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HOMELAND SECURITY

Federal and Industry Efforts Are Addressing Security Issues at Chemical Facilities, but Additional Action Is Needed

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Highlights of [GAO-05-631T](#), testimony before the Committee on Homeland Security and Governmental Affairs, U. S. Senate

Why GAO Did This Study

Terrorist attacks on chemical facilities could severely damage the U.S. economy and public health. About 15,000 facilities produce, use, or store large amounts of chemicals that pose the greatest risk to human health and the environment. While the Environmental Protection Agency (EPA) formerly had the lead role in federal efforts to ensure chemical facility security, the Department of Homeland Security (DHS) is now the lead federal agency responsible for coordinating government and private efforts to protect these facilities from terrorist attacks.

This testimony is based on GAO's past work on chemical facility security and focuses on (1) the attractiveness of chemical facilities as terrorist targets, (2) their diversity and risks, (3) federal security requirements for these facilities, and (4) federal and industry efforts to improve facility security.

What GAO Recommends

In March 2003, GAO recommended that DHS and EPA develop (1) a comprehensive chemical security strategy and (2) a legislative proposal to require facilities to assess their vulnerability to attacks and require corrective action. At that time, DHS and EPA generally agreed with these recommendations and, while EPA no longer has a key role in ensuring chemical facility security, DHS is taking steps to implement them.

www.gao.gov/cgi-bin/getrpt?GAO-05-631T.

To view the full product, including the scope and methodology, click on the link above. For more information, contact John Stephenson at (202) 512-3841 or stephensonj@gao.gov.

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What GAO Found

Experts agree that the nation's chemical facilities are attractive targets for terrorists. The theft or release of certain chemicals could disrupt the local economy, impact other critical infrastructures that rely on chemicals, or impact the health and safety of millions of Americans. For example, a 2002 Brookings Institution report ranks an attack on toxic chemical plants behind only biological and atomic attacks in terms of possible fatalities. While several efforts are underway, no one has yet comprehensively assessed security at the nation's chemical facilities.

The chemical sector includes a variety of facilities and risks. The 15,000 facilities with large amounts of the most dangerous chemicals include chemical manufacturers, water supply facilities, and fertilizer facilities, among others. Some facilities may be at higher risk of a terrorist attack than others because of the specific chemicals on site and their proximity to population centers. According to 2003 EPA data, 123 U.S. chemical facilities had "worst-case" scenarios where more than one million people could be at risk of exposure to a cloud of toxic gas. While EPA and DHS believe that these scenarios overstate the potential consequences of a chemical release, there are situations where an attack could have potentially more severe consequences.

Only about one-sixth of the 15,000 facilities with large amounts of dangerous chemicals are covered by federal security requirements. About 2,000 community water systems and 238 facilities that are located on waterways and handle "bulk liquid chemicals" must conduct vulnerability assessments, among other things, under the Public Health Security and Bioterrorism Response Act of 2002 and the Maritime Transportation Security Act of 2002, respectively. However, the federal government places requirements on chemical facilities to address accidental releases, which may also reduce the likelihood and mitigate the consequences of terrorist attacks.

A number of federal and industry efforts are underway to enhance chemical facility security. DHS is developing a strategy to protect the chemical sector, identify high-risk facilities, and integrate chemical sector protection efforts into a national program. With no authority to require facilities to improve security, DHS has provided the industry with financial assistance, information, and training, assessed facility vulnerability, and recommended security improvements. About 1,100 facilities participate in a voluntary industry effort in which they assess vulnerabilities, develop security plans, and undergo a third party verification that the facilities implemented the identified physical security enhancements. The extent to which the remaining facilities are addressing security is unclear and the extent of chemical facilities' security preparedness is unknown. In this context, a comprehensive national strategy to identify high-risk facilities and require facilities to assess their vulnerabilities, among other actions, would help to ensure that security vulnerabilities at chemical facilities are addressed.

