UNIVERSITY OF IOWA
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

Chemical Engineering Newsletter

AICHE SPRING 2010

INSIDE THIS ISSUE:

Advisor's Corner

Professor David W. Murhammer

Greetings to Hawkeye Chemical Engineers!! This Spring 2010 issue of our AIChE Student Chapter Newsletter begins with an article about the University of Iowa's participation in the AIChE Mid-America Regional Conference held in Ames, Iowa. Congratulations to Laura Northrup, a junior in our program, who received 3rd place in the paper competition at this meeting. The 2nd article in this newsletter discusses the 2010 commencement ceremony. Only 15 chemical engineering students received their BSE degrees at this ceremony, but three of these students were acknowledged for special achievements. Jamie Cecil and Tianjiao Wang both graduated with highest distinction (given to University of Iowa graduating seniors whose GPA is among the top 1% campus-wide) and Amy Althoff was selected by her peers as the outstanding graduating senior. This newsletter also contains two sets of "topical papers" that were written as requirements for the Chemical Process Safety course that I taught during the Spring 2010 semester. Two students' papers are included that discuss their opinions regarding the future of chemical regulations in the United States. Another three students' papers are included that discuss their opinions regarding the best approach to protecting chemical plants in the United States from terrorists. The primary reason for requiring these topical papers in this course is to introduce students to contemporary issues that are relevant to chemical process safety. This newsletter concludes with three maps indicating the summer activities of many of our students in Iowa, the United States, and worldwide, respectively.

Finally, I encourage our alumni to donate to the endowment fund that will be used to support our student chapter activities. If you are interested in contributing to this fund, then please contact me via email at murham@engineering.uiowa.edu to discuss specific details.

Left:
Chemical and Biochemical Engineering students at the closing banquet of the 2010 AIChE Conference in Ames, IA

2010 AIChE Regional Conference

Written by Amber Johnson

On April 9, 2010 thirty students made their way to Iowa State University for the AIChE Regional Conference. The weekend was full of fun events and socialization with students from schools around the region.

The conference began with the Chem-E-Car poster competition Friday evening with the actual competition Saturday morning. Although Iowa did not have a car this year, the students enjoyed learning about the entries from other schools and seeing the fierceness of competition that will be present next year!

Because the Chem-E-Car competition ran so smoothly Saturday morning, many students took advantage of the sunshine and explored the campus or played a fun game of basketball. At noon, lunch was served and several company representatives were present to mingle with the students.

After lunch, presentations on research and other keynote sessions began. Two University of Iowa students, Laura Northrup and Annie Kock, gave very professional presentations on their research in pharmaceuticals. At the awards banquet, Laura was awarded third place.

The keynote speaker at the awards banquet, Dr. Alex King of the U.S. Department of Energy's Ames Laboratory, gave an interesting speech about some of the work he has done. In addition, it was fascinating to hear about his collection of guitars made from non-traditional materials. The conference ended and everyone was happy to have attended both the social and scholarly events of the weekend.

Right:
Laura Northrup proudly shows off her third-place certificate awarded for her presentation on pharmaceutical research

Left:
A group of the students that attended the 2010 AIChE conference on the Iowa State campus in Ames, IA

2010 Commencement Ceremony

Written by Alyssa Azzano

On Saturday May 15, 2010 at the University of Iowa Memorial Union, UI President Sally Mason awarded 185 degrees to engineering students. Fifteen of the these students graduated from the Department of Chemical and Biochemical Engineering with their BSE degrees. Two students from the department, Jamie Cecil and Tianjiao Wang, graduated with highest distinction.

Ben Peiffer, who graduated with a BSE in Electrical Engineering, gave the graduating senior address. Gregs Thomopulos, Chairman of the Board and CEO of Stanley Consultants, Muscatine, IA, gave the charge to the graduates.

Scott Ruebush, Engineering Student Council Co-Chair, awarded the graduating senior award to Amy Althoff, a graduate of the Chemical and Biochemical Engineering Department. Amy was chosen for this award by the entire graduating senior class of 2010.

The graduating class made a significant impact on the Chemical Engineering Department here at the University of Iowa. They served as excellent mentors and role models for underclassmen in the department. We wish them the best of luck in their bright futures.

