National Association of SARA Title III Program Officials
Concerned with the Emergency Planning and Community Right-to-Know Act

May 10, 2010 *Electronically Submitted – via e-mail.*

Chemical Safety and Hazard Investigation Board
Attn: D. Horowitz
2175 K St NW, Ste 650
Washington, DC 20037

Re: Comments to Docket No. CSB-10-01

Dear CSB:

The National Association of SARA Title III Program Officials (NASTTPO) is made up of members and staff of State Emergency Response Commissions (SERCs), Tribal Emergency Response Commissions (TERCs), Local Emergency Planning Committees (LEPCs), various federal agencies, and private industry. Members include state, tribal, or local government employees as well as private sector representatives with Emergency Planning and Community Right to Know (EPCRA) program responsibilities, such as health, occupational safety, first response, environmental, and emergency management. The membership is dedicated to working together to prepare for possible emergencies and disasters involving hazardous materials, whether they are accidental releases or a result of terrorist attacks. Thank you for the opportunity to comment on this proposal.

NASTTPO strongly supports this effort. There is a tremendous need for a systematic analysis of inherently safer process assessment and implementation. CSB is correct to take this approach in setting the tasks for the NAS study authorized by Congress. We believe CSB has correctly interpreted the intention and objectives of Congress with this project and, specifically, that Task 1 is critical to the proper completion of Task 2.

With the understanding that we broadly support and endorse the approach being taken by CSB, we have some suggestions:

1. We agree that NAS should convene an expert panel. Our suggestion is that the expert panel explicitly includes individuals with community-based emergency planning and emergency response backgrounds. This would be in addition to people with experience in community organization and work with disadvantaged individuals.

   Our thinking on this topic is based upon several fundamental beliefs. First, that inherently safer processes or technology does not equate with the absence of accidents. We anticipate that the potential impacts on a community and the need for community-based emergency planning and response will need to be more sophisticated than the current approach. Now we are typically focused on evaluating the impacts of an accident based on the quantity of stored hazardous chemicals. It is possible that the analysis of accident scenarios at facilities practicing inherently safer processes may change to looking at releases of in-process materials and a response scenario where the reaction by-products involved present greater hazards that stored precursor chemicals and products.

   Second, that there is a fundamental difference between planning and response, especially with regard to the standards and metrics that might relate to inherently safer processes and technology. Inherently safer processes no doubt involve changes in traditional delivery, storage and handling procedures. All of these potentially change the way communities evaluate and plan for chemical accidents.

2. When we look at inherently safer processes and technology it occurs to us there is some aspect of the analysis that needs to include the community context of the facility involved. What might be inherently safer in one place may actually increase risks in another due to changes in transportation or risks presented by the unique conditions of a facility and where it sits in a community. A focus solely

on the engineering aspects of inherently safer processes is too limited in our view. It is quite possible that the Task 1 activities described in the proposal are broad enough to encompass these issues, but it would be useful to articulate that the analysis conducted under Task 1 not be solely focused on life-cycle benefits and risks to the facility.

Thank you.

Timothy R. Gablehouse
President
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VIA ELECTRONIC FILE

May 10, 2010

Chemical Safety and Hazard Investigation Board
Office of Congressional, Public and Board Affairs
Attn: D. Horowitz
2175 K Street, NW
Suite 650
Washington, DC 20037

RE: Docket No. CSB-10-01
National Academy of Sciences Study
Comments of the American Chemistry Council

Dear Sir or Madam:

The American Chemistry Council (ACC) is pleased to provide comments to the Chemical Safety & Hazard Investigation Board (CSB) on the Board's proposed approach for the National Academy of Sciences (NAS) Study of the use and storage of methylisocyanate (MIC) at the Bayer Crop Science (BCS) facility in Institute, West Virginia.[1] ACC believes that no further work is required for completion of Task 1 and that the final deliverable under this task – a best practices guidance document - is unnecessary. Rather, NAS should study and use existing information related to Task 1 to complete Task 2 so that their focus remains solely on the mandated scope of the Study.[2] The basis for this recommendation is provided in our comments below.

ACC represents the leading companies engaged in the business of chemistry. ACC members apply the science of chemistry to make innovative products and services that make people's lives better, healthier and safer. ACC is committed to improved environmental, health and safety performance through Responsible Care®, common sense advocacy designed to address major public policy issues, and health and environmental research and product testing. The business of chemistry is a $689 billion enterprise and a key element of the nation's economy. It

[1] 75 Fed. Reg. 21223 *et seq.*
[2] Public Law 111-88: The Department of the Interior, Environment and Related Agencies Appropriations Act, 2010.

is one of the nation's largest exporters, accounting for ten cents out of every dollar in U.S. exports.

Safety and security have always been primary concerns of ACC members, and they have intensified their efforts, working closely with government agencies to improve security and to defend against any threat to the nation's critical infrastructure. These efforts have included stakeholder collaboration on defining inherently safer chemical processes, which CSB has identified as the first study task.

ACC appreciates the opportunity to comment on this proposed NAS Study. We look forward to future dialogue with CSB on the important IST issues discussed therein. Please contact me if you have any questions about our comments. I can be reached by phone at (703) 741-5247 or by e-mail at laurie_miller@americanchemistry.com.

Sincerely,

Laurie A. Miller

Director
Regulatory and Technical Affairs

Attachment

May 10, 2010
Comments of the
American Chemistry Council
On the Chemical Safety & Hazard Investigation Board
National Academy of Sciences Study

1. *Does the proposed Task Statement include the appropriate topics for consideration by the NAS? Are there any additional general or specific topics the NAS panel will need to consider in order to reach a satisfactory answer on the feasibility and costs of reducing the use and storage of MIC?*

ACC believes that no further work is required for completion of Task 1 and that the final deliverable under this task – a best practices guidance document - is unnecessary regardless. CSB should use the body of work that already exists or is underway about the definition of inherently safer technology (IST) and methods to evaluate IST alternatives. Rather, NAS should study and use the existing body of available work on IST to complete Task 2 so that their focus remains solely on the mandated scope of the Study. A complete risk analysis that includes IST as well as other risk reduction options should be included in the scope of work for NAS. The risk analysis should focus on the risk to the BCS operations and the potentially affected citizens and environment of the Kanawha Valley.

