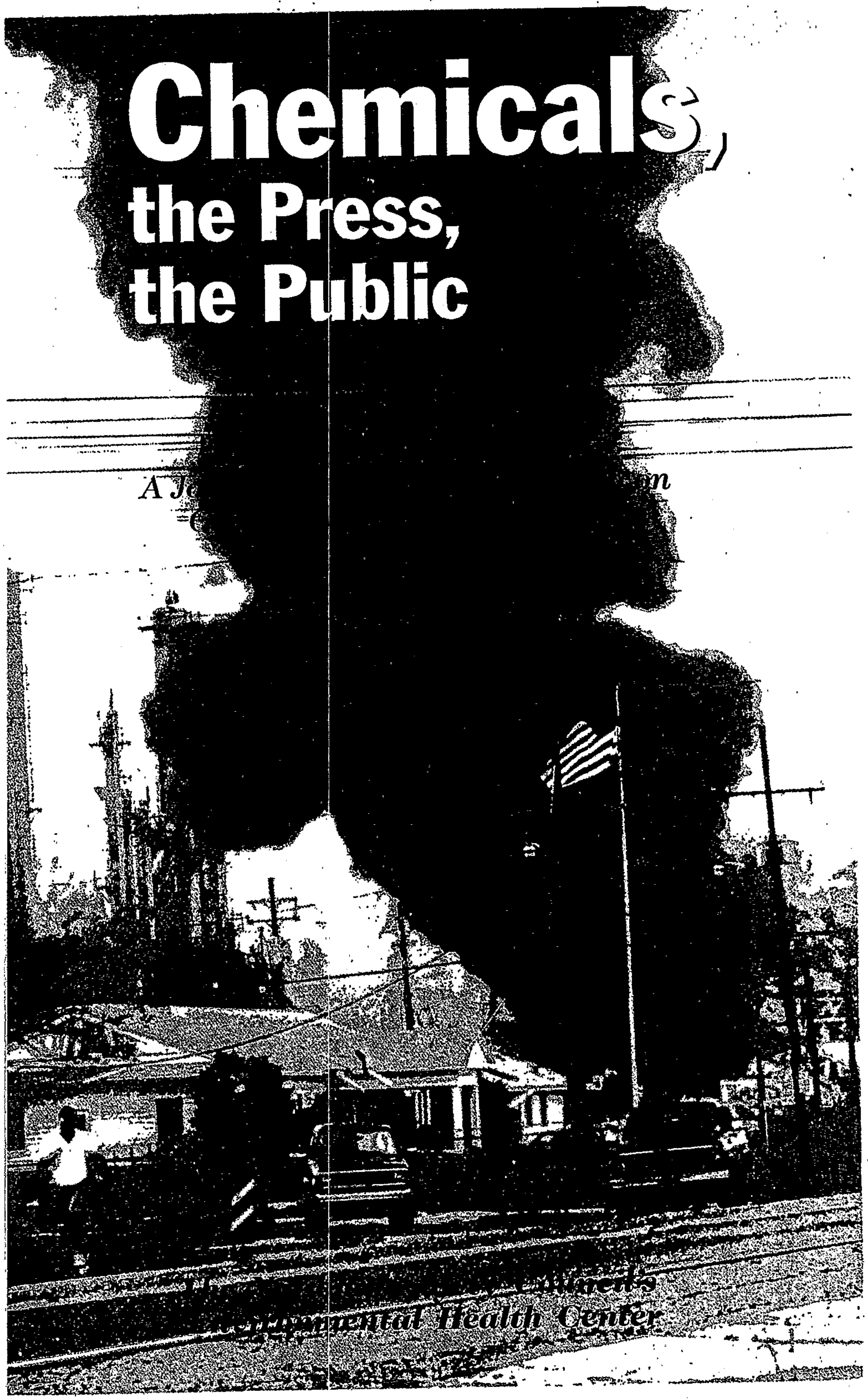
Chemicals, the Press, the Public



Chemicals, the Press, & the Public

A Journalist's Guide to Reporting on Chemicals in the Community

Second Edition

The National Safety Council's Environmental Health Center
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March 2000

A publication of the National Safety Council's Environmental Health Center

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The Environmental Health Center produced this guide under cooperative agreement CX 826604-01-0 with the U.S. Environmental Protection Agency. It is part of a series of publications on the Risk Management Program Rule and issues related to chemical emergency management.