Madame Chairman and Members of the Committee:

Thank you for this opportunity to discuss our work on chemical facility security.¹ As the events of September 11, 2001, showed, a terrorist attack on infrastructure that is critical to our nation's economy can cause enormous damage to our country and jeopardize public health and safety. The USA PATRIOT Act defined critical infrastructure as those "systems and assets...so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters."² We often take these systems for granted because they are so basic in our daily lives that we generally only notice them when their service is interrupted. The President's February 2003 National Strategy for the Physical Protection of Critical Infrastructures and Key Assets sets forth the federal government's goals, objectives, and responsibilities in protecting the nation's critical infrastructure. The strategy, as well as a presidential directive issued in December 2003, identified the chemical industry among the sectors that are critical to the nation's infrastructure.³ The chemical sector produces, uses, stores, and distributes the chemicals needed to manufacture thousands of products, such as those used in agriculture, pharmaceuticals, and automobiles.

The national strategy states that the private sector bears primary responsibility for protecting their facilities from deliberate acts of terrorism. While federal, state, and local governments work in partnership with the private sector to protect chemical facilities, before September 11, 2001, attention was largely focused on the risks of accidental, rather than intentional, chemical releases. In this regard, the Environmental Protection Agency (EPA) regulates about 15,000 facilities under the Clean Air Act because they produce, use, or store more than certain threshold amounts of specific chemicals that would pose the greatest risk to human health and the environment if accidentally released into the air. These

¹GAO, *Homeland Security: Voluntary Initiatives Are Under Way at Chemical Facilities, but the Extent of Security Preparedness is Unknown*, [GAO-03-439](#) (Washington, D.C.: March 2003) and *Protection of Chemical and Water Infrastructure: Federal Requirements, Actions of Selected Facilities, and Remaining Challenges*, [GAO-05-327](#) (Washington, D.C.: March 2005).

²Pub. L. No. 107-56, § 1016(e) (2001) (codified at 42 U.S.C. § 5195c(e)).

³Homeland Security Presidential Directive Number 7 (Washington, D.C.: December 17, 2003).

facilities must take a number of steps, including preparing a risk management plan (RMP), to prevent and prepare for an accidental release and, therefore, are referred to as “RMP” facilities. While EPA initially had the lead responsibility for protecting the chemical infrastructure sector, the Department of Homeland Security (DHS) is now the lead federal agency. DHS is responsible for coordinating the efforts of government and private institutions to protect critical infrastructure, including the chemical sector, from terrorist attacks.

My remarks today are based on our March 2003 and March 2005 reports, and will focus on (1) experts’ views on the attractiveness of chemical facilities as terrorist targets, (2) the diversity of these facilities and their risks, (3) federal requirements that address security at these facilities, and (4) an overview of steps the federal government and industry have taken to improve facility security. For this work, we interviewed officials from EPA, DHS, and the Department of Justice; reviewed pertinent federal legislation, EPA data, and available reports; and interviewed industry representatives from the American Chemistry Council, other industry associations, and a number of chemical companies. We conducted our work according to generally accepted government auditing standards. We are currently reviewing ongoing federal and industry efforts to improve chemical facility security, including the need for further regulation. We plan to issue a report on our findings later this year.

Summary

In summary, we found the following:

- Experts agree that the nation’s chemical facilities present an attractive target for terrorists intent on causing massive damage. For example, the Department of Justice has concluded that the risk of an attempt in the foreseeable future to cause an industrial chemical release is both real and credible. Terrorist attacks involving the theft or release of certain chemicals could significantly impact the health and safety of millions of Americans, disrupt the local or regional economy, or impact other critical infrastructures that rely on chemicals, such as drinking water and wastewater treatment systems. Despite efforts by DHS to assess facility vulnerabilities and suggest security improvements, no one has comprehensively assessed security at facilities that house chemicals nationwide.
- DHS has not yet determined the number and type of facilities that should be considered as part of the chemical infrastructure sector. The universe of facilities with chemicals is diverse, and they present a variety of risks.