The engineering commencement ceremony can be viewed online at: http://www.youtube.com/universityofiowa#p/c/5/7l0NOZjUyWM

A Right to Know:

Chemical Regulations for New Toxic Substances

Written by Jaro Lepic

In the forty years since Congress passed the Environmental Policy Act and the Occupational Health and Safety Act, public awareness of the potential threat that many chemicals pose to public health and the environment has increased significantly. Although the toxicological effects of most chemicals are not general knowledge, the common perception is that most chemicals are dangerous or deadly if released into the environment. This commonly held belief is not without justification; all chemicals in high concentrations can have serious consequences to both health and safety. For this reason the Toxic Substances Control Act (TSCA) was passed by Congress in 1976. The TSCA is a supplement to the Environmental Policy Act, which broadens and defines the Environmental Protection Agency's (EPA) authority over importers, exporters and manufacturers of all chemicals. This article hopes to explore and address the effectiveness of the EPA in monitoring and controlling toxic substances; it will also offer suggestions for the improvement of governmental regulation in the United States regarding the chemical industry.

Under the TSCA the EPA is responsible for monitoring 83,000 chemicals, with approximately 700 new chemicals submitted for review each year (Layton, 2010). Each new chemical requires that a 90-day pre-manufacture notice be submitted to the EPA under Section 5 of the TSCA. During this period the EPA reviews any potentially harmful effects the chemical may have on public health or the environment. The manufacturer provides all of the information for these reviews; this includes data on toxicity testing (EPA, 2010). Although the toxicity testing procedures for new chemicals are established by the EPA, only moderate supplemental toxicity testing is performed by the EPA, and only for chemicals that are considered to be exceptionally hazardous. Most of this toxicity information is publically available on the EPA website; however, manufactures may submit under Section 14 of the TSCA to keep information about their products confidential, including information regarding toxicity (EPA, 2010). Because of this confidentiality no independent toxicity testing can be performed on some of these new chemicals.

Independent research on the properties of new chemicals conducted by non-governmental organizations (NGOs) or academic institutions is a cornerstone to public safety. Most citizens are unaware of how toxic substances specifically affect them or the environment. For this reason most people look to either government agencies or NGOs to interpret this information for them. Because manufacturers collect the majority of information provided by governmental agencies regarding these chemicals, some public mistrust of this information exists. Most people generally trust the EPA to act in the public's best interest when evaluating toxic substances. However, many people look to NGOs to reassure them that in fact the regulations are sufficient, and if not to inform the public more quickly and more accurately than governmental agencies. Because NGOs hold such powerful sway over public opinion, their exclusion from the chemical testing process is unacceptable.

Public welfare far outweighs the need for confidentiality regarding chemical substances. Medical professionals and emergency response services need to be fully informed about the toxic effects of all potentially dangerous chemicals. This allows them to develop medical treatments and emergency response plans for an exposure to toxic chemicals before they are encountered. Because memorizing the toxic effects and treatments to 83,000 chemicals plus approximately 2 new chemicals per day is impossible, the toxicity information regarding all chemicals needs to be made easily accessible by the EPA in order to prepare for an incident of chemical exposure.

The concern put forth by chemical manufacturers that the disclosure of toxicology information would allow competitors to recreate their technology or chemical product is justified. However, the protection of intellectual technology is a patenting matter and corporations have ways of protecting their intellectual property rights without endangering public health and safety. It is important to note that the argument being presented here is for the full disclosure to the public of toxicology information and basic Material Safety Data Sheet (MSDS) information, not the reagents used to form the new chemical or the processes used to produce it. Reverse engineering a product from basic MSDS and toxicology information would be extremely costly and time consuming for competitors.

New chemical regulations should require the posting of all chemical MSDS and toxicology information on the EPA's website for new chemicals as they pass their 90-day review. These chemicals should be put onto a separate list for a short time period so that either individual citizens or NGOs can review the potential hazards for new chemicals being produced or imported into the United States. The EPA's current policy of confidentiality on the behalf of chemical producers can only serve to increase the public mistrust of the chemical industry and their policing agency. In order to protect public health the information necessary for individuals to protect themselves and their communities from hazardous substances is a right that all citizens must have.

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Chemical Regulations in the United States

Written by Mike Lee

Over the next quarter century, global chemical production is projected to double, rapidly outpacing the rate of population growth (Schwarzman & Wilson, 2009). Consequently, chemical regulation is expected to be one of the major topics of discussion among politicians in the upcoming year. The 1976 Toxic Substance Control Act (TSCA) is the United State's current federal statute governing the manufacturing of chemicals (Congressional Outlook, 2010). However, this policy requires some significant revamping in order to increase its effectiveness. The European Union's new legislation, the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH), may be a key source for generating ideas for the improvement of U.S. policies.