For More Information

The National Safety Council maintains the Crossroads Web site at http://www.crossroads.nsc.org as a resource supplement to this series of publications. The site has Risk Management Program-related links to organizations, regulations, chemicals, rules, and regulations involved in emergency management and the safe handling of chemicals and other safety, health, and environmental issues. A selection of articles and papers written about the Risk Management Program Rule and local efforts to identify and analyze risk in the community is also included. The site will be constantly expanding as industry and communities develop new information required under the Risk Management Program Rule.

Preface

March 2000

Environmental journalists have a new weapon in their arsenal for better informing their audiences about potential risks and hazards close to home. The new tool provides them with one more powerful resource for better informing their print and broadcast audiences on how to reduce potentially risky exposures and, better yet, how to help avoid exposures in the first place.

The 1990 Clean Air Act's Section 112(r) paved the way for journalists and the public to access the new chemical "risk management plan" (RMP) information, but the data itself first became widely available online and in hard copy only in the summer of 1999, after much controversy over just how much—and which parts—of the information would even be distributed electronically.

The RMP information comes on the heels of another three-letter acronym well known to environmental journalists: TRI, or the toxics release inventory, is also available electronically to provide reporters, the public, and local emergency response teams accurate information on facilities' on-site inventories and releases of toxic chemicals.

One more acronym, again one well known to environmental journalists, is RTK, or right to know. RTK is the movement that got a major boost in 1986 with passage of the Emergency Planning and Community Right to Know Act (EPCRA) as part of the Superfund amendments passed that year. Consider this formula:

RMP = TRI + RTK

The RMP program, the subject of this sequel to the Environmental Health Center's 1989 *Chemicals, the Press & the Public* reporter's guide on the TRI program, is the progeny of more than a decade of experience with TRI and RTK generally. In the current vernacular, reporters might look to RMP as something of a TRI on steroids. Or perhaps Viagra.

Just how, and how effectively, the media uses this new trove of hazardous chemical information remains to be seen. The data available clearly are more specific, and therefore more powerful, than what facilities previously had been required to report. Reporting facilities now must make public potential risks posed to surrounding communities.

But reporting on local facilities' efforts to prevent accidents from happening in the first place may be just the "day-one" story. Reporters and their audiences might find equally appetizing the "day-two" story of just what local governments and policy makers are doing, and in some cases perhaps *not* doing, with the newly available information to make disaster and accident prevention a reality and not solely a paper or academic exercise.

The information power represented by the RMP program is considerable. But data have limits and recognizing both the strengths and the practical limitations of the RMP data is key to responsible and knowledgeable reporting in this area. As did its predecessor reporter's guide *Chemicals, the Press & the Public*, this guide seeks to help journalists—and through the media, the public generally—get every last ounce of useful information out of the RMP program information. Equally, it seeks to help them recognize the inherent limitations—where, as they say, the dog just won't fight. At that point, of course, additional enterprise reporting becomes key.

How communities themselves will choose to use the newly available RMP information likely will vary from place to place, but that factor cannot and should not influence the media's responsibilities to provide the relevant information as clearly and as accurately as possible.

Study after study reinforces that most of the people most of the time get most of their information on the environment from the mass media. That's a sobering burden that both delights and somewhat scares responsible journalists having to shoulder that responsibility.

Through the RMP program as it has built on and expanded its RTK and TRI roots, society has provided itself and its news media with a new tool for staying abreast of potential community risks from hazardous chemicals. With that new tool goes journalists' responsibility to use it wisely. We hope this reporter's guide will prove useful in meeting that objective.

Bud Ward
Executive Director
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The Bhopal Disaster

Just after midnight on December 3, 1984, many residents of Bhopal, India, (population 900,000) awoke with their eyes burning and coughing and gasping for breath. A toxic cloud was drifting through the shantytown neighborhoods surrounding the plant where Union Carbide of India, Ltd., was manufacturing pesticides to help Indian farmers feed a booming population. For nearly two hours, a deadly cloud of some 40 tons of toxic methyl isocyanate crept along the ground 5 miles downwind. Few of those rubbing their eyes and stumbling outdoors had any idea what was happening; most could do little to protect themselves.

The uncontrolled release killed approximately 1,430 people immediately, and more than 3,800 died by 1991. Many thousands more were injured—possibly 20,000 were severely injured (many totally disabled), and another 186,000 were less severely injured. Deaths and injuries were worst among the desperately poor who lived just outside the chemical plant's fence. But the numbers will never be very precise, because information was scarce.

