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***"Of all the various remaining civilian vulnerabilities in America today, one stands alone as uniquely deadly, pervasive and susceptible to terrorist attack: toxic- inhalation-hazard industrial chemicals... To date the federal government has made no material reduction in the inherent vulnerability of hazardous chemical targets inside the United States."*** ---

Richard Falkenrath, former Deputy Homeland Security Adviser to President Bush

***"If there are enough terrorists who are dedicated enough and equipped well enough, they're going to overwhelm everything that you put up short of some sort of Fort Knox -- which doesn't make much sense, given the cost and the relatively remote possibility that any specific site is going to be targeted."*** --- Representative Joe Barton (R-TX), chairman of the House Energy and Commerce Committee

### **SAFER TECHNOLOGY: THE ONLY SOLUTION WHEN SECURITY FAILS**

Four years after September 11<sup>th</sup>, sobering warnings have gone unheeded regarding the vulnerability of U.S. chemical plants. Journalists across the country have repeatedly demonstrated the ease with which fence-line security can be penetrated as they have made their way into more than 80 chemical plants.

The potential for loss of life and economic disruption from an attack on one of these plants is staggering. A 2001 U.S. Army Surgeon General study estimated that 900,000 to 2.4 million people could be killed or injured in a terrorist attack on a U.S. chemical plant in a densely populated area. According to the Environmental Protection Agency (EPA), at least 100 chemical plants threaten a million or more people. Chlorine gas is the most common industrial chemical hazards at the 100 highest risk plants. According to the Chlorine Institute, a chlorine gas cloud can drift through a city and remain dangerous for at least 14 miles.

While high-tech security cannot ensure against a successful terrorist attack at a chemical plant, hundreds of communities have already secured their home towns by neutralizing the chemical hazards at local chemical plants. The New York Times reported in April that, ***"225 industrial plants in this country have switched to using less dangerous chemicals since the 2001 terrorist attacks, lowering the risk that people nearby would be injured or killed by toxic plumes..."***

The Department of Homeland Security (DHS) has now identified 3,400 high priority chemical facilities in the U.S. which put more than 1,000 people at risk. Of these DHS estimates that 272 facilities each put more than 50,000 people at risk.

Clearly these are priority facilities. The day after a catastrophic attack no one will argue that we should NOT require the elimination or reduction of these hazards where cost-effective alternatives exist. These alternatives include a wide range of options such as process changes, chemical substitutions, smaller storage facilities or any other measures that will reduce or eliminate the inherent hazard posed by the facility's storage, use or production of an ultra-hazardous substance. This range of options is a far from "dictating" a specific technology as has been claimed by some opponents.

The largest category of inherently dangerous substances is toxic-by-inhalation (TIH) gases. According to the EPA just **four TIH gases account for 55 percent** of all categories of processes that threaten communities nationwide. They are:

**anhydrous ammonia --- 32.5% (8,343 processes)**  
**chlorine --- 18.3% (4,682 processes)**  
**sulfur dioxide --- 3% (768 processes)**  
**hydrogen fluoride --- 1.2% (315 processes)**

These chemical processes deserve high priority because of their prevalent use at thousands of facilities, especially at high threat facilities. Fortunately, there are also widely available safer alternatives for each of them. For example, 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.

Examples of conversions from these chemicals and continuing threats include:

\*\*\* More than 200 water treatment facilities (including Washington, D.C.) converted to safer alternatives such as ultraviolet light, eliminating the use of **chlorine** and **sulfur dioxide** gas. But over 100 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.

While the CAP analysis proves the technological 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.

Conversion costs can be amortized over time, The CAP analysis shows that 87% of the converted facilities spent less than \$1 million and half spent less than \$100,000. 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 which can significantly impact the financial health of a facility or company.

The use of safer technologies offers a more stable business plan with much fewer regulations, potentially zero liability, sustainable profitability and better relationships with workers and neighboring communities and no threat of a catastrophic attack or accident. Requiring safer technologies simply establishes a level playing field that will allow proven cost-effective systems to grow profitably while providing communities safety and security.

Legislation that fails to utilize proven and available safer technologies and instead relies solely on flawed fence-line security will continue to put millions of lives at unnecessary risk.

Expert Opinions:

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 that ***"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 2005 Government Accountability Office report (GAO-05-165) identifies 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 uses the highest priority for federal funding. The report also identifies using smaller containers for shipping and storing chlorine, such as 1-ton cylinders.

A May 2006 report by the National Academy of Sciences, "Terrorism and the Chemical Infrastructure: Protecting people and Reducing Vulnerabilities," recommended more research on new technologies but stated, ***"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."***

***"Railroads agree, and strongly support efforts aimed at finding and utilizing 'inherently safer technologies' as substitutes for hazardous materials, especially TIH."*** -- Association of American Railroads (AAR) President, and CEO Edward R. Hamberger in testimony before the House Transportation and Infrastructure Committee's Railroad Subcommittee.

Retired Rohm and Haas engineer, Dennis Hendershot advised, ***"The first solution to a process safety problem should always be to get rid of the hazard, not control it."*** Trever Kletz, formerly with Imperial Chemical Industries (ICI) says, ***"The very best way to prevent an explosion is to simply replace the material that explodes with one that does not or at least keep the stock down so low that it hardly matters if it all leaks out."***

A multi-stakeholder EPA advisory group, the Water Security Working Group of the National Drinking Water Advisory Committee, stated in consensus findings (May 18, 2005) that, ***"inherently safer practices or practices that have a lower risk potential also have potential to enhance security."***