The objective of Task 1 appears to be to generalize the technical and cost aspects of IST assessments and translate these generalizations into a best practices guidance document to carry out Task 2 and possibly other chemical-specific IST evaluations. We believe that this goal is inappropriate. IST decisions are highly dependent upon extrinsic factors, such as location relative to population centers, end-user requirements such as ISO standards, GMP and FDA requirements, among others. To make recommendations based on the type of guidance that appears to be the objective of Task 1 could have unintended consequences regarding important factors such as product viability and whether risk is actually reduced or simply shifted elsewhere by implementing a particular IST alternative. Thus, we do not believe the development of the deliverables identified in Task 1 is either necessary or useful.

Should NAS identify gaps in the existing information or methodologies discussed in Task 1, we believe that the CSB should consult with process safety experts with relevant experience in assessment and implementation of IST concepts in order to develop recommendations on how to fill these gaps. Additionally, whether additional tasks are needed to conduct the Study would at this point be speculation, due to the myriad factors that must be considered in IST evaluations. NAS may find through their research of existing information on IST that additional tasks may be necessary to specifically address MIC.

Regarding the definition of IST, ACC recommends that CSB leverage the extensive work already completed or underway to define IST to achieve its mission. Process safety experts and other stakeholders have worked through the Center for Chemical Process Safety (CCPS),

academia and other credible organizations to define IST.[3] Additionally, work is currently being done by CCPS at the Federal Government's request to define IST more broadly to span the full lifecycle of the chemical manufacturing process including manufacturing and use, storage and transportation.[4] We have been made aware through the Chemical Sector Coordinating Council that related research is also being done by the Federal Government to develop metrics to quantify the potential impact of IST changes on process safety and security throughout the chemical manufacturing supply chain. CSB should wait until the metrics generated from this research are completed to determine if they will be useful.

Finally, we believe the charge under Task 1 to examine the impact of existing state and local regulatory programs which seek to promote inherently safer processes, would be ineffective in helping CSB carry out Congress' request. Such programs out of necessity attempt to simplify the complex nature of IST evaluations, have limited scope when it comes to analysis of site-specific conditions, and are more general overall; therefore they are not an effective tool in this context.

2. *If funds are available, should the CSB initiate a second, related study to consider the feasibility, costs, and benefits of inherently safer alternatives to other chemicals? For example, should a study consider alternatives to the use of hydrogen fluoride in refinery alkylation processes and/or to the use of chlorine in water treatment? What other chemicals or processes should be considered if a second study is undertaken?*

Based on our comments on question 1 above, we believe that funds that Congress provided to CSB are intended only to address Task 2. While Task 2 addresses specific processes at a single facility, the discussion of a potential "second, related study" suggests CSB is interested in evaluating chemicals and processes across a range of facilities. For example, chlorine gas is used by tens of thousands of water treatment facilities in the U.S. For any type of process, the feasibility, costs and benefits of using alternative chemicals depend on many site-specific factors. A broad, generalized study on one or more chemical processes would have little practical value for decisions regarding individual facilities.

3. *What kinds of backgrounds and expertise should be represented on the NAS panel?*

   The NAS panel should consist of chemical manufacturing experts that have extensive background in both evaluating and implementing IST concepts and approaches.

[3] CCPS Publication ISBN 978-0471-77892-9; Inherently Safer Chemical Processes – A Life Cycle Approach (2009).
[4] (Source: http://www.aiche.org/Conferences/Specialty/GCPS/IST.aspx).

4. *Is the proposed timetable appropriate?*

   We believe that one year would be sufficient for conducting Task 2. This work would involve studying and using the existing definition, and technical and cost feasibility aspects of Task 1, but without Task 1 deliverables.

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May 10, 2010

Attn: Daniel Horowitz
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Office of Congressional, Public, and Board Affairs
2175 K Street, NW, Suite 650
Washington, DC 20037

Re: Docket Number CSB-10-01

Questions for Public Comment

1. Does the proposed Task Statement include the appropriate topics for consideration by the NAS? Are there any additional general or specific topics the NAS panel will need to consider in order to reach a satisfactory answer on the feasibility and costs of reducing the use and storage of MIC?

Answer: Given the near miss of another Bhopal magnitude disaster at Bayer's Institute West Virginia facility, it is reasonable that Congress would be interested to know if this kind of risk is preventable. On April 21, 2009 The Energy and Commerce Committee issued a memo:
http://energycommerce.house.gov/Press_111/20090421/supplementalmemo.pdf
The Committee raised serious questions about why the Bayer facility is the only U.S. facility that continues to store and use methyl isocyanate (MIC) to make an obsolete pesticide more than 25 years after the Bhopal tragedy and after all other U.S. chemical facilities have adopted safer processes.

Given the widespread availability of commercially operating facilities using safer processes across a wide range of facilities that once used, stored or made substances such as MIC or similar toxic-by-inhalation (TIH) substances that pose catastrophic risks up to twenty-five miles from their point of release, the NAS should focus on three areas:

A) The relatively few exotic processes still in use that pose inherently dangerous risks to employees and surrounding communities.
B) Advice to the Chemical Safety and Hazard Investigation Board on ways to incorporate safer process recommendations into each of their accident investigations.
C) Conduct a literature search (see attached) that documents the hundreds of applications of safer chemical processes now in use and the benefits in terms of costs savings, reduced liability and fewer regulatory obligations as a result of their conversion to safer processes.

2. If funds are available, should the CSB initiate a second, related study to consider the feasibility, costs, and benefits of inherently safer alternatives to other chemicals? For example, should a study consider alternatives to the use of hydrogen fluoride in refinery alkylation processes and/or to the use of chlorine in water treatment? What other chemicals or processes should be considered if a second study is undertaken?

Answer: Most U.S. refineries already use safer alternatives to the most hazardous hydrogen fluoride (HF) process. The NAS should now focus on the most promising safer alternative, the solid acid process. This process appears to have the greatest potential to eliminate catastrophic risks to refinery employees and surrounding communities.

A study of the use of chlorine gas in water treatment, however, may not be the best use of NAS time and resources given the many operating alternatives, all of which eliminate these catastrophic risks to employees and surrounding communities. A literature search (see attached) of these alternatives should prove invaluable for the remaining water facilities still using chlorine gas as they pursue safer alternatives best suited for their facility.