The investigations that followed, conducted by Union Carbide and various Indian government agencies and outside panels, probably never got the whole truth. Politics, emotion, self-interest, information suppression, and contamination of evidence clouded almost all attempts to describe what happened. By most accounts, however, it was clearly the biggest industrial disaster in modern times.

Union Carbide, one of the largest corporations in the world at the time, faced more than $3 billion in liability claims from the Indian government. The Indian government accused the company and its U.S. officials of criminal homicide. The company accepted "moral responsibility" and, eventually, $470 million in liability, but it emphasized its own investigators' conclusions—that the release had been caused by sabotage by a disgruntled employee. Other accounts pointed to error, negligence, and bad maintenance by the plant's operators or to an inherently unsafe size and design imposed on the plant by the U.S. parent company's engineers.

Bhopal was a disaster waiting to happen. Warnings of all kinds were ignored. The back-up safety systems didn't work—temperature and pressure gauges, refrigeration units, gas scrubber, flare tower, water curtain, overflow tanks, and alarm signals. Plant operators failed to respond promptly or effectively to instrument readings and other signs. In May 1982, a Union Carbide safety team from the U.S. headquarters had reported the potential for just this kind of accident. And a series of local newspaper articles before the incident had warned residents of the hazards.

The Bhopal plant disaster was a warning that Congress heeded when it passed the Emergency Planning and Community Right-to-Know Act of 1986, which had been known as the "Bhopal bill."

Chapter 1

Introduction and Background

In the summer of 1999, a new generation of hazardous chemical information went online and became available to reporters and the public. Even before its release, it generated intense controversy.

June 1999 was the deadline for approximately 64,000 facilities to file their risk management plans (RMPs) required by Section 112(r) of the Clean Air Act (CAA). The law was amended in August 1999 by the Chemical Safety Information, Site Security, and Fuels Regulatory Act (P.L. 106–40) to exempt about half of those facilities from reporting—primarily those selling propane and other flammable fuels.

The RMPs contain chemical hazard data that are more specific than companies were previously required to report. For example, companies must identify potential hazards and the possible harm these chemicals could do to surrounding communities. These analyses, referred to as offsite consequence analyses (OCAs), include both "worst-case scenarios" and "alternative (or more realistic) scenarios."

The law requires the U.S. Environmental Protection Agency (EPA) to make the RMPs available to the public. In fact, public disclosure of the RMP data has become a big story itself. The August amendments strictly limited the dissemination of the OCA information for at least 1 year. By August 2000, EPA must assess the risks and benefits and issue regulations about how the OCA data will be disseminated. Executive summaries and other RMP information are available on the Internet through EPA's RMP*Info™. In addition, most of the facilities reporting under the law are required to hold a public meeting to discuss their RMPs, including OCA information.

Accident Prevention—the New Name of the Game

The real news about the RMPs and other provisions of the 1990 law is that they provide additional incentive for companies, communities, and reporters to focus on preventing accidents from happening in the first place. Perhaps the other real news is that, while the 1986 Emergency Planning and Community Right to Know Act (EPCRA) required committees of local emergency officials to file plans, the RMP Rule requires the *companies* to file plans. The question is shifting from "What is the local government doing to prevent disaster?" to "What is the *company* doing to prevent disaster?"

The good news is that companies can do a lot today to reduce the likelihood that accidents will happen or that accidents will harm people if they do happen. Many of these strategies also help reduce routine toxic emissions. Some examples include using up dangerous chemicals as soon as they are produced to keep the onsite inventory down, using safer chemicals, and handling chemicals at lower temperatures and pressures. Good operating procedures, good operator training, and good maintenance are other examples.

Still, chemical hazards cannot be prevented unless they are first understood and foreseen, and good information is one of the key ingredients in managing these hazards. The stories of almost all the terrible chemical disasters of the last century can easily be told as stories of warnings unheeded. It isn't necessary to wait for disasters to happen.

What to Expect from this Book

This book provides a summary of the requirements for RMPs and related activities and the requirements under EPCRA. This book attempts to explain not only the enormous potential of the available chemical information, but also the limitations of the data. It provides tools and tips to help you interpret the chemical risk information. It includes some examples of reporters' actual experiences reporting on chemicals in the community, some tips and insights on reporting on chemical emergency planning and actual chemical emergencies, and a discussion of some of the limitations of the chemical hazard data. Several sections of the book contain lists of suggested questions. These are among the most important tools in this book.

The RMPs are typically full of the technical jargon. This book attempts to decode some of it. But to get the real story, reporters may have to pursue company officials into technical thickets beyond the scope of this book. However, this book will try to lead you to sources that *can* help.