The main problem with the TSCA is that it does not require companies to provide basic information regarding chemical uses, health effects, or exposures. In order for this data to exist, the government must generate it for each chemical produced. Since this is a very challenging task, it is often not accomplished. As a result, the TSCA has failed to provide government organizations with sufficient means to control most chemicals. In fact, since its inception, the TSCA has allowed the Environmental Protection Agency (EPA) to enforce regulations upon only five substances. Consequently, some U.S. states are developing their own approaches to chemical regulation (Schwarzman & Wilson, 2009). This reduces the uniformity of chemical policies from state to state, which is an additional complication for the chemical industry. National regulations would be easier for authorities to enforce and for industries to follow.

The EU's REACH program has several primary strengths that can address the above weakness, and many others, of the TSCA. The REACH program's first, and perhaps most significant, advantage was placing the burden of proof on the producers, not the government. This divides the costs and animal requirements among each company instead of placing this burden on the government, which is infeasible. Also, REACH does not exempt chemicals produced prior to its introduction like the TSCA. This is very important since some chemicals produced before the 1976 TSCA may not meet current safety regulations. REACH also requires companies to report each chemical's hazard information, usage, and two way flow. The TSCA has very lenient or no requirements at all for each of these categories (Schwarzman & Wilson, 2009). This prevents government from knowing what constitutes safe usage of chemicals or from monitoring waste streams. Each of the above strengths would be very beneficial to include in U.S. chemical policy reform.

Conversely, the TSCA program does have some advantages that the United States should take into consideration while revising the current policy. The TSCA allows companies to make trade secret claims. This is very important for business to remain profitable. However, what is allowed to be kept secret must be regulated to keep claims at minimal levels. This is necessary because there is the concern that trade secrets are being used to hide the dangers of chemicals from the public, in addition to ensuring the financial security of the organization. Dangerous chemicals should not be used unless there is no substitute available or the socioeconomic benefits outweigh the health and environmental risks (Schwarzman & Wilson, 2009). The U.S. needs to consider allowing more claims than the REACH program in order to promote economic growth. However, the new policy must not set a precedent similar to the current one, where nearly all products are classified as a trade secret. A successful policy will provide significant protection to the public, like the EU REACH program, but allow companies to keep information that is essential to financial success secret, like the TSCA. Balancing these two options is essential to the success of chemical policy reform in the United States.

Another major setback from the implementation of the EU's REACH is its costs and animal requirements. This program will cost the industry $13.6 billion, six times the expected value, and 54 million animals, a substantial amount more than originally estimated. Additionally, Europe does not have enough laboratories to perform all the necessary experiments (Gilbert, 2009). These numbers need to be severely reduced in order for this program to be more feasible to implement. As reported, the study of the effects of chemicals on reproductive functions accounts for 90% of the animals required and 70% of the projected cost (Gilbert, 2009). Serious consideration should be taken before implementing similar policies in the United States. Each component of the proposed policy should be analyzed to determine if the additional cost is justified by the resultant increase in effectiveness of the safety program.

In summary, the United States should generate a chemical safety policy that is expansive enough that it can be accepted uniformly across all states. Additionally, it needs to place the burden of generating safety data for each chemical on the manufacturing company. As a result, the necessary data can be obtained to allow for adequate enforcement of this new policy. Lastly, this policy needs to have requirements that result in minimal costs and animal usage. Otherwise, it will no longer be profitable for the manufacturer to continue to produce chemicals. Through the successful implementation of an effective chemical safety policy, approximately $60 billion could be saved due to prevention of occupational diseases alone (Schwarzman & Wilson, 2009). Therefore, a program that increases the health of the public, reduces detrimental impacts on the environment, and will eventually pay for itself, would likely be accepted by the public, government, and industries alike.

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Chemical Plant Concerns in National Security

Written by Allison Robinson

In the wake of the September 11 terrorist attacks national security has been at the forefront of public policy. Increased security precautions have not been limited to the airline industry; the safety and potential vulnerability of a wide array of other businesses, including chemical plants, has also come under review. Facilities that make, use, or store chemicals are considered one of the country's most significant vulnerabilities in the event of a terrorist attack. It was estimated by the Government Accountability Office that if one of the 123 most vulnerable plants were attacked more than 1 million people would be seriously injured or killed (Hess, 2010). This has fueled a debate over the best way to incorporate chemical plant concerns into national security legislation.

The current legislation, known as the Chemical Facility Anti-Terrorism Standards (CFATS), was developed in 2007 and is set to expire in October 2010 (Hess, 2010). CFATS is used by the Department of Homeland Security (DHS) to regulate security issues at facilities considered high risk. Facilities that handle chemicals that have been deemed a threat are ranked based on security assessments; of the 38,000 facilities screened 7,000 were determined to be a great enough risk to be subject to CFATS requirements (Hess, 2010). This consists of developing security plans for areas the DHS has flagged. Under the legislation the plants have a great deal of flexibility in determining how to enhance security and safety precautions. Because of this flexibility, chemical manufacturers support the senate's proposed bill to extend CFATS until 2015. However, a bill passed by the House of Representatives would also give the DHS the authority to enforce the implementation of inherently safer design.