3. What kinds of backgrounds and expertise should be represented on the NAS panel?

Answer: We strongly recommend that the panel be composed of experts who are free of conflicts of interest, represent a range of stakeholders including non-management employees, community representatives, academic and environmental experts.

4. Is the proposed timetable appropriate?

Answer: Yes, one year should be more than enough time to assemble the wealth of data, literature and commercially operating safer alternatives in use in facilities across the U.S. We caution against any study that postpones the implementation of common sense, widely available alternatives that can eliminate catastrophic risks to millions of Americans.

Additional Considerations and Background:

The Urgency of the Post 9/11 Era:
The September 11th terrorist attacks successfully used our own infrastructure against us with tragic results. They also demonstrated that tight perimeter security, such as in the case of the Pentagon, is incapable of preventing such attacks. Should a chemical plant be targeted, a truck bomb, a small plane, helicopter or a high powered rifle would easily render the industry's current reliance on fence-line security totally useless. In fact, U.S. chemical facilities have been referred to by then Senator Obama on the Senate floor as ***"stationary weapons of mass destruction."***

The recent attempted terrorist attack in New York City's Times Square is a sobering reminder of the nearly nine years of neglect following the 9/11 attacks. The vulnerability of U.S. chemical plants to terrorism and serious accidents such as the 1984 disaster in Bhopal, India and in the fatal 2008 accident in Institute, West Virginia have been widely recognized. The potential magnitude of these risks far surpasses the 9/11 attacks. Once released these chemicals and gases can remain dangerous for up to 14 miles in an urban area (20 miles in a rural area) and put the lives of millions of Americans at risk. **A December 2009 Congressional Research Service analysis of Environmental Protection Agency (EPA) data identified 91 chemical facilities that each put 1,000,000 or more Americans at risk.**

The nature of these risks meets any definition of a weapon of mass destruction. The manner in which people would be killed and injured is terrifying. Poison gases such as chlorine will literally melt the lungs of its victims causing them to drown in their own lung fluid (pulmonary edema). Survivors could be left with life long disorders.

Following the 9/11 attacks it was reported that 9/11 ringleader, Mohamed Atta, visited a Tennessee chemical plant asking lots of questions (December 16, 2001 Washington Post). In the first six months of 2007 at least five successful terrorist attacks in Iraq used relatively small (150 to 250 pound) cylinders of chlorine gas to kill dozens of people. As a result the Department of Homeland Security (DHS) began briefing local bomb squads and chemical plants across the country. (April 24, 2007 USA Today) In February and April of 2007 thefts of 150 pound cylinders of chlorine gas occurred in California prompting questions by members of this Committee to the DHS about their response to these thefts, any other thefts and plans to eliminate these vulnerabilities by using inherently safer technologies.

U.S. chemical facilities were not built or designed to defend against terrorist attacks. And predicting where an attack will take place is a fool's errand. No one predicted that Timothy McVeigh would attack the Federal Building in Oklahoma City in 1995, killing 168 innocent people.

On June 25, 2007, duPont Chairman Charles O. Holliday Jr. told the media that he worries most about a computer system failure or a security breach at one of the company's chemical plants around the world. "I feel very comfortable that we've taken all the reasonable steps, but obviously if someone wants to fly an airplane into a plant, it's very hard to guard against it," said Holliday.

Stephen Flynn, Senior Fellow in National Security Studies at the Council on Foreign Relations warned in his 2007 book, The Edge of Disaster, " "...While attacks on the electric grid, oil and gas facilities, major ports, and the food-supply system have the potential to create the greatest cascading economic effects, it is chemical facilities near urban population centers that have the potential to inflict the greatest casualties. Placing them at the top of the list of priorities is obvious...In most cases, chemical plants that threaten nearby populations can switch to less dangerous substances. This practice is known as "inherently safer technology," or IST…Without a strong mandate from the federal government, it's unrealistic to think they ever will. Yet voluntary compliance is the premise of the legislation Congress passed last fall [2006]; the new rules rest on the assumption that companies will now suddenly begin taking steps they have so far refused to contemplate."

A Terrorist Attack or Accident Would be Catastrophic:
--- In July, 2004, the Homeland Security Council estimated that an attack on a single chlorine facility could kill 17,500 people, severely injure an additional 10,000 and result in 100,000 hospitalizations and 70,000 evacuations.

--- In January, 2004, the U.S. Naval Research Laboratory testified before the Washington, D.C. City Council warning that 100,000 people could be killed or injured in the first 30 minutes of a catastrophic release of a tank car of chlorine or similar chemical within blocks of Capitol Hill. They further estimated that people could "die at rate of 100 per second."

--- In June, 2003 FBI specialist on weapons of mass destruction, Troy Morgan, in a speech at a chemical industry conference warned, "You've heard about sarin and other chemical weapons in the news. But it's far easier to attack a rail car full of toxic industrial chemicals than it is to compromise the security of a military base and obtain these materials."

Commercially Available Safer Processes Prevent Disasters:
In February 2008, the CEO of Association of American Railroads said, ***"It's time for the big chemical companies to do their part to help protect America. They should stop manufacturing dangerous chemicals when safer substitutes are available. And if they won't do it, Congress should do it for them…."***

There are commercially available safer alternatives for virtually all of the poison gas or toxic-by-inhalation (TIH) substances that pose the greatest risks to hundreds of urban areas. The Center for American Progress (CAP) conducted an analysis of EPA's Risk Management Program data and identified 284 facilities that have converted since 1999. See full report at: http://www.americanprogress.org/issues/2006/04/b681085_ct2556757.html

Examples of conversions from TIH chemicals and continuing threats include:

--- More than 550 water treatment facilities (including Washington, D.C.) converted to safer alternatives such as ultraviolet light, eliminating the use of **chlorine** and **sulfur dioxide** gas. At least 73 water treatment plants still threaten more than 100,000 people.

--- Ninety-eight petroleum refineries use safer alternatives to **hydrogen fluoride (HF)**. But 50 refineries still threaten millions of people with the use of HF.

--- At least 36 electric power plants use safer alternatives to **anhydrous ammonia** gas such as dry urea. But 166 power plants still use anhydrous ammonia gas each threatening an average of 21,506 people.