Why Cover Hazardous Chemical Stories?

If you are a reporter or producer, you may have had to pitch a toxic chemical story to a skeptical editor. Maybe the front page was crowded with train wrecks, politics, and crime, and your editor wanted to know why there was a story if nobody had been killed. According to the Chemical Safety and Hazard Investigation Board (CSB) (1999), toxic and hazardous chemicals do kill an average of more than 250 people every year.

Fortunately, the disastrous explosions that make electrifying footage are fairly rare. That's part of what makes them news. But there's a lot more to the story. Smaller releases injure or kill workers almost daily. They can also force people from their homes, snarl freeway traffic, make asthmatic children wheeze, and disrupt lives in other ways. The chronic everyday leaks and emissions of toxic pollutants in some places are suspected of causing elevated rates of cancer, birth defects, and neurological and reproductive disorders. In many towns, jobs are at stake or are perceived to be.

Information about the risks of hazardous chemicals is a very hot commodity. Environmental groups strive to get it into public hands, sometimes magnifying the risks. Chemical companies have lobbied and litigated against disclosure at the national level, sometimes downplaying the risks or citing new risks from terrorism or sabotage. People's lives and health can depend not only on the availability of the information, but also on its accuracy and realism. Consider some examples.

A huge explosion devastated the Terra Nitrogen Company fertilizer plant near Sioux City, Iowa, on December 13, 1994. Four people died and 18 people went to the hospital. More than 5,700 tons of anhydrous ammonia spilled, and nitric acid and liquid ammonium nitrate also spilled in large amounts. A cloud of toxic ammonia lingered for 6 days, spreading for miles around the plant. About 2,500 people were evacuated.

A subsequent EPA investigation showed many problems. Safety audits had been inadequate. There were no written procedures for safe operation of the plant. Employees said they were unaware of the hazards of ammonium nitrate. Four years later, Terra admitted that by failing to report some 17 million pounds of toxic chemical releases to the environment in 1994, the company had hidden the fact that it was one of the largest emitters of toxic substances in the country.

The General Chemical plant near Richmond, California, drew up a worst-case scenario for a chemical release from its facilities, as required by state law. Company officials predicted a worst-case accident would affect people no farther than 1¾ miles away. Then on July 26, 1993, a release of sulfuric acid mist (sulfur trioxide) from the General Chemical plant sent 24,000 people to clinics and emergency rooms. People were affected more than 9 miles away.

Many communities will be interested in learning about hazardous chemicals that can jeopardize their health. They will also be interested in finding out the level of risk posed by local facilities. Chemical hazards are more likely to be addressed if local stakeholders—people who would be affected by an accident—know about potential problems and have a say in the solution. Stakeholders include individuals such as company managers, workers, and stockholders; neighboring residents and workers; and local officials.

Different communities will reach different decisions about the information they learn from RMPs. According to Carole L. Macko of EPA's Chemical Emergency Preparedness and Prevention Office, "The final evaluation of risk will be made by the public and local officials at the local level." Audiences will be interested in the reactions of local emergency authorities, government officials, business leaders, facility managers, neighbors, and environmental groups to RMP content. News coverage can help people evaluate their options. Some communities may think they have to live with poorly managed hazards when there may be alternatives. Once they know about hazards and risks, communities can choose to use or ignore that knowledge. But without local coverage, RMPs will be like the proverbial tree that fell in the remote forest without being heard.

Ten Years of Toxic Release Inventory

In 1986, Congress gave journalists a valuable tool when it passed EPCRA, in many ways the first full-fledged chemical right-to-know law. The law, which was not fully implemented for several more years, did four important things:

- It set up a state and local institutional structure to *plan* for chemical emergencies and required the response plans to be made public.
- It required plants to *notify* local, state, and federal authorities when a major release occurred.
- It required companies to *estimate and report* their toxic releases to EPA and state agencies.
- It required EPA to collect this information in a national database (the Toxic Release Inventory) and *make it available* to the public.

The Toxic Release Inventory (TRI) database gave environmental reporters more than just handy local statistics—it gave them a powerful investigative tool. Suddenly reporters could look at patterns of pollution in all kinds of meaningful ways. For example, reporters could examine the environmental performance of a single large company in many sites across the country. Reporters could locate the hotspots of pollution by a single toxic substance like *benzene, a known carcinogen.* Reporters could compare the releases companies were reporting with information from other sources (such as state or federal permit programs) to determine whether companies were doing what they said they were.