About 15,000 RMP facilities produce, use, or store more than threshold amounts of chemicals that EPA has estimated pose the greatest risk to human health and the environment if they were accidentally released into the air. RMP facilities include chemical manufacturers, water supply and wastewater treatment facilities, agricultural suppliers such as fertilizer facilities, food storage facilities, pulp and paper manufacturers, and iron and steel mills, among others. Some facilities may be at higher risk of a terrorist attack than others because of the chemicals they house and their proximity to population centers. According to 2003 EPA data, the toxic “worst-case” scenarios for 123 chemical facilities stated that more than one million people could be at risk of exposure to a cloud of toxic gas. About 600 facilities could each potentially threaten between 100,000 and a million people and about 2,300 facilities could each potentially threaten anywhere from 10,000 to 100,000 people. According to EPA and DHS, the method for calculating these scenarios overstates the potential consequences of a chemical release. However, because the scenarios estimate the effects of an accidental toxic chemical release involving the greatest amount of the toxic chemical held in a single vessel or pipe, not the entire quantity on site, an attack that breached multiple chemical vessels simultaneously could result in a larger release with potentially more severe consequences than those outlined in “worst-case” scenarios.

- Currently, no federal requirements comprehensively address security at all U.S. chemical facilities. Only about one-sixth of the 15,000 RMP facilities must comply with federal security requirements related to terrorism. Approximately 2,000 RMP facilities are community water systems subject to the Public Health Security and Bioterrorism Response Act of 2002 and therefore must conduct vulnerability analyses of their facilities, among other things. According to the Coast Guard, 238 chemical facilities that are located on waterways and handle “bulk liquid chemicals” must assess the vulnerabilities of certain facilities and develop and implement security plans under the Maritime Transportation Security Act of 2002 and its implementing regulations. The remaining chemical facilities are not subject to such security requirements. Although the federal government does not require all chemical facilities to adopt security measures against acts of terrorism, it does impose safety and emergency response requirements on chemical facilities to address accidental releases. These requirements may incidentally reduce the likelihood and mitigate the consequences of terrorist attacks.
- The federal government and the chemical industry have taken a number of steps to enhance security at chemical facilities but further action is needed. DHS’ Information Analysis and Infrastructure Protection Directorate is developing a strategy for protecting the chemical sector,

identifying high-risk facilities, and integrating chemical sector protection efforts into a national program. Without specific authority to require chemical facilities to improve security, DHS has worked with the chemical industry by providing financial assistance, sharing information about critical infrastructure protection, assessing facility vulnerabilities, recommending security improvements, and providing training. In addition, the chemical industry, led by its industry associations, is conducting voluntary initiatives at member facilities. The primary industry security initiative, the American Chemistry Council's Responsible Care Management System®, directs participating facilities to assess vulnerabilities, develop security plans, and undergo a third party verification that the facilities implemented the identified physical security enhancements. These third parties are not required, however, to verify that the vulnerability assessment is appropriately conducted and that the actions taken by the facility adequately address security risks. Nevertheless, ACC's self-initiated requirements incorporate elements of a risk management framework and were designed to strengthen security at its members' facilities. Approximately 1,100 (or 7 percent) of the 15,000 RMP facilities are members of ACC and the Synthetic Organic Chemical Manufacturers Association—which represents manufacturers who produce specialty-chemicals at small- to medium-sized facilities—and, thus, are to comply with the Responsible Care® security requirements. However, the extent to which the remaining 14,000 RMP facilities, or other chemical facilities that are not RMP facilities, may be voluntarily addressing their security is unclear. Consequently, despite government and industry efforts, the extent of security preparedness at chemical facilities is unknown.

To ensure that chemical facilities take action to review and address security vulnerabilities, we recommended in March 2003, that the Secretary of Homeland Security and the Administrator of EPA jointly develop a comprehensive national strategy for chemical security that is both practical and cost effective. The strategy should, among other things, identify high-risk facilities and collect information on industry security preparedness. We also recommended that DHS and EPA develop a legislative proposal, in consultation with industry and other appropriate groups, to require these chemical facilities to expeditiously assess their vulnerability to terrorist attacks and, where necessary, require these facilities to take corrective action. At that time, DHS and EPA generally agreed with these recommendations.

While EPA no longer has a key role in ensuring chemical facility security, DHS has taken steps to implement our recommendations. In February 2005, DHS released its Interim National Infrastructure Protection Plan.

While we have not fully evaluated this plan, it outlines a risk management framework to guide future efforts to identify and protect critical infrastructure and defines the roles of federal, state, local, and tribal agencies and the private sector using elements of this framework. In addition, DHS is developing a strategic plan specifically for securing the chemical sector and has a number of efforts underway to help identify and mitigate chemical facilities' vulnerabilities. We are evaluating DHS' efforts and plans for improving chemical sector security in our ongoing review.