Inherently safer design is a strategy to avoid hazards in the first place, rather than resort to adding additional safety measures. Inherently safe systems remain in a nonhazardous state even if the system deviates from normal operating conditions (Bollinger et al., 1996). Because there will always be some degree of risk no plant can be entirely safe, hence the term "inherently safer." The four methods of implementing inherently safer design are minimization, substitution, moderation, and simplification (Kletz, 2009). Minimization is reducing the amount of harmful chemicals used in the first place; the theory is that if there is not enough hazardous material on site to cause an issue even in the event of a leak, the plant will be much safer. Substitution involves replacing harmful chemicals with less hazardous ones. Moderation means using less harmful conditions, such as storing chemicals far from their flash points (the temperature at which a material can be briefly ignited) or using chemicals in their least hazardous form. Finally, simplification involves designing the plant so that it is not over complicated, which reduces the likelihood of operating errors (Bollinger et al., 1996).

Currently there is debate over the justification of incorporating inherently safer design into national security legislation for chemical plants. The House bill would include this measure, while CFATS does not. The main argument for the extension of CFATS is that the House bill shifts the attention from anti-terrorism protection to performing engineering assessments, which could potentially phase out products that are considered too unsafe (Hess, 2010). Opponents of the House bill claim that the necessary measures to make a plant inherently safer would cost a large amount of money, which in the current economic climate could be fatal for smaller companies (Hess, 2010). However, neither of these claims is true. Inherently safer design does not shift attention from security; rather, it is a more foolproof method of ensuring safety. By minimizing the amount of hazardous chemicals on the premises and replacing harmful chemicals with safer ones when applicable the facility will naturally become less of a security threat (Hendershot, 2006). Also, inherently safer design does not translate to spending more money. In fact, inherently safer plants are often cheaper as they do not require additional protective equipment to be added (Kletz, 2009).

Both the house bill and CFATS would require high risk facilities to construct a security plan; the house bill would simply require these facilities to consider using safer technology alternatives as part of this plan. The DHS would only have the authority to require implementation of inherently safer designs for the highest risk facilities, which constitute less than 3% of the facilities covered by CFATS, and all of which would have the right to appeal the decision (Hess, 2010). Additionally, this would only be applicable for situations where the method is feasible and cost-effective, disproving the theory that the bill would cause plants to lose revenue from being told certain chemicals could no longer be produced (Hess, 2010). The bill is written so that no changes can be implemented which will threaten jobs at any given facility. Furthermore, any implementations that are required would not be expected to be completed instantly; the DHS would work closely with the individual plants to integrate these changes over time.

The existing CFATS legislation mandates that a security plan be created and implemented at vulnerable facilities to enhance national security; the house bill simply takes security a step further by introducing the idea of inherently safer design as an additional security measure. Designing chemical plants to be inherently safer is the only certain way to protect citizens from a catastrophic event at one of these locations. Altering the way a facility functions is a valid method for increasing security and should be adopted into US legislation.

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Inherently Safer Design Can Increase Security of America's Chemical Industry

Written by Amber Johnson

Security of the United States of America has become increasingly important in light of the terrorist attacks on September 11, 2001. Thus, the Chemical Facility Anti-Terrorism Standards (CFATS) were introduced in 2007 to increase security in and around chemical facilities (Hess, 2010). These standards allowed the Department of Homeland Security (DHS) to identify and secure chemical plants which pose the greatest risk in terms of the consequence of a successful attack, the likelihood that an attack would be successful, and the intent and capability of attacking a facility (Homeland Security, 2009). While the CFATS increase safety with respect to threat of attack, many changes within plants could be made to reduce the need to protect them. Reducing the consequence and vulnerability of chemical facilities through Inherently Safer Design could cut the need for higher security. Inherently Safer Design should therefore be required in order to further protect American citizens.

Inherently Safer Design (ISD) permanently eliminates or decreases hazards via four main pathways: minimization, elimination, substitution, and simplification (Murhammer, 2010). ISD is an ideology which considers the whole chemical process in reducing hazards so that protective equipment is not necessary. Of the 7,000 chemical plants identified as high risk in the CFATS implementation, about 1,000 were not regulated due to voluntary material and process modifications (Hess, 2010). Had ISD been a part of the original legislation, perhaps a higher fraction could have reduced their risk without implementing higher security standards.