TRI has become a "meat-and-potatoes" story—a reliable, stable source of stories on the environmental beat. The stories tend to ask and answer some basic questions. Who are the worst polluters in our area or state? How does our state match up against others? Are we doing better than last year?

Because the TRI has now accumulated more than 10 years of data, it can be used to analyze important pollution trends (see figure 1). EPA and others have made enormous strides in integrating TRI with many other EPA databases and environmental databases by using standardized facility identification numbers and geographical information systems. New user-friendly front ends like EPA's Envirofacts Warehouse (http://www.epa.gov/enviro) and the Environmental Defense Fund's (EDF) Chemical Scorecard (http://www.scorecard.org) have made using the data much easier to use.

Chemicals—Substances with an Image Problem

The word "chemical" carries negative baggage. People are often suspicious about the harm (e.g., cancer, birth defects, reproductive

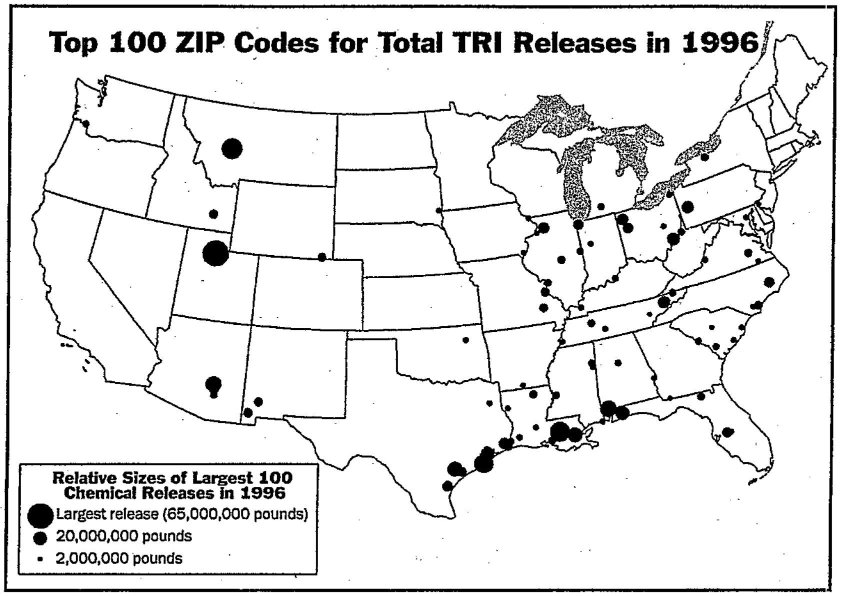


Figure 1: When the ZIP Codes with the greatest total TRI releases are plotted, their concentration in certain industrial and mining areas is obvious. Source: *1996 TRI Public Data Release Report.*

and neurological disorders) chemicals can cause. But without chemicals, we could not feed the world, drive our cars, cure disease, print newspapers, or use computers.

Most of our physical world consists of chemicals. But when we use the word, we often mean compounds that have been synthesized by chemists or that are used in industrial processes.

The media often gets caught up in this emotional portrayal of chemicals and their risks and benefits to society. This is understandable. On the one hand, the chemical and manufacturing industries have public relations machinery telling us that chemicals are the answer to our problems, that the risks they present are negligible and under control, and that any further government control of those risks is unnecessary. On the other hand, environmental and health groups raise concerns about cancer clusters, contamination in the water and air, and the harm that potential chemical spills might do to neighbors of chemical plants.

Chemicals have numerous benefits in today's world. Without sewage treatment and drinking water purification—processes that involve chemicals—sickness and death from waterborne diseases like typhoid and cholera would not have been largely eliminated. Chlorine and chlorine compounds play a key role in water disinfection and in the synthesis of many chemicals used in modern life. Chemistry also played a big role in the development of antibiotics, which have cut death rates from infectious disease worldwide. Synthetic pesticides and chemical fertilizers, along with improved seed, helped increase production and fuel the "Green Revolution," which has reduced starvation in much of the world.

Our society's confidence in chemicals began to dwindle in 1962 with the publication of Rachel Carson's *Silent Spring*. At this time it was also discovered that insecticides like DDT, relied on for their dramatic help in controlling crop pests and human disease, were persisting in the environment and accumulating in living creatures, with devastating effects. By the end of 1962, some 40 pesticide regulation bills had been introduced in various state legislatures.

