, once formed the hub of Northern States Power Company, a predecessor to Xcel Energy. The original plant was replaced with a new natural gas fired generating facility starting in 2005 as part of Xcel Energy's Metro Emission Reduction Project. The coal-fired plant was retired in 2007 and the new facility came on line in May 2008.

The conversion of High Bridge from coal to natural gas significantly reduced all air emissions from the plant-particulates by about 92%, nitrogen oxide by almost 97%, sulfur dioxide by 99% and 100% of mercury emissions.



### Directions to High Bridge Plant:

The plant is a little further east along Randolph than is shown by the X. Turn on to Randolph, south of the plant, from Shepard Road. Enter the plant gate, and go to the left. If parking lot is full, park on the shoulder of the ring road. We will meet in the training room on the second floor. The tour should take about an hour. If members have their own hard hats and safety glasses, they should bring them along. If not, we will provide safety equipment.

## DECEMBER MEETING

### What Makes Tape Sticky? The Science and Engineering of Pressure Sensitive Adhesive Products

**Dr. David Yarusso, 3M Commercial Graphics  
Division**

**Tuesday, December 9th, 2008  
5:30 p.m. – 7:30 p.m.**

**Meeting Location:  
The Old Spaghetti Factory  
233 Park Avenue  
Minneapolis, MN 55415**

#### **Abstract:**

Pressure sensitive adhesives are found in a wide variety of products in common household and industrial use. These materials can range from the low adhesive force of a Post-It® Note to the permanent bonding ability of the VHB™ Tapes. Unlike other adhesive types, pressure sensitive adhesives undergo no change of physical state after bond formation. In this talk we will explore what is understood about the requirements of the physical properties of such adhesives and how one adjusts to design for specific product requirements. We will look at an overview of the literature in this area discussing the effects of adhesive rheology on tack, peel, shear, and removability performance. We will also describe the use of microstructure in the adhesive surface to enhance performance for certain applications such as large format graphic films.

#### **Speaker Biography:**

David Yarusso received his Bachelor's degree in Chemical Engineering from the University of Minnesota in 1978 and then proceeded to earn a PhD in Chemical Engineering from the University of Wisconsin in Madison in 1983. His thesis research focused on structure-property relationships in polymers, specifically ionomers. He started at 3M in 1983 and has worked there in various aspects of pressure sensitive adhesive technology ever since. He has had experience with development of adhesives for masking tape, box sealing tape, and diaper tape and has most recently been involved with development of adhesives for large format graphic marking films such as those used to apply graphics to trucks, vans, trains, and cars.

#### **Reservations**

Reserve a spot by sending an e-mail to [doc\\_curtis@rocketmail.com](mailto:doc_curtis@rocketmail.com) by **December 5** (include [name, company/affiliation, and choice of meat or](#)

[marinara spaghetti](#)). The sooner we get your RSVP, the easier it will make planning. Thank you.

#### **Cost**

\$12 for members, \$24 for non-members

#### **Agenda**

5:30 p.m. – 6:00 p.m. Social

6:00 p.m. – 6:45 p.m. Dinner

6:45 p.m. – 7:30 p.m. Presentation

#### **Link to**

**Directions**<http://www.mapquest.com/maps/map.adp?address=233%20Park%20Ave&city=Minneapolis&state=MN&zipcode=55415%2d1112&country=US&title=233%20Park%20Ave%20Minneapolis%2c%20MN%2055415%2d1112%2c%20US&cid=lfmaplink2>

## AICHE University of Minnesota Student Chapter

So far, we have had several companies come to visit and talk with students about professional opportunities and also our group put on a beginning of the year banquet for students in the department. Last spring, our car team placed 3rd in the regional competition in Akron, OH. On the weekend of November 15th-16th our chemical car team will be competing in the national competition at the AICHE centennial celebration in Philadelphia, PA. This year's car, the gopher 5.5, will be run off of a biological reaction. Our group hopes to continue holding regular events throughout the year like bowling, snowboarding and more professional development events. Any other questions just let me know!

AICHE Student Secretary at the University of Minnesota  
Nikki Sullivan  
[sulli404@umn.edu](mailto:sulli404@umn.edu)

### YPAB ANNOUNCEMENT

by Steven Head

The Young Professionals Advisory Board (YPAB) is dedicated to gaining and maintaining the participation of young professional members. YPAB will foster relationships with young members and employers to promote increased participation. They will also advise AICHE on how to reach this target group and offer products and services that meet their needs. Activities of the YPAB include seeking and inviting potentials, planning social events and local industrial tours, and arranging technical presentations by local organizations.

If you are interested in an exciting opportunity to network, help young professionals, and promote AICHE, please contact Steve Head [shhead@sebesta.com](mailto:shhead@sebesta.com) to join YPAB. Young professionals are welcome.

**Place an ad here and get results! Reach over 700 chemical engineers!**

**Nathan Johnson, [doc\\_curtis@rocketmail.com](mailto:doc_curtis@rocketmail.com)  
651-737-0144**

## Energy Engineer Job Description

The Minnesota Technical Assistance Program (MnTAP) at the University of Minnesota seeks an engineer with 2 years or more of experience with industrial energy conservation and /or manufacturing processes.

This position involves working on steam systems to identify conservation opportunities, determine barriers to implementation of those opportunities, and find ways to overcome barriers and justify cost-effective changes that improve the energy efficiency of steam operations.

This position will also conduct overview studies of specific industrial processes to identify how energy is consumed, the relative magnitudes of various modes of energy use, and the types of conservation techniques and technologies that are appropriate for various manufacturing operations.

This position will also conduct pollution prevention and waste reduction outreach and assistance to Minnesota industry to identify ways to improve process efficiency and reduce process waste hazards or energy use, with the goal of improving Minnesota's environment.

Some of the benefits of the position include:

- Working to improve the environmental performance of Minnesota
- Work variety: people, manufacturing processes, and problems to solve
- Flexible work schedules
- Educational opportunities through [Regents Scholarship](#)
- Excellent [vacation](#) and [health care](#) benefits

### Job Duties

This position involves analyzing industrial processes and identifying ways to improve efficiency or reduce process waste hazards or energy use with the goal of improving Minnesota's environment.

This position will also supervise engineering student interns placed at manufacturing facilities and will support MnTAP program activities through planning, outreach, program management, and evaluation.

Over the longer term, there will also be opportunities to identify business needs related to environmental improvement, and then formulate projects to implement solutions in other industry and process areas.

- **Desired Qualifications**  
B.S. in mechanical, chemical, industrial, or civil engineering, with related energy and manufacturing experience.
- Knowledge of steam boiler and distribution system operation is useful.
- Knowledge of manufacturing operations is important, particularly related to process efficiency and waste reduction.
- Knowledge of bio-based fuels is a plus.

This individual will work with companies on a voluntary, outreach basis and needs to be able to work smoothly with people of various backgrounds, duties, and authority – including small business owners, production management, line operators, and facilities and maintenance staff.

Excellent communication skills are a must. Applicants must be able to formulate persuasive arguments for change based on process analysis.

This person will be in charge of their own projects and must have the ability to plan their work and follow through. There will be a need to develop industrial, trade association, and governmental contacts to promote and implement pollution prevention and energy conservation.

This person will do some traveling throughout Minnesota and needs a valid driver's license.

For application requirements and procedures, visit the University of Minnesota's employment web site <https://employment.umn.edu/applicants/jsp/shared/frameset/Frameset.jsp?time=1224710265046> and search for requisition #158888.

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