--- The Blue Plains sewage treatment plant (like more than 550 other water treatment plants all over the US) in Washington, D.C. halted its use of chlorine and switched to safer chemicals just eight weeks after the 9/11 attacks due to fears of another attack. The plant had seven rail cars of chlorine on sight following the 9/11 attacks. The conversion only cost approximately $0.50 per year for each water customer. In other words, by using safer technologies we can neutralize and eliminate targeting by terrorists and prevent catastrophic accidents as well at negligible costs.

--- In November 2009, the Clorox Company announced plans to convert all seven of its U.S. facilities. This conversion will eliminate Clorox's bulk use of chlorine gas and risks to more than 13 million people in nearby communities.

--- In December 2008 Dow Chemical and K2 Pure Solutions announced an agreement in which K2 Pure would supply Dow's Pittsburgh, California facility with small quantities of chlorine gas produced in just-in-time batches by K2 Pure, thus eliminating the risks associated with bulk on-site storage and transport of chlorine gas.

This CAP analysis shows that 87% of the converted facilities spent less than $1 million and one third expected to save money, particularly from reduced liability costs and reduced regulation compliance costs. Clearly these conversion costs pale in comparison to the cost of disaster response, relocating communities, defending against personal injury law suits or resolving environmental clean up liability or even conventional security costs.

While the CAP analysis also proves the feasibility of safer alternatives, CAP estimates that at this rate of conversion, without any new regulatory requirements, it will take 45 years to eliminate hazards that pose the highest risk to America's hometowns. A 2008 CAP analysis

identified 300 chemical facilities that together put 110 Million Americans at risk. The DHS needs the authority to prioritize the conversion of the highest risk plants first.

A 2006 GAO report (GAO-06-150), Homeland Security DHS Is Taking Steps to Enhance Security at Chemical Facilities, But Additional Authority Is Needed, concluded, “Implementing inherently safer technologies potentially could lessen the consequences of a terrorist attack by reducing the chemical risks present at facilities, thereby making facilities less attractive targets.”

A 2006 report by the National Academy of Sciences issued a report called “Terrorism and the Chemical Infrastructure: Protecting people and Reducing Vulnerabilities” which said, “The most desirable solution to preventing chemical releases is to reduce or eliminate the hazard where possible, not to control it. This can be achieved by modifying processes where possible to minimize the amount of hazardous material used, lower the temperatures and pressures required, replace a hazardous substance with a less hazardous substitute, or minimize the complexity of a chemical process.”

A Government Accountability Office report (GAO-05-165) identified chlorine gas and 90-ton chlorine rail cars as "among the top five terrorist-related wastewater system vulnerabilities." Among the top three recommendations: "Replacing gaseous chemicals used in wastewater treatment with less hazardous alternatives." In addition, the largest majority of experts gave replacing these chlorine facilities the highest priority for federal funding.

The Benefits of Safer Technologies:
The use of safer technologies offers a more competitive and stable business plan with fewer regulations, potentially zero liability, sustainable profitability, better relationships with workers and neighboring communities and no threat of a catastrophic attack or accident. Specifically, the use of safer technologies will likely result in a facility no longer being subject to federal safety and security regulations.

Chemical facilities located on site at nuclear power plants, water treatment works, iconic facilities such as Disney World, Camp David, etc. also need to be considered for priority protection. However, using safer technologies as a countermeasure at these facilities will lessen the lethality that an attack on them would pose. Given the finite nature of government and industry resources it is urgent that we use safer technologies to reduce the consequence of an accident or attack. By doing so we eliminate risks, safeguard communities and save scarce money and resources to protect targets that cannot be so neutralized (airports, U.S. Capitol, etc.).

Sincerely,

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Comments of the
United Steel, Paper and Forestry, Rubber, Manufacturing, Energy, Allied Industrial and Service Workers International Union
AFL-CIO.CLC
on the
Proposed National Academy of Sciences Study
U.S. Chemical Safety and Hazard Investigation Board
Docket CSB-10-1
May 10, 2010

The United Steelworkers Union strongly supports the study proposed by the CSB in its April 23 *Federal Register* notice. However, as we explain below, we believe the scope of the study should be expanded beyond an examination of the use and storage of methyl isocyanate to a more general examination of inherently safer technologies, centered on a number of case studies.

The USW represents 850,000 North American workers in a large variety of industries, many of whom make or use large quantities of hazardous chemicals on the job. Specifically, the USW is the predominant union in oil refining, chemicals, metals, paper and rubber. USW members have been killed and injured in many of the catastrophic accidents investigated by the CSB, most recently the April 2 explosion and fire which killed seven workers at the Tesoro refinery in Anacortes, Washington. Our members and their families are exposed to the risk of such accidents, both as employees of potentially dangerous enterprises and as residents of the surrounding communities. And as a union with a strong environmental program, we are deeply concerned with risks to the public in general. We believe that many of those risks could be eliminated or greatly mitigated through the wider adoption of inherently safer technology (IST). We therefore welcome the proposed National Academy of Sciences study.

The proposal as written is limited to a general study of inherently safer technology, and a specific study of the storage and use of methyl isocyanate. The author of these comments has seen first hand the impact of a major release of MIC. I was part of an international team which traveled to Bhopal, India after the December 2-3, 1984 release of MIC from a Union Carbide pesticides plant, which killed thousands and continues to kill from the long-term effects of the respiratory injuries suffered that night. We interviewed hundreds of workers and residents who survived the release, and published our findings in *The Trade Union Report on Bhopal* (International Confederation of Free Trade Unions and International Chemical, Energy and General Workers Federation, Geneva, 1985).

The tragedy was compounded by the fact that large scale storage of MIC is unnecessary. MIC is a chemical intermediate, primarily used to make carbamate pesticides. It could have been synthesized in small quantities for immediate use. Instead, Union Carbide chose to make and store it in large quantities to be used at the company's convenience. In fact, DuPont currently uses a process which largely eliminates storage of MIC in its LaPorte, Texas plant (*http://www.scienceblog.com/community/older/2003/C/2003411.html*).