Chemical Regulation and the Role of the Media

The rise of the environmental movement and the institutionalization of environmental controls in the 1970s and 1980s often occurred through a crisis-and-response process. A 3-million-gallon oil spill in the Santa Barbara Channel in 1969 led Congress to give the Coast Guard and EPA oil spill response authority in Section 311 of the 1972 Clean Water Act. The seepage of toxins into the basements of the people of Love Canal, New York, in 1976–1978 led to the

Superfund hazardous waste cleanup law in 1980. The Bhopal disaster of 1984 led to the passage of EPCRA in 1986. The Exxon Valdez spill of 1989 brought passage of the Oil Pollution Act of 1990.

The press has typically played a role in publicizing a threat or a crisis. But it has been less involved in covering the political ins and outs of legislative solutions or in the tedious technical and regulatory process of implementing environmental laws. That job has too often been left to the specialized trade and business press. The result is that average citizens often know little about what, if anything, the government is doing to protect them against hazardous chemical risks.

When the president signs a major environmental bill, it gets on the nightly television news. But the story isn't over at that point. If the press doesn't follow up on legislative or regulatory action to make sure government is doing its job, the public may go unprotected.

An example is the hazardous air pollutant provisions of the 1977 Clean Air Act Amendments That law required EPA to set national emission standards for hazardous air pollutants. But by 1990, EPA had set standards for only seven of the hundreds of toxic or hazardous air pollutants to which people are exposed, in part because scientists are unable to identify an air concentration or exposure level at which the risk to health is zero for many of these pollutants. Even at infinitesimal amounts, these pollutants can present risks, although the risks may be infinitesimal. Setting standards for some toxic air pollutants would have removed them from commerce altogether.

There was no perceived "crisis." Health and environmental groups complained, but the deadlock got little press attention. News consists of something happening, and this story was about something not happening—and something dry and technical to boot. Congress finally tried to fix the situation in the 1990 CAA. The 1990 law took a new approach based on industry sectors and best achievable technology.

The 13 years of paralysis on air toxics from 1977 to 1990 is an example of the perfect being enemy of the good. It also demonstrates the shortcomings of the way the press (and environmental health advocates and the public) often look at risk. Readers, viewers, listeners, and editors may simply want to know if a thing is true or untrue, safe or unsafe, and have little patience for shades of gray.

Toxics become news when a camera crew finds a weeping mother whose child has been stricken with leukemia or when a siren sounds and a thick, black cloud towers above the local petrochemical refinery. But the quiet, everyday stories are just as important.

Once TRI data started to be reported in the late 1980s, people started to get a concrete sense of the huge amounts of toxic and hazardous pollutants emitted every year (figure 2). The estimate for 1988, the first year for which TRI data were reported, was that U.S. facilities released 3.35 billion pounds of toxic substances to air, water, and land. And most of these releases were completely legal.

Regulation Through Information

EPCRA embodied some rather revolutionary ideas about government. Part of the philosophy was "forewarned is forearmed." EPCRA came at a time when there was very little effective government regulation of toxic air emissions. The hope of some of the bill's supporters was that if the American public was really aware of the problem, something might be done to reduce risks.

While there may be no scientific proof that EPCRA reduced hazardous chemical releases, the evidence is abundant. During the first 10 years of TRI reporting, the estimated releases of toxic substances have dramatically and steadily reduced. Releases of core chemicals—those that have been reported consistently for the entire 10 years—decreased by 1.53 billion pounds from 1988 to 1996, a decline of 45.6%. (figure 3). The largest reduction by weight was in air emissions (1.10 billion pounds or 49.8%). In terms of percentage reduction, the largest decrease was in surface water discharges (119.4 million pounds or 72.6%).