In comments responding to our March 2003 report, DHS stated that voluntary efforts alone will not be sufficient to assure an appropriate level of security across the industry, and that, in the department's view, every one of the approximately 15,000 RMP facilities nationwide should be required to perform comprehensive vulnerability assessments and take actions to reduce vulnerabilities. As part of our ongoing review for this Committee, we plan to obtain DHS' current views on whether legislation is still necessary and, if so, the types of provisions the agency feels would best assist the nation's chemical facilities in addressing their vulnerability to attack.

Background

The Homeland Security Act of 2002 established DHS and set forth its mission to, among other things, prevent terrorist attacks within the United States, reduce the vulnerability of the United States to terrorism, and minimize the damage and assist in the recovery from terrorist attacks that do occur within the United States. Following passage of the act, a December 2003 presidential directive states that DHS is responsible for coordinating the overall national effort to enhance the protection of the critical infrastructure and key resources of the United States. The Secretary of Homeland Security serves as the principal federal official to lead, integrate, and coordinate the implementation of efforts among federal departments and agencies, state and local governments, and the private sector to protect critical infrastructure and key resources. The directive identified the chemical sector as a critical infrastructure sector along with other sectors, including agriculture, banking and finance, defense industrial base, emergency services, energy, food, government, information and telecommunications, postal and shipping, public health, transportation, and water. Under this presidential directive, DHS is now the lead agency for the chemical infrastructure sector, a change from national strategies issued in July 2002 and February 2003, which named EPA as the lead federal agency.

The presidential directive emphasized those critical infrastructure and key resources that could be exploited to cause catastrophic health effects or mass casualties. Because many chemicals are inherently hazardous, the release of chemicals or the risk of contamination at chemical facilities poses a potential threat to public health and the economy. Under the Clean Air Act's Risk Management Program provisions, EPA identified 140 toxic and flammable chemicals that, when present above certain threshold amounts, would pose the greatest risk to human health and the environment if released accidentally into the air. According to EPA, approximately 15,000 facilities in a variety of industries produce, use, or store one or more of these chemicals beyond threshold amounts in one or more processes (e.g., single or interconnected vessels or tanks).

Before these functions were transferred to DHS by the Homeland Security Act of 2002, Justice was responsible for collecting information from the U.S. intelligence community, the FBI's criminal investigations, other federal agencies, and the private sector about threats, including those involving chemicals. The Chemical Safety Information, Site Security and Fuels Regulatory Relief Act required Justice to review the vulnerability of chemical facilities to terrorist or criminal attack and report this information to the Congress.⁴ Justice prepared and submitted an interim report to Congress in May 2002 based on observations made at 11 chemical manufacturing facilities.

Experts Agree that Chemical Facilities Are an Attractive Target for Terrorists

Experts agree that the nation's chemical facilities present an attractive target for terrorists intent on causing massive damage. Many facilities house toxic chemicals that could become airborne and drift to surrounding communities if released or could be stolen and used to create a weapon capable of causing harm. Justice has been warning of the terrorist threat to chemical facilities for a number of years and has concluded that the risk of an attempt in the foreseeable future to cause an industrial chemical release is both real and credible. Based on analysis of trends in international and domestic terrorism and the burgeoning interest in weapons of mass destruction among criminals and terrorists, Justice warned of potential targeting by terrorists of chemical facilities before the events of September 11, 2001. In fact, according to Justice, domestic terrorists plotted to use a destructive device against a U.S. facility that housed millions of gallons of propane in the late 1990s. In testimony on

⁴Pub. L. No. 106-40, 113 Stat. 207 (1999).

February 6, 2002, the Director of the Central Intelligence Agency also warned of the potential for an attack by al Qaeda on chemical facilities.