Unfortunately, Bayer Crop Science chose the high storage route for its Institute, West Virginia plant. As a result – and as the CSB has documented – the August 28, 2008 explosion and fire in that facility could have released almost 14,000 pounds of MIC. Bayer has announced plans to eliminate aboveground storage of MIC, but intends to continue to store up to 40,000 pounds underground. This reduces the risk of an airborne release due to a breached tank, but not the risk of a runaway reaction in the tank or a release from an aboveground unit connected to the tank. Underground storage would not have prevented the Bhopal release.

For those reasons, the USW supports the proposed study. The review of IST specified as the first Task in the *Federal Register* notice is entirely appropriate. The examination of MIC use and storage that is the subject of the second Task is also appropriate, but it should be slightly expanded. According to several online documents (most notably the Wikipedia article on MIC) the chemical has been used in the formulation of some rubber and adhesive products. It is not clear whether these uses are current, or whether MIC has been replaced by safer substitutes in all such processes. Either way, an investigation of other uses would be useful.

In the questions for public comment, the *Federal Register* notice asks whether a second case study is warrented. The USW urges the CSB to include at least one additional study and, if possible, several. A single case study is simply not sufficient to adequately explore the issue of IST. The additional studies should be included even if they cannot be completed to the same level of detail as the MIC study.

Three studies in particular should be considered. Perhaps the single most dangerous operation in all of American industry is the use of hydrogen fluoride in oil refinery alkylation. There are two alternatives currently in use – sulfuric acid and hydrogen fluoride modified by an agent that raises its boiling point. Both have their hazards. Solid acid catalysis appears to be a much safer alternative (Mukherjee et. al., *Oil and Gas Journal*, November 9, 2009, pp. 1-9). However, no refinery in the United States has installed a solid acid catalyst alkylation unit. Far more people are at risk from hydrogen fluoride than from methyl isocyanate. Although the CSB's appropriation includes language specifying the MIC study, a hydrogen fluoride study could be even more important.

Two additional studies would also be instructive. Both involve the use of chlorine and chlorine compounds. Chlorine gas is widely used as a disinfectant in municipal water systems. Chlorine is typically stored in large quantities on site. Liquified chlorine also presents a threat in transport, typically by railcar. Chlorine and chlorine dioxide are also used in the paper industry as bleaching agents. A study by the USW of 78 unionized paper mills (scheduled for publication later this year) found that 19 use elemental chlorine and 38 use chlorine dioxide in large enough quantities that their storage exceeds the OSHA Process Safety Management thresholds of 1500 lbs and 1000 lbs respectively. A 2007 study of worst-case scenarios in 74 paper industry Risk Management Plans submitted to EPA found an average of 77,000 people in each vulnerability zone (Fidis, *Pulp Fiction: Chemical Hazard Reduction at Pulp and Paper Mills*, U.S. PIRG Education Fund, Washington, 2007). Safer alternatives exist, both for municipal water systems and for pulp and paper bleaching. The NAS study could be critical in determining why they have not been more widely adopted.

Of course other case studies could also be included. Possibilities include the use of phosgene and boron trifluoride in manufacturing a variety of products.

To summarize, the USW strongly supports the proposed study of inherently safer technologies with the methyl isocyanate case study. We believe that at least one, and preferably several case studies should be included. As the representative of workers in many of the relevant industries, we would be happy to cooperate in any way we can.

Respectfully submitted,

Michael J. Wright
Director of Health, Safety and Environment
United Steelworkers

May 10, 2010

Via electronic file

Docket No. CSB-10-01
Chemical Safety and Hazard Investigation Board
Office of Congressional, Public and Board Affairs
Attn: D. Horowitz
2175 K Street, NW
Suite 650
Washington, DC 20037

Subject: Comments of NPRA, the National Petrochemical & Refiners Association, and the American Petroleum Institute on the Proposed National Academy of Sciences Study Scope Published in the Federal Register on April 23, 2010 (75 Fed. Reg. 21223 *et seq.*)

The American Petroleum Institute (API) and the National Petrochemical and Refiners Association (NPRA) submit the following comments on the Chemical Safety Board's (CSB's) "**Proposed National Academy of Sciences Study Scope**" published in the Federal Register on April 23, 2010 (75 FR 21224).

API is a national trade association with nearly 400 member companies that are involved with all aspects of the oil and natural gas industry. NPRA members include more than 450 companies, including virtually all U.S. refiners and petrochemical manufacturers.

API and NPRA submit these comments to provide context to issues found within the Proposed National Academy of Sciences Study Scope**.** Specifically, we believe that the scope of the study is not consistent with the original appropriations language and that Task #1 is not suitable or appropriate because it is too broad in nature to make definitive conclusions on inherently safer chemical processes.

Scope of the Study is not Consistent with the Original Appropriations Language

The scope of the National Academy of Sciences (NAS) proposed study goes beyond the language in Public Law 111-88, 123 Stat. 2949 which states "[t]hat of the funds appropriated under this heading, $600,000 shall be for a study by the National Academy of Sciences to examine the use and storage of methyl isocyanate including the feasibility of implementing alternative chemicals or process and the examination of the costs of alternatives at the Bayer CropScience facility in Institute, WV." This Congressional appropriation does not call for a study to "review and evaluate the state of the art in

inherently safer process assessments and implementation" as specified under Task #1 of the Proposed Study. Based on both House and Senate Appropriations Committee reports, the language approved in conference specifically requests an investigation of methyl isocyanate (MIC) and its use at the Bayer Institute, West Virginia site. The conference language did not expand the study to include alternatives to chemicals other than MIC. Studies for alternatives such as chlorine are simply outside of the scope intended by Congress. In order for NAS to expand the study, the Chemical Safety Board (CSB) is required to notify the Appropriations Committee to approve reprogramming of the original appropriations language (See House Appropriations Committee report (111-180) on the general matter of "reprogramming). There is no record that the CSB notified the Appropriations Committee.

Topics covered under the first four bullet points of Task 2 are appropriate and within the scope of the study called for by Congress. The fifth bullet point is neither appropriate to the scope of the study nor needed to reach a satisfactory answer on the feasibility and costs of reducing the use and storage of MIC.

The Study is Infeasible and Inappropriate as Currently Written

Task 1 and bullet point 5 of Task 2 in the National Academy of Science ("NAS") proposal are neither suitable nor appropriate. These tasks attempt to make a comparison that is too broad in nature to provide definitive conclusions on inherently safer chemical processes.