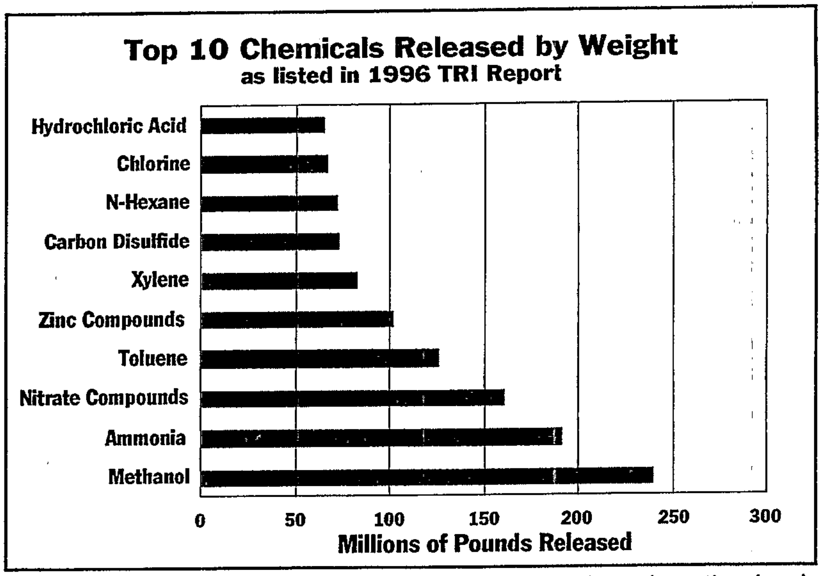


Figure 2: The importance of particular chemical releases depends on the chronic or acute toxicity of the chemical, as well as whether it is transformed to a less harmful substance after entering the environment. Source: *1996 TRI Public Data Release Report*.

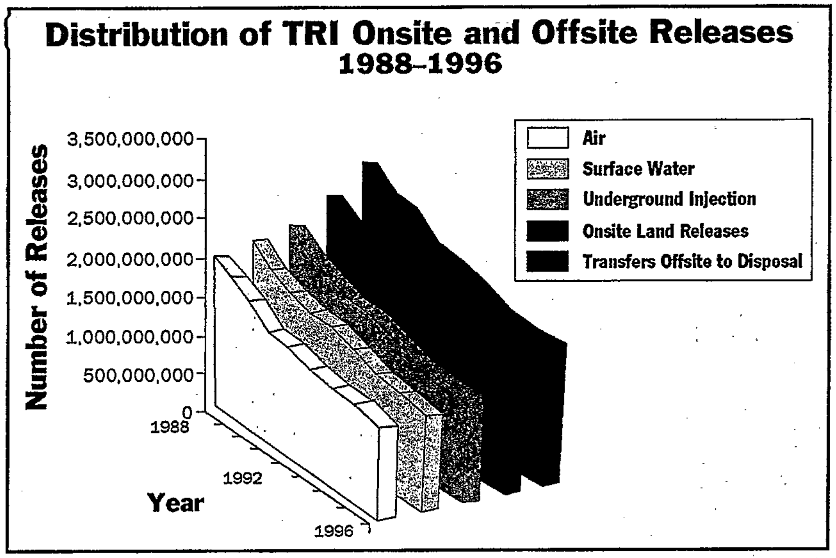


Figure 3: The general downtrend in TRI releases over a decade resulted not only from changes in the list of chemicals but also from real pollution reductions. Source: *1996 TRI Public Data Release Report.*

Why believe the reduced releases were caused by TRI? One reason is relatively few major new regulatory requirements limiting toxic releases were issued during that period. The requirements of the CAA didn't start kicking in until the period was mostly over.

Some of the evidence is anecdotal and subjective, but chemical executives have acknowledged the impact. "The law is having an incredible effect on industries to reduce emissions, and that's good," Tom Ward of Monsanto told the Iowa's *Quad City Times* in the June 8, 1990. "There's not a chief executive officer around who wants to be the biggest polluter in Iowa." The *Los Angeles Times* reported in the December 9, 1991, issue that Caspian Inc., a California metal milling and finishing firm, found itself ranked as the 55th largest emitter of carcinogenic air pollutants in the United States. The firm responded by developing a water-based coating that could be substituted for one containing the carcinogen perchloroethylene. It reduced its toxic emissions 60% in the first year and eventually by more than 99%.

Sources of Chemical Releases

A reporter or producer thinking about chemical emergencies and toxic releases will find more stories by thinking "outside the box." The big chemical companies have usually done far more safety engineering than other companies. If you think your viewer or reader area doesn't have chemical risks because it has no big chemical plants, you may be missing the story.

For example, accidents and releases occur most often at fuel-handling facilities, including propane dealers. The second most common "accident-prone" facilities are municipal drinking water purification and sewage treatment facilities. Both store and use large quantities of chlorine, a highly dangerous gas, to disinfect water. Agricultural retailers make up a major group of the facilities required to file RMPs. They may handle such things as fuels, pesticides, anhydrous ammonia, and ammonium nitrate fertilizer.

Many different industrial sectors can present chemical hazards. Some are obvious, like explosives or fireworks factories. Others may be less obvious, such as any place with a large refrigeration facility that uses ammonia, even a warehouse or supermarket. A wide variety of manufacturing facilities use significant amounts of hazardous chemicals—everything from toy manufacturers to pulp mills to shipyards.