Terrorist attacks involving the theft or release of certain chemicals could have a significant impact on the health and safety of millions of Americans. The disaster at Bhopal, India in 1984, when methyl isocyanate gas—a highly toxic chemical—leaked from a tank, reportedly killing about 3,800 people and injuring anywhere from 150,000 to 600,000 others, illustrates the potential threat to public health from a chemical release. While U.S. chemical facilities are subject to a number of safety requirements, the Army has estimated high potential damage to the U.S. population from an intentional toxic chemical release. During a 2001 informal meeting with a number of agencies, the Army Office of the Surgeon General proposed, based on generic estimates, that it was conceivable that as many as 2.4 million people could request medical treatment if a terrorist caused the release of a toxic chemical.⁵ According to officials from that office, these estimates include anyone who seeks medical attention as a result of the release—including people with minor irritations or concerns. Similarly, a 2002 Brookings Institution report ranks an attack on toxic chemical plants behind only biological and atomic attacks in terms of possible fatalities.⁶ In January 2005 testimony before the Senate Committee on Homeland Security and Governmental Affairs on challenges facing DHS, a Brookings Institution Visiting Fellow identified chemical facility security as a priority for DHS, noting that toxic industrial chemicals present the potential for mass casualties from a terrorist attack that is rivaled only by improvised nuclear devices, certain acts of bioterrorism, and the collapse of large, occupied buildings.⁷

In addition to the potential loss of life, a terrorist attack on a chemical facility could also disrupt the local or regional economy or impact other critical infrastructures. The chemical manufacturing industry produces the chemicals used in agriculture, pharmaceuticals, drinking water and

⁵U.S. Army, *Draft Medical NBC Hazard Analysis of Chemical-Biological-Radiological-Nuclear-High Explosive Threat, Possible Scenarios & Planning Requirements*, Army Office of the Surgeon General (October 2001).

⁶The Brookings Institution, *Protecting the American Homeland: A Preliminary Analysis*, (Washington, D.C.: 2002).

⁷Statement of Richard A. Falkenrath, Visiting Fellow, The Brookings Institution, before the United States Senate Committee on Homeland Security and Governmental Affairs (January 26, 2005).

wastewater treatment systems, and food processing. DHS' February 2005 Interim National Infrastructure Protection Plan notes that many critical infrastructure assets are dependent on multiple elements and systems to remain functional. In some cases, a failure in one sector will have a significant impact on the ability of another sector to perform necessary functions. For example, rail transportation of many hazardous materials including chlorine was disrupted in some states following the events of September 11, 2001, because of concern about the potential for an intentional chemical release. This disruption to rail service impacted drinking water facilities that relied on chlorine delivered by rail to purify water.

Currently, no one has comprehensively assessed security across the nation at facilities that house chemicals. Both EPA and DHS officials have visited some chemical facilities to discuss security since September 11, 2001, but the results of these visits are not publicly available. EPA visited 30 high-risk chemical facilities to discuss security, and DHS has visited a number of chemical facilities to assist owner/operators in assessing vulnerabilities at their facilities. During a limited review of chemical industry vulnerabilities conducted at 11 facilities primarily before September 11, 2001, Justice found that some chemical facilities may need to implement more effective security systems and develop alternative means to reduce the potential consequences of a successful attack. The effectiveness of security at some facilities may also be in doubt as evidenced by several media accounts of reporters and environmental activists gaining access to chemical tanks and computer centers that control manufacturing processes at facilities in 2001, 2002, and 2003.

Chemical Infrastructure Sector Includes Many Types of Facilities with Different Risks

DHS has not yet determined the number and type of facilities that should be considered as part of the chemical infrastructure sector. The universe of chemical facilities is diverse in that they produce, use or store a host of products, including (1) basic chemicals used to manufacture other products such as fertilizers, plastics, and synthetic fibers; (2) specialty chemicals used for a specific purpose such as a functional ingredient or a processing aid in the manufacture of a range of products such as adhesives and solvents, coatings, industrial gases and cleaners, and water management chemicals; (3) life science chemicals consisting of pharmaceuticals and pesticides; and (4) consumer products such as hair and skin products and cosmetics. In total, about 15,000 RMP facilities produce, use, or store more than threshold amounts of one or more of the 140 toxic and flammable chemicals that EPA has estimated pose the greatest risk to human health and the environment if accidentally released

into the air. Approximately 4,000 facilities manufacture these chemicals, and numerous other types of facilities—agricultural suppliers such as fertilizer facilities, food storage facilities, pulp and paper manufacturers, iron and steel mills, and computer manufacturing facilities—also house large quantities of chemicals. While the universe of chemical facilities is diverse, some of these facilities are part of other critical infrastructure sectors. For example, about 2,000 of these facilities are community water systems that are part of the water infrastructure sector.