The refining and petrochemical industries continue to develop advanced technologies and processes that reduce risks associated with handling hazardous chemicals. It is not appropriate to describe certain technologies or chemicals as inherently safer than an alternate with no further description and consideration of site specific attributes. In fact, no valid methods have been developed in the chemical engineering discipline to even make such a comparison.

Inherently safer technology ("IST") and design are operation and site specific evaluations and decisions. A technology or chemical can only be described as inherently safer than a different technology or chemical when all hazards and exposures associated with a specific site operation are considered including logistics, location and the potentially affected population. In addition to hazards, location, surrounding population, and both technical and economic feasibility must be considered. These elements are operation specific. Public Law 111-88, 123 Stat. 2949 provides that for the NAS study to be appropriate, it must focus solely on options to eliminate or reduce the risks associated with the storage and use of MIC at the Bayer CropScience Institute Site.

Task 1 of the study is not feasible if extended beyond the evaluation of the Bayer Crop Science Institute site. IST assessments, life-cycle benefits, and risks from the adoption of inherently safer technologies can only be done on a per site and per process basis. Broad generalization is not applicable in an individual IST decision because there are no valid methods with which to quantify or compare different processes in such a wide-ranging manner. Economic evaluation methods vary for each industry, company, locations, and site and therefore cannot be calculated with a generic equation. The original language in the congressional appropriations public law reflects the true intent of the study and the only feasible study the NAS can realistically perform given that IST is a conceptual and philosophical approach to engineering. The scope states that the NAS will examine the use and storage of MIC to include the feasibility of alternative chemicals use or processes and an examination of the cost of these alternatives specifically at

the Bayer CropScience facility. The NAS does not have the information required to develop comprehensive conclusions for a chemical or a process beyond the Institute site.

Specific IST standards and metrics cannot be adopted industry wide, since there is no valid way to determine whether one process at a particular site is inherently safer than a process at a different site. NPRA and API recommend that the NAS scope of work remain focused on the Congressional mandate of the MIC use and storage at the Bayer CropScience facility in Institute, West Virginia.

The NAS Should Make Better Use of Current and Previous Work on IST

Inherently Safer Technology is not a new concept. Use of the term IST began in the process industries in the 1970s. There has been extensive work and research conducted by several organizations and academia on the best practices approach to IST. Most recently the Department of Homeland Security's Chemical Security Analysis Center ("CSAC") engaged the Center for Chemical Process Safety (CCPS) to create a definition of IST for use by the agency. The CSAC requested CCPS participate in its process due to the Center's extensive experience with IST. For example, in 2009, CCPS published the second edition of its book, *Inherently Safer Chemical Processes: A Life Cycle Approach.* This publication is based on more than 40 years of research and examination of the IST concept. Accordingly, NPRA and API recommend that CSB utilize the definition of IST in development by CSAC and that Task #1 associated with the development of an alternate definition of IST be excluded from the NAS scope of work.

A Study of Chemical Alternatives will be Problematic

This same logic applies to the CSB statement proposing to examine potential alternatives to other chemicals used in industry, specifically hydrogen fluoride and chlorine. Risk reduction decisions must consider all hazards and potential exposures as well as potentially conflicting goals and impacts. Other factors that must be considered are economics, resource allocation (including capital, research and development resources, operating costs), feasibility, reliability, and the effectiveness of other process risk management features (passive, active, procedural). These considerations may result in different options for specific situations for a given technology or chemical. In unique environments, hazards and other factors may be different which would lead to alternate choices about the appropriate technology or chemical. Therefore, any conclusions for specific chemical alternatives in terms of IST are unattainable considering the study's limitations of specific site characteristics. This may result in the transfer of risk to other locations and an overall increase of risk.

NPRA and API members are concerned that broad generalized statements on IST could have a detrimental impact if applied generically to industry. IST specialists, scientists and academia all agree that IST can only be performed with consideration of all hazards and risks, both of which vary significantly site by site.

Suggested Panelists and Expertise

The following individuals are suggested for their technical expertise on the issue of IST:

- Iclal Atay, Bureau Chief, NJDEP/BRP at NJ Dept of Environmental Protection, iclal.atay@dep.state.nj.us, (609) 633-6187

- Dennis Hendershot, Staff Consultant, AIChE, Center for Chemical Process Safety, Allentown, PA,dennis.hendershot@gmail.com, (610) 419-4780

- All appropriate technical and economic experts with understanding of the Bayer CropScience manufacturing process.

Suggested Changes Will Result in a Feasible Study Scope

NPRA and API support the CSB recommendation to study the use and storage of MIC and potential alternative processes or chemicals at the Bayer CropScience facility. The expanded scope proposed by the National Academy of Science goes beyond the Congressional mandate, and is not feasible if the analysis goes beyond the recommendation to study MIC use and storage at the Bayer CropScience facility in Institute, West Virginia.

We appreciate the opportunity to provide comments on the Proposed National Academy of Sciences Study Scope**.** If you have any questions please contact Lara Swett, NPRA Safety & Health Director, at 202-457-0480 or Ron Chittim, API Senior Policy Advisor at 202-682-8176 (Chittim@api.org).

Sincerely,

Lara Swett
Director, Health and Safety
NPRA

May 10, 2010

Chemical Safety and Hazard Investigation Board
Office of Congressional, Public, and Board Affairs
Attn: Dr. Daniel Horowitz
2175 K Street, NW, Suite 650
Washington, DC 20037
Via electronic comments: *<nascomments@csb.gov>*

Re: ***Comments to CSB–10–01 on CSB funding for a Study by the National Academy of Sciences to examine the use and storage of methyl isocyanate***

Attention Chairman John S. Bresland:

The proposed study by the National Academy of Sciences (NAS) to examine the use and storage of methyl isocyanate should be expanded to include an evaluation of inherently safer technology alternatives to the deadly catalytic chemical hydrogen fluoride (HF) that is still being widely used in the U.S. oil refining sector in the alkylation units to produce high octane gasoline products. The catalyst HF may pose an even greater hazard to American communities than the use of methyl isocyanate.