Additional benefits of Inherently Safer Design include reducing environmental and health concerns for certain processes. By using a chemical with a lower toxicity, a release of that material would have less impact on the ecosystem surrounding the facility and increase the safety of the workers and nearby residents. Reducing the temperature and pressure of a process decreases the chance of explosion, thereby curtailing the area which residents could be affected by a blast. The central purpose of increasing security by reducing danger thus positively influences the welfare of the workers and the community.

As with any program, the downfalls should also be considered. One of the major deficiencies of ISD is that all technologies are relative to one another. There is no scale to measure whether or not a process is safe without comparing it to a different process. One process may be inherently safer than another but still not meet the safety expectations of society.

Another risk of ISD is that in changing one process to be safer, the next step in the process can become considerably more dangerous. Thus, the entire life cycle of a chemical process must be considered to avoid transfer of risk from one stage to another. Finally, the economic feasibility of such a program has been questioned. Some believe that the billions spent on protecting the chemical industry from terrorist attack is enough, and that more spending to further reduce risk would be unnecessary (Hess, 2010). As with any safety program, protecting lives is much more valuable than the associated financial burden. Inherently Safer Design would save lives and increase the security of chemical facilities regardless of the cost when applied properly.

Support for Inherently Safer Design as a conditional requirement to the CFATS reauthorization bill would help convert many facilities into safer places to work. Implementation of ISD into CFATS would be optimal, as enforcement through site visits has already been employed (Hess, 2010). The early assessments of CFATS coupled with ISD could help reduce spending on security measures, thus reducing the associated costs. Like CFATS, only facilities with high risk would be required to participate, but involvement without requirement should be encouraged. With the potential for more chemical regulation, Inherently Safer Design could also protect companies from harsher restrictions by reducing hazardous chemical use.

Although Inherently Safer Design is not intended to directly reduce risk of terrorist threat to the chemical industry, its use can reduce the need for protection from such a danger. Reducing the hazards within a chemical processing facility has been shown to minimize the need for security implementation. The program is win-win because it protects Americans via two methods: eliminating risk of terrorist attack and decreasing the hazard of working or living near a chemical processing facility. Because most companies do not currently practice Inherently Safer Design, it should be implemented into legislation.

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Inherently Safer Design: Improving Safety and Security

Written by Laura Northrup

After September 11, 2001 security became a prime concern for the United States. It was determined that chemical facilities are one of the nation's greatest vulnerabilities during a terrorist attack. The Government Accountability Office has estimated that an attack at any of the 123 most vulnerable chemical plants in America could lead to serious injury or death of more than one million people. In order to better protect U.S. chemical plants the Department of Homeland Security (DHS) created the Chemical Facility Anti-Terrorism Standards (CFATS) in 2007. Although this program has shown great success in the improvement of chemical plant security, there is presently debate about possible changes to these standards (Hess, 2010). The largest dispute is centered on a form of safety measurements and precautions known as inherently safer design (ISD). ISD relies on inherent and passive risk management strategies to minimize accidents in industry (Bollinger et al., 1996). Current debate stems from the idea that ISD does not directly relate to security and therefore should not be included in legislation to protect chemical facilities (Hess, 2010). However, the benefits ISD implementation would provide highly out-weigh any political concerns. Although it is present in the political spotlight, the issue of ISD is much more an issue of human rights and science than pure politics.

Just as it is impossible to fully protect a chemical plant from attack, it is also impossible to have an inherently safe plant, as risk will always be present. ISD therefore is a strategy to achieve as much safety as possible by analyzing chemical plant hazards. For design strategies are applied to the implementation of ISD. The approach to ISD is to minimize, substitute, moderate, and simplify the conditions in current chemical plants. Through these strategies a number of changes may be made to a facility to improve safety and decrease hazards. Examples of ISD strategies include using smaller quantities of hazardous materials, replacing current materials with less hazardous substances, using less hazardous conditions to minimize the impact of an accident, and designing facilities to eliminate unnecessary complexity to reduce possible operator error (Crowl & Louvar, 2002). Under House legislation that was recently passed the DHS would be given the authority to mandate the use of ISD in high-risk chemical facilities. Current laws give chemical companies the flexibility to make decision on protective measures, such as the implementation of ISD, as long as the measures meet CFATS requirements. The greatest difference between the current and new legislation is the requirement of ISD implementation if the DHS deems the measures both feasible and cost-effective.