Some facilities may be at higher risk of a terrorist attack than others because of the chemicals they house and their proximity to population centers. Toxic chemicals such as chlorine and ammonia could form a toxic cloud and drift over neighboring populations if released, while flammable chemicals such as butane and hydrogen could be used in destructive devices. Assuming that the objective of an attack is a catastrophic release of a toxic chemical, attacks on such facilities could harm a large number of people with health effects ranging from mild irritation to death. No specific data are available on what the actual effects of successful terrorist attacks on chemical facilities would be. However, RMP facilities submit to EPA estimates of the potential consequences to surrounding communities of hypothetical “worst-case” accidental chemical releases from their facilities. These estimates include the residential population located within the range of a toxic gas cloud produced by a “worst-case” chemical release, called the “vulnerable zone.” According to 2003 EPA data, 123 chemical facilities located throughout the nation had toxic “worst-case” scenarios where more than one million people would be in the “vulnerable zone” and could be at risk of exposure to a cloud of toxic gas.⁸ About 600 facilities could each potentially threaten between 100,000 and a million people, and about 2,300 facilities could each potentially threaten between 10,000 and 100,000 people within these facilities’ “vulnerable zones.”

⁸“Vulnerable zones” are determined by drawing a circle around a facility with the radius of the circle equal to the distance a toxic gas cloud would travel before dissipating to relatively harmless levels. Because, in an actual event, the toxic cloud would only cover a fraction of that circle, it is unlikely that the event would actually result in exposure of the entire population estimated in the “worst-case” scenario, according to EPA. The number of persons within a “vulnerable zone” is larger than the number of persons that would be affected by a “worst-case” scenario. In addition, EPA’s requirements for “worst-case” release analysis tend to result in consequence estimates that are significantly higher than what is likely to actually occur. For example, “worst-case” release analysis does not take into account active mitigation measures facilities often employ to reduce the consequences of releases.

According to EPA and DHS, the method for calculating “worst-case” scenario calculations for RMP facilities overstates the potential consequences of a chemical release. The scenarios do not consider the potential causes of a release or how different causes or other circumstances, such as safety features, could lessen the consequences of a release. Furthermore, the scenarios’ “vulnerable zones” include the population in the entire area surrounding the facility, while the wind would typically carry the toxic cloud in one direction affecting only a portion of the area. While officials believe these scenarios are overstated, there are situations where an attack could result in larger consequences. EPA regulations require RMP facilities to estimate the effects of a toxic chemical release involving the greatest amount of the toxic chemical held in a single vessel or pipe, rather than the entire quantity on site. Therefore, for some facilities, an attack could breach multiple chemical vessels simultaneously and could result in a larger release with potentially more severe consequences than estimated in the “worst-case” scenario.

Few Federal Requirements Address Security at the Nation’s Chemical Facilities

Currently, few federal requirements address security at U.S. chemical facilities. While some chemical facilities must comply with the Public Health Security and Bioterrorism Response Act of 2002 (Bioterrorism Act) and the Maritime Transportation Security Act of 2002 (MTSA), many are not subject to any federal security requirements. The Bioterrorism Act requires community water systems serving more than 3,300 people to perform vulnerability analyses of their facilities, among other things. Many of these facilities may store hazardous chemicals for water treatment and are not required to implement any risk reduction actions based on their vulnerability assessments or report to EPA on measures that have been implemented. EPA estimated in 2003, that approximately 2,000 RMP facilities may be community water systems covered under the Bioterrorism Act. MTSA and its implementing regulations require maritime facility owners and operators to conduct assessments of certain at-risk facilities to identify vulnerabilities, develop security plans to mitigate these vulnerabilities, and implement the measures discussed in the security plans. According to the Coast Guard, 238 chemical facilities are located on waterways and handle “bulk liquid chemicals” are subject to MTSA requirements.

The remaining chemical facilities, including the approximately 13,000 RMP facilities, are subject to no federal requirements specifically related to improving security against terrorist attacks. Although these facilities pose different levels of risk depending on the chemicals they use or store, thousands house quantities of toxic chemicals that could impact

neighboring populations if released. The security requirements for the chemical sector stand in contrast to a number of other critical infrastructure sectors that are subject to federal security requirements. In addition to community water systems, all commercial nuclear power plants licensed by the Nuclear Regulatory Commission are subject to a number of security requirements, including placing physical barriers outside the operating reactor area, limiting access to vital areas, maintaining a trained security force, and conducting simulated terrorist attack exercises.