The lives of millions of people are at risk living downwind of local refineries and in populated downwind neighborhoods several miles away, since so many large oil refineries continue to use the deadly catalyst HF. Recent accidents at refineries (Citgo's East Corpus Christi refinery on July 19, 2009) in the last two years where HF was released and workers injured highlight the critical need for the Chemical Safety and Hazard Investigation Board to add HF to the upcoming NAS study.

The expanded NAS study is needed because of serious risk concerns about the potential for an airborne release of the HF chemical, which is highly toxic by inhalation and could adversely impact the health and safety of workers and the public in 51 refinery communities located in 20 states. These HF refineries are located in several large urban areas like Los Angeles, Houston, Chicago, Philadelphia, Salt Lake City, Corpus Christi.

In an August 2005 report Needless Risk: Oil Refineries and Hazard Reduction, U.S. PIRG identified 51 U.S. oil refineries that are still using the deadly catalyst hydrofluoric acid or HF--about 1/3 of existing refineries. The good news is that two thirds of U.S. refineries are using processes that do not include HF, reducing risk to the surrounding communities.

Please consider expanding and adding the deadly catalytic chemical hydrogen fluoride to the proposed study by the National Academy of Sciences examining the use and storage of methyl isocyanate. The NAS study must include an evaluation of safer alternatives to the deadly catalytic chemical hydrogen fluoride.

Sincerely yours,

Elizabeth Hitchcock
Public Health Advocate
U.S. Public Interest Research Group
218 D Street SE
Washington DC 20003
202-461-3826
Elizabeth@pirg.org

VIA ELECTRONIC FILE

May 10, 2010

U.S. Chemical Safety and Hazard Investigation Board
Office of Congressional, Public and Board Affairs
Attn: D. Horowitz
2175 K Street, NW
Suite 650
Washington, DC 20037

RE: CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD Docket No. CSB–10–01

Dear Sir or Madam:

The American Chemistry Council's Hydrogen Fluoride Panel (Panel) is pleased to provide comments to the U.S. Chemical Safety & Hazard Investigation Board (CSB) on the Board's proposed approach for the National Academy of Science (NAS) Study of the use and storage of methylisocyanate (MIC) at the Bayer Crop Science (BCS) facility in Institute, West Virginia (ref.).[1] Specifically, the Panel is commenting on the following questions, posed by the CSB:

> *If funds are available, should the CSB initiate a second, related study to consider the feasibility, costs, and benefits of inherently safer alternatives to other chemicals? For example, should a study consider alternatives to the use of hydrogen fluoride in refinery alkylation processes and/or to the use of chlorine in water treatment? What other chemicals or processes should be considered if a second study is undertaken?*

The Hydrogen Fluoride Panel[2] represents major North American manufacturers of hydrofluoric acid. The Panel was chartered in 1988 to address issues relating to the use, transportation, emergency response, health effects, environmental impacts and regulation of Anhydrous Hydrogen Fluoride and Hydrofluoric Acid (collectively referred to as HF). Members of the Panel are committed to the responsible use and handling of hydrogen fluoride, improvement of tank car safety and the prevention of incidents resulting in releases.

[1] 75 Fed. Reg. 21223 *et seq*
[2] The following companies are members of the Hydrogen Fluoride Panel: Arkema, Inc.; Daikin America, Inc.; DuPont; Honeywell; Mexichem Fluor Sa. de CV.; and Solvay Fluorides.

HF is essential to everyday life. In many cases, HF is the only known raw material that can provide the chemistry which is needed in many applications relevant to quality of life. It is the source for producing fluorine-containing materials such as refrigerant gases for industrial and mobile air conditioning units, blowing agents for insulating foam, fluoropolymers, pharmaceutical and agricultural chemicals. Additional uses include the production of alkylate (octane) for gasoline, stainless steel pickling, semi-conductor preparation, uranium refining, and glass etching.

As responsible product stewards, members of the HF Panel are aware that many factors and site specific characteristics should be considered when evaluating the use of HF. These include risks, hazards, processes, staff resources, feasibility, location, transportation issues and surrounding population among others. As mentioned in the overall comments of the American Chemistry Council, the use of alternative chemicals will depend on many of these site-specific factors. A broad, generalized study on one or more chemical processes would have little practical value for decisions regarding individual facilities. Additionally, study recommendations made without addressing site specific factors and characteristics may actually increase risk to individual facilities.

The Panel appreciates the opportunity to submit these comments. If you require additional information or have questions concerning these comments, please contact me at (703) 741-5614, or by e-mail at Kristy_morrison@americanchemistry.com

Sincerely yours,

Kristy L. Morrison

Kristy L. Morrison, Manager
Hydrogen Fluoride Panel
Chemical Products & Technology Division

SIERRA CLUB
FOUNDED 1892
Lone Star Chapter

May 10, 2010

Chemical Safety and Hazard Investigation Board
Office of Congressional, Public, and Board Affairs
Attn: Dr. Daniel Horowitz
2175 K Street, NW., Suite 650
Washington, DC 20037
Via electronic comments: <*nascomments@csb.gov*>

Re: Comments to CSB–10–01 on CSB funding for a Study by the National Academy of Sciences to examine the use and storage of methyl isocyanate

Attention Chairman John S. Bresland:

The proposed study by the National Academy of Sciences (NAS) to examine the use and storage of methyl isocyanate needs to be expanded to include an evaluation of inherently safer technology alternatives to the deadly catalytic chemical hydrogen fluoride (HF) that is still being widely used in the U.S. oil refining sector in the alkylation units to produce high octane gasoline products. The catalyst HF may pose an even greater hazard to American communities than the use of methyl isocyanate.

The lives of millions of people are at risk who are living in downwind kill zones near local refineries and populated downwind neighborhoods several miles away, since so many large oil refineries continue to use the deadly catalyst HF. Recent accidents at refineries (Citgo's East Corpus Christi refinery on July 19, 2009) in the last two years where HF was released and workers injured highlight the critical need for the Chemical Safety and Hazard Investigation Board to add HF to the upcoming NAS study.

The expanded NAS study is needed because of serious risk concerns about the potential for an airborne release of the HF chemical, which is highly toxic by inhalation and could adversely impact the health and safety of workers and the public in 51 refinery communities located in 20 states. These HF refineries are located in several large urban areas like Los Angeles, Houston, Chicago, Philadelphia, Salt Lake City, Corpus Christi, and others.