Although it is generally agreed that security and safety of chemical plants is important in the protection of citizens, the role the government should play in these matters is highly disputed. Industrial officials have expressed concern over government mandated ISD implementation as these procedures may be pricey and cause adverse economic conditions. Another concern expressed is that of increased prevalence of outsourcing for chemical companies if the laws in the United States are too stringent (Hess, 2010). While these concerns are valid, the protection of a human life should be the number one priority, no matter the economic consequences. Additionally, the movement of hazardous chemical plants overseas only perpetuates violations of human rights, as foreign workers should be guaranteed the same level of safety in their work environment as domestic workers. Also, although anti-terrorism measures are directly stated as a part of ISD, the use of less hazardous materials will decrease the severity of a terrorist attack if one were to occur on a chemical plant. Upon examination of current concerns, it is evident that the requirement of ISD for high-risk chemical plant would help society even more than the proposed harm the legislation could cause.

In addition to saving lives through the reduction of deadly accidents, ISD often works to protect the environment (Hess, 2010). Methodology behind ISD and green engineering is very similar, as both seek to decrease or eliminate risk factors instead of only controlling the hazard. ISD strategies aid not only in reducing hazards, but also reducing the amount of material that is needed and possibly leading to substitution of hazardous components for those which are more eco-friendly. Decreasing the hazardous materials used in a plant also decreases the likelihood of dangerous toxic releases. These releases are both dangerous to humans and wildlife, and ISD may be used to diminish the possibility of release producing accidents (Toups, 2003).

Although debate still rages regarding the adopted of an ISD mandate the importance of ISD to save lives and protect the environment is clear. ISD promotes the use of less hazardous materials and processes in chemical plants, leading to a reduced risk of accidents.

Also, contrary to current arguments, the use of ISD will lead to better security and safety of the public if an attack were to occur at a chemical plant. Overall, the legislation to require ISD at high-risk chemical facilities should be adopted as it will help to improve the overall security of the public, plant workers, and the environment.

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Editor-in-chief Alyssa Azzano would like to thank the following people for their contributions to this issue of the Chemical Engineering Newsletter:

Faculty Advisor: Prof. David Murhammer
Contributors: Amber Johnson, Michael Lee, Jaro Lepic, Allison Robinson, and Laura Northrup

Your help is much appreciated!

Interested in speaking at professional seminar? If so, then contact AIChE Student Chapter President Alex Carli at alex-carli@uiowa.edu for details and availability!

Would you like to make a tax-deductible contribution to the University of Iowa AIChE Student Chapter? Please contact Prof. David Murhammer at david-murhammer@uiowa.edu for more information.

Congratulations to the AIChE Student Chapter officers for the Fall 2010 Semester:

President: Alex Carli
Vice President: Abby Neu
Secretary: Ethan Guio
Treasurer: Laura Northrup
Spooky Sprint Coordinator: Rachel Crome
Webmaster: Na Yeon Kang
ChemE Car Competition Chair: Steve Reiner

Take a look to see where current AIChE members are spending their summer break:

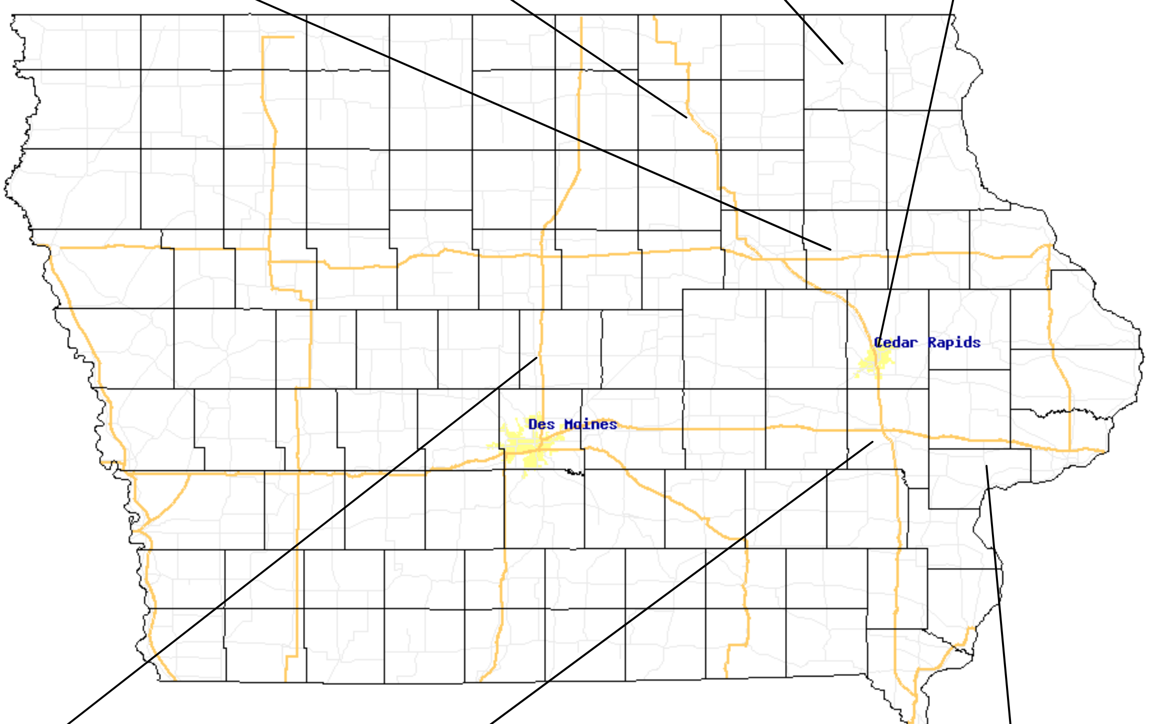
In the State of Iowa-

Charles City:
Ethan Guio– Pollution Prevention Intern at Cambrex Pharm.

Decorah:
Amber Johnson- Pollution Prevention Program

Cedar Rapids:
Alyssa Azzano– Genencor Intern
Kimberly Helmkamp– Genencor Intern
Austin Swartz– Genencor Intern
Collette Blake– Genencor Intern
Justin Hahn– Rockwell Collins Intern

Waterloo:
Tom Johnson– Hydrite Chemical Co. Internship



Ames:
Annie Kock– National Science Foundation REU

Iowa City/Coralville:
Kyle Merrill– Pharmaceutical Research with Dr. Jennifer Fiegel
Kenny Mineart– Research with Dr. Julie Jessop
Barbara McMullen– Research with Dr. Allan Guymon
Mohamed Elkhair– Research with Dr. Peeples
Laura Northrup– Pharmaceutical Research with Dr. Salem
Jacob Brandenburg– Intern at Integrated DNA Technology Inc.
Na Yeon Kang– Research with Dr. Julie Jessop
Meeshanthini Vijayendran– Research with Dr. Philibert in the UI College of Medicine
Spencer Heaton– Research with Dr. Leddy
Michael Toraason– Research with ICRU for Dr. Kohen
Collin Peterson– UI Facilities Management Energy Control Room
Jabob Robbins– Research with Dr. Leddy