While the federal government does not require all chemical facilities to take security measures to protect against a terrorist attack, it does impose safety and emergency response requirements on chemical facilities, which may incidentally reduce the likelihood and mitigate the consequences of terrorist attacks. For example, the Emergency Planning and Community Right to Know Act requires owners and operators of facilities that maintain specified quantities of certain extremely hazardous chemicals to annually submit information on their chemical inventory to state and local emergency response officials. This information is used to help prepare community response plans in the event of a chemical incident. Under Section 112(r) of the Clean Air Act, EPA's Risk Management Program requires owners and operators of facilities that handle listed extremely hazardous substances over a threshold amount to prepare and implement a risk management plan to detect and prevent or minimize accidental releases. In addition to evaluating "worst-case" accidental release scenarios, facility owners and operators must implement a program to prevent accidental releases that includes safety precautions and maintenance, monitoring, training measures, and must have an emergency response plan. The Department of Labor's Occupational Safety and Health Administration's process safety management standard also requires facilities to assess and address the hazards of their chemical process. These requirements could potentially mitigate a terrorist attack by (1) providing an incentive to facilities to reduce or eliminate chemicals below regulated threshold levels, (2) requiring facilities to implement measures to improve the safety of areas that are vulnerable to a chemical release, and (3) facilitating emergency response planning that increases preparedness for a chemical release—whether intentional or unintentional.

Federal Government and Industry Have Taken Steps to Improve Facility Security, but Further Action Is Needed

The federal government and the chemical industry have taken a number of steps to enhance security at chemical facilities. DHS' Information Analysis and Infrastructure Protection Directorate has a number of initiatives underway to develop a strategy for protecting the chemical sector, identify high-risk facilities, and integrate chemical sector protection efforts into a national program. In February 2005, DHS released an Interim National Infrastructure Protection Plan. While we have not yet fully evaluated this plan, it outlines a risk management framework to guide future efforts to identify and protect critical infrastructure and defines the roles of federal, state, local, and tribal agencies and the private sector. DHS is also developing a vulnerability and risk assessment methodology designed to assist facilities with analyzing security, help DHS rank these facilities by risk, and allow DHS to compare assets across sectors.⁹

Without specific authority to require that chemical facilities make security improvements, DHS has worked voluntarily with the chemical industry to provide financial assistance, share information about critical infrastructure protection, provide training and exercises, and assess facility vulnerabilities and recommend security improvements. DHS has provided training programs to first responders and facility security officers and held drills at chemical facilities. DHS has also provided advice and guidance to state and local partners to reduce vulnerabilities in buffer zones (the area extending from the facility to the surrounding community) and conducted site assistance visits.

The chemical sector, led by its industry associations, also has voluntary initiatives underway at member facilities. Industry associations have issued security guidance, identified security best practices, and developed vulnerability assessment methodologies specific to their members. In addition, industry is assisting DHS in developing a methodology for assessing risk in the chemical sector. To provide a mechanism for coordinating with DHS, in June 2004, the chemical industry established the Chemical Sector Council to identify, prioritize, and coordinate the protection of the industry's critical infrastructure and key resources, and to facilitate the sharing of information about physical and cyber threats, vulnerabilities, incidents, potential protective measures, and best

⁹DHS is developing this methodology—called the Risk Analysis and Management for Critical Asset Protection (RAMCAP)—in conjunction with the American Society of Mechanical Engineers.

practices. The Council is composed of 16 sector associations representing a range of chemical facilities.¹⁰

The primary security initiative undertaken by the industry directs participating chemical facilities to assess vulnerabilities and develop security plans to address them. In this regard, the American Chemistry Council (ACC)—whose members own or operate approximately 1,000 (or about 7 percent) of the 15,000 RMP facilities—requires its members to perform vulnerability assessments, develop plans to mitigate vulnerabilities, and take actions to implement the plans.¹¹ Companies are then required to have third parties such as local emergency responders or local law enforcement officials verify that physical security enhancements identified in facility plans were implemented. These third parties are not required, however, to verify that the vulnerability assessment is appropriately conducted and that the actions taken by the facility adequately address security risks.