At least 51 U.S. oil refineries or about 1/3 of existing refineries are still using the deadly catalyst hydrofluoric acid or HF.

List below has been compiled from the U.S. EPA's 2007 TRI data where HF is reported by oil refineries, and one plant was added, the Citgo Oil's Corpus Christi East refinery,

since it does not file HF release reports most years with the U.S. EPA.

Company Facility - Plant - County or Parish or County Equivalent - State

1. EXXONMOBIL OIL CORP - TORRANCE REFINERY, LOS ANGELES, CA.
2. ULTRAMAR INC. WILMINGTON REFINERY, LOS ANGELES, CA.
3. EXXONMOBIL OIL CORP JOLIET REFINERY, WILL, IL.
4. PDV MIDWEST REFINING L.L.C. LEMONT REFINERY, WILL, IL.
5. MARATHON ASHLAND PETROLEUM LLC, ILLINOIS REFINING DIV, CRAWFORD, IL.
6. COUNTRYMARK REFINERY, POSEY, IN.
7. FRONTIER EL DORADO REFINING CO, BUTLER, KS.
8. COFFEYVILLE RESOURCES REFINING & MARKETING, MONTGOMERY, KS.
9. NATIONAL CO-OP REFINERY ASSOC., MCPHERSON, KS.
10. CATLETTSBURG REFINING LLC, BOYD, KY.
11. MURPHY OIL USA INC MERAUX REFINERY, ST BERNARD, LA.
12. MARATHON PETROLEUM CORP, GARYVILLE, ST JOHN THE BAPTIST, LA.
13. PLACID REFINING CO L.L.C., WEST BATON ROUGE, LA.
14. CHALMETTE REFINING LLC, ST BERNARD, LA.
15. CONOCOPHILLIPS CO - ALLIANCE REFINERY, PLAQUEMINES, LA.
16. MARATHON PETROLEUM CO LLC SAINT PAUL PARK REFINERY, WASHINGTON, MN.
17. EXXONMOBIL BILLINGS REFINERY, YELLOWSTONE, MT.
18. CHS INC. LAUREL REFINERY, YELLOWSTONE, MT.
19. CONOCOPHILLIPS CO BILLINGS REFINERY, YELLOWSTONE, MT.
20. MONTANA REFINING CO INC., CASCADE, MT.
21. TESORO REFINING & MARKETING CO - MANDAN REFINERY, MORTON, ND.
22. VALERO REFINING CO - NEW JERSEY, GLOUCESTER, NJ.
23. NAVAJO REFINING CO, EDDY, NM.
24. WESTERN REFINING SOUTHWEST INC - GALLUP REFINERY, MCKINLEY, NM.
25. MARATHON PETROLEUM CO LLC OHIO REFINING DIV, STARK, OH.
26. CONOCOPHILLIPS PONCA CITY REFINERY, KAY, OK.
27. VALERO REFINING CO - OKLAHOMA VALERO, ARDMORE REFINERY, CARTER, OK.
28. WYNNEWOOD REFINING CO, GARVIN, OK.
29. SUNOCO, INC. (R&M) PHILADELPHIA REFINERY, PHILADELPHIA, PA.
30. CONOCOPHILLIPS CO. - TRAINER REFINERY, DELAWARE, PA.
31. VALERO REFINING CO TENNESSEE LLC, SHELBY, TN.
32. CONOCOPHILLLIPS CO BORGER REFINERY, HUTCHINSON, TX.
33. VALERO THREE RIVERS REFINERY, LIVE OAK, TX.
34. BP PRODUCTS NORTH AMERICA INC, TEXAS CITY REFINERY, GALVESTON, TX.
35. VALERO REFINING - TEXAS L.P., GALVESTON, TX.

36. VALERO REFINING - TEXAS LP, CORPUS CHRISTI WEST PLANT, NUECES, TX.
37. FLINT HILLS RESOURCES LP - WEST PLANT, NUECES, TX
38. PASADENA REFINING SYSTEM,INC, HARRIS, TX.
39. ALON USA - BIG SPRING REFINERY, HOWARD, TX.
40. MARATHON PETROLEUM CO LLC, GALVESTON, TX.
41. VALERO REFINING TEXAS LP CORPUS CHRISTI EAST PLANT, NUECES, TX.
42. CONOCOPHILLIPS CO, SWEENY REFINERY COMPLEX, BRAZORIA, TX.
43. PREMCOR REFINING GROUP INC PORT ARTHUR, JEFFERSON, TX.
44. CITGO, CORPUS CHRISTI EAST REFINERY, NUECES, TX.
45. CHEVRON PRODUCTS CO, SALT LAKE REFINERY, SALT LAKE, UT.
46. BIG WEST OIL LLC, DAVIS, UT.
47. HOLLY REFINING & MARKETING CO, WOODS CROSS REFINERY, DAVIS, UT.
48. CONOCOPHILLIPS, FERNDALE REFINERY, WHATCOM, WA.
49. MURPHY OIL USA INC, DOUGLAS, WI.
50. WYOMING REFINING CO, WESTON, WY.
51. FRONTIER REFINING, CHEYENNE REFINERY, LARAMIE, WY.

States with oil refineries using HF include the following twenty states with 51major oil refineries.

13 - TEXAS
5 - LOUISIANA
4 - MONTANA
3 - UTAH
3 - OKLAHOMA
3 - ILLINOIS
3 - KANSAS
2 - WYOMING
2 - CALIFORNIA
2 - NEW MEXICO
2 - PENNSYLVANIA
1 - INDIANA
1 - KENTUCKY
1 - NEW JERSEY
1 - MINNESOTA
1 - OHIO
1 - NORTH DAKOTA
1 - WASHINGTON
1 - WISCONSIN
1 - TENNESSEE

Please consider expanding and adding the deadly catalytic chemical hydrogen fluoride to the proposed study by the National Academy of Sciences to examine the use and storage of methyl isocyanate. The NAS study needs to include an evaluation of safer alternatives to the deadly catalytic chemical hydrogen fluoride that is widely used in the U.S. oil refining sector in urban areas where millions of people live.

Sincerely yours,

Neil J. Carman, Ph.D.
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