Muscatine:
Laura Mozdzen– Monsanto Internship
Scott White– Monsanto Internship

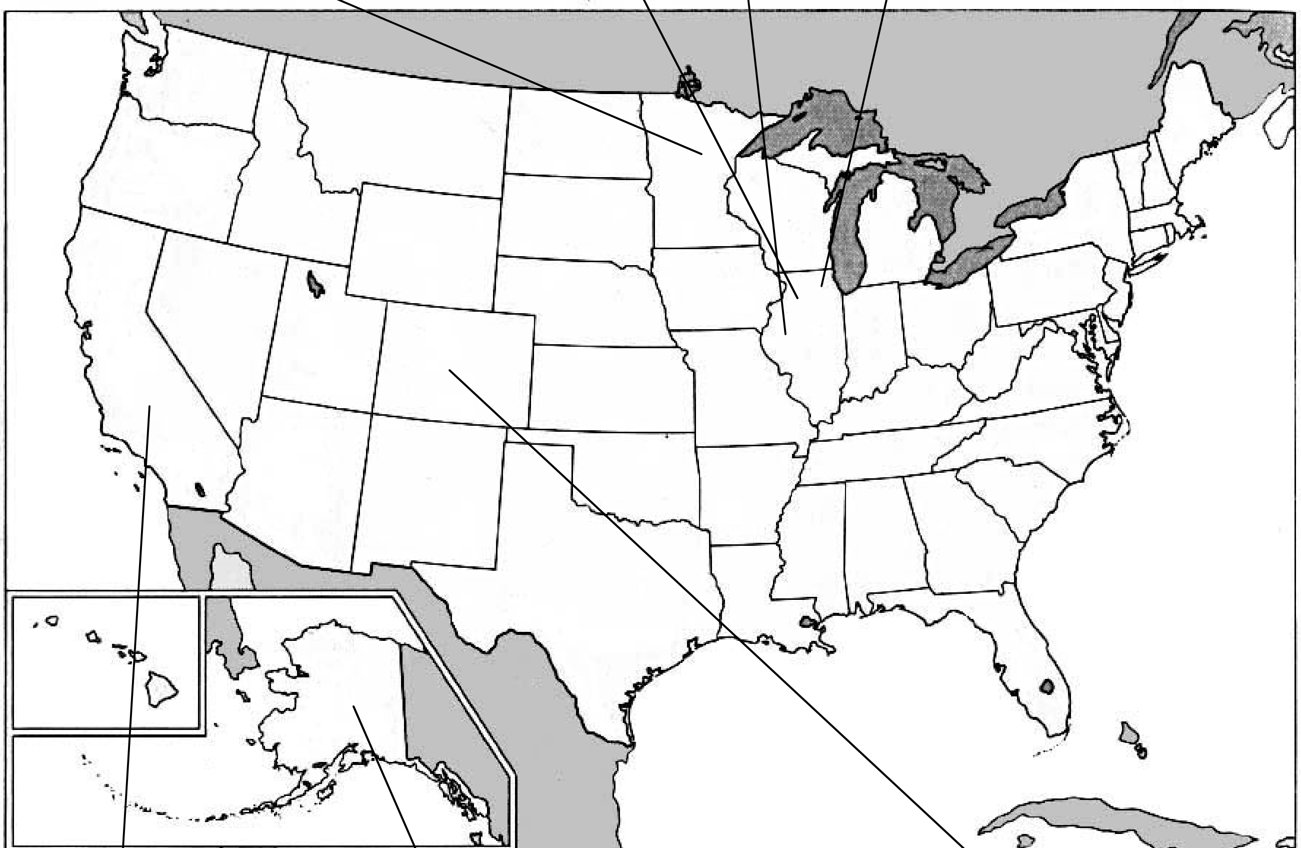
Around the Country-

Argonne, IL
Michael Lee– Argonne Laboratory Internship

Minnesota
Nick Job– Upsher-Smith Internship

Belvidere, IL
Rachel Crome– General Mills Internship

Lemont, IL
Jesse Calderon– Citgo Oil Refinery Internship



California:
Stephanie McCoy– REU with NASA

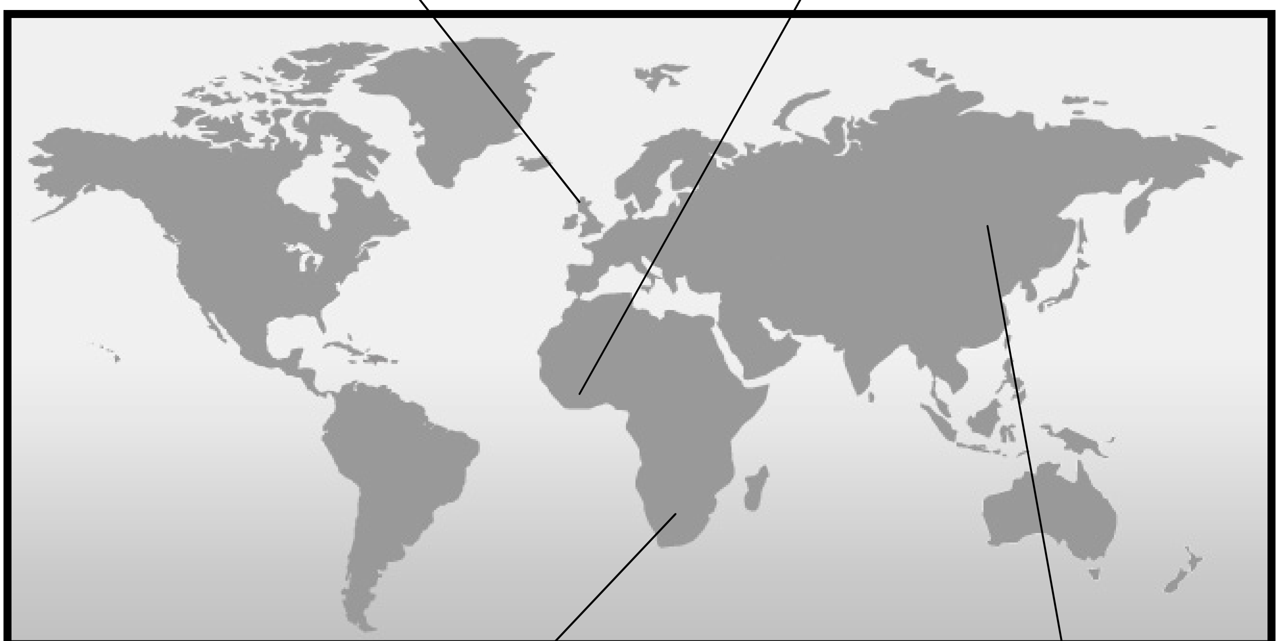
Alaska:
Maribel Treto-Schlumberger Internship

Colorado:
Ally Robinson– REU at NREL

& Around the World!

Ireland
Samantha Westerhof– Study Abroad Experience

Ghana, Africa
Nathan Rourke– UI Engineers Without Borders\Project



South Africa
Austin Gunn– World Cup

China
Stephanie McCoy-Teaching English