ACC also has a new requirement that independent auditors certify that member companies have management systems in place. These audits will confirm that companies have security programs and processes. According to ACC, all of its members have conducted vulnerability assessments, and most have completed security enhancements and had them verified. The Synthetic Organic Chemical Manufacturers Association (SOCMA), which represents manufacturers who produce specialty chemicals at small- to medium-sized facilities, also adopted these security requirements for all of their member facilities, which include 77 of the 15,000 RMP facilities.¹²

¹⁰As of April 2005, Chemical Sector Council members included the American Chemistry Council, the American Forest and Paper Association, the Chemical Producers and Distributors Association, the Chlorine Chemistry Council, the Compressed Gas Association, CropLife America, the Institute of Makers of Explosives, the International Institute of Ammonia Refrigeration, the National Association of Chemical Distributors, the National Paint and Coatings Association, the National Petrochemical and Refiners Association, the Synthetic Organic Chemical Manufacturers Association, the Adhesive and Sealant Council, the Chlorine Institute, the Fertilizer Institute, and the Society of the Plastics Industry, Inc.

¹¹ACC adopted a security code to accompany its Responsible Care Management System®, a voluntary program to achieve improvements in environmental, health, and safety performance through management practices addressing a range of business activities. Member companies must comply with Responsible Care® requirements as a condition of membership.

¹²SOCMA has 160 member companies. Thirty-six of these companies are also members of ACC and follow the Responsible Care® requirements. The remaining 124 SOCMA member companies operate 273 facilities—of which 77 are RMP facilities.

ACC and SOCMA's self-initiated membership requirements incorporate elements of a risk management framework, which can aid in assessing risk by determining which vulnerabilities should be addressed in what ways within available resources, and were designed to strengthen security at facilities that comply with its requirements. The actions required by Responsible Care® may exceed efforts taken by non-participating facilities.

Despite these efforts, the overall extent of security preparedness at chemical facilities is unknown. While DHS has a number of programs underway to identify high-risk facilities and assess their vulnerabilities, these programs are in their infancy. As a result, neither DHS nor any other federal entity has yet assessed the overall extent of security preparedness at the nation's chemical facilities. While chemical industry associations have worked closely with member companies to evaluate and improve security at facilities, the extent of participation in voluntary initiatives is unclear. EPA officials estimated in 2003, that voluntary initiatives led by industry associations only reach a portion of the 15,000 RMP facilities. Further, EPA and DHS have stated publicly that voluntary efforts alone are not sufficient to assure the public of the industry's preparedness. In this context, a comprehensive national chemical security strategy that would, among other actions, identify high-risk facilities and require facilities to assess their vulnerabilities and take any needed corrective actions would help to ensure that security vulnerabilities at chemical facilities are addressed.

Conclusions

Across the nation, thousands of industrial facilities manufacture, use, or store hazardous chemicals in quantities that could potentially put large numbers of Americans at risk of injury or death in the event of a chemical release. Experts agree that chemical facilities are an attractive target to terrorists because of the potential to harm large numbers of people and disrupt the economy or other critical infrastructures. Yet, despite efforts since September 11, 2001, to protect the nation from terrorism, the extent of security preparedness at U.S. chemical facilities is unknown. While some other critical infrastructures are required to assess their vulnerabilities, no federal requirements are in place to require all chemical facilities to assess their vulnerabilities and take steps to reduce them. Both the federal government and the chemical industry have taken steps to improve security at chemical facilities. However, these efforts have not involved all facilities with significant quantities of hazardous chemicals on site. Further action is needed to ensure that the nation's chemical facilities—which produce, use, and store chemicals vital to the

manufacture of a range of everyday products—are assessing security vulnerabilities and taking actions to address them.

Madame Chairman, this concludes our prepared statement. We would be happy to respond to any questions that you or Members of the Committee may have.

Contacts and Acknowledgments

For further information about this testimony, please contact me at (202) 512-3841. Jill Edelson, Joanna Owusu, Debra B. Sebastian, Amy Webbink, Leigh White, and Vincent P. Price made key contributions to this statement.

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