Chronic and routine releases may cause even more harm than catastrophic ones, but they often get less attention from the media. TRI includes these routine wastestreams to the air, water, and land. While many of these chemical releases are controlled under federal permits, others are virtually unregulated. A plant may be releasing toxics but may not need to report it. The amounts involved may be below the reporting threshold, or they may consist of many small leaks; long-term, low-level leaks (fugitive emissions); or stormwater runoff from a large land area (known as nonpoint source water pollution).

While people often associate releases with industrial plants, about the same number result from transportation-related incidents. Hazardous substances may move by air, truck, railcar, boat, or pipeline. Of the roughly 600,000 chemical incidents reported between 1987 and 1996, 42% occurred at fixed plant or business sites, while 43% were related to transportation (the rest were "other") according to the CSB (1999) (figures 4 and 5).

Often the people most endangered by both chronic and catastrophic releases are the employees at the plants. They may be in direct physical contact with hazardous substances, often in large amounts. In some cases, their exposure may be daily over many years with cumulative effects.

Government Agency Roles in Chemical Releases and Exposure

Many different government agencies are involved in responding to and preventing chemical releases and emergencies. While this book focuses on two particular EPA programs (EPCRA and the RMP

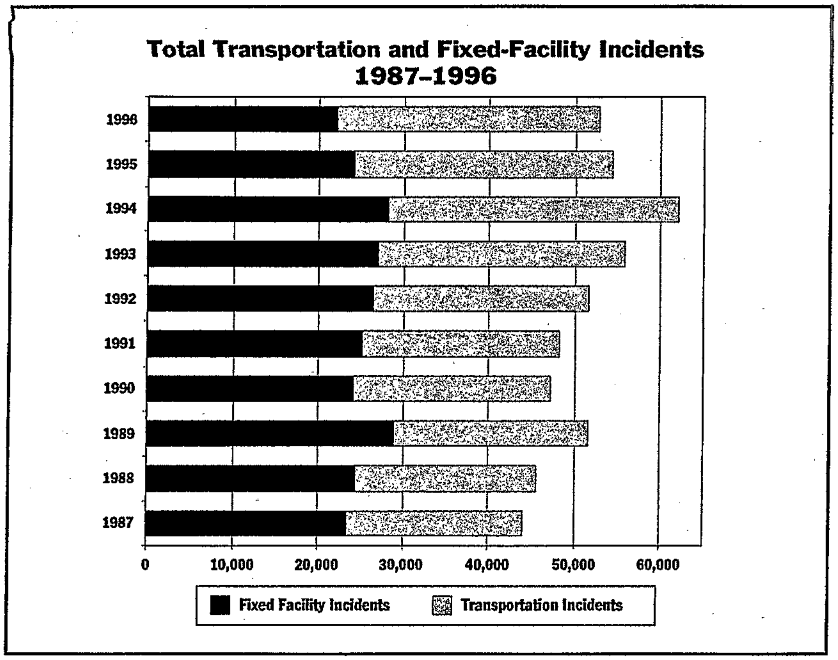


Figure 4: RMP and EPCRA address accident prevention only at facilities. Transportation-related incidents account for a significant percentage of all releases and represent a major threat to worker and public safety. The CSB reported that an average of approximately 60,000 hazardous materials incidents occurred annually between 1987 and 1996, and 42% of these incidents occurred at fixed facilities. Hazardous incidents were placed in five categories: fixed facility, transportation, outside, other, and no data. This chart only reflects data on two of these categories and represents 85% of the total incidents during this period. Source: *CSB 600K Report Executive Summary,* 1999.

program), a reporter may have to talk to many other government agencies to get the whole story.

Occupational hazardous and toxic exposures, for example, are regulated by the Occupational Safety and Health Administration (OSHA). Pipeline safety issues are regulated by the Department of Transportation's (DOT's) Office of Pipeline Safety. Other modes of hazardous materials transportation fall under the DOT's Office of Hazardous Materials Safety. Accidents may be investigated by the National Transportation Safety Board (NTSB), OSHA, or the CSB. The Federal Emergency Management Agency (FEMA) may also be involved in responding to chemical disasters. Various state agencies may be involved with regulating chemical hazards and responding to emergencies.

The central point for coordinating government response to chemical releases is the National Response Center, which is operated by the U.S. Coast Guard. The NRC was created by the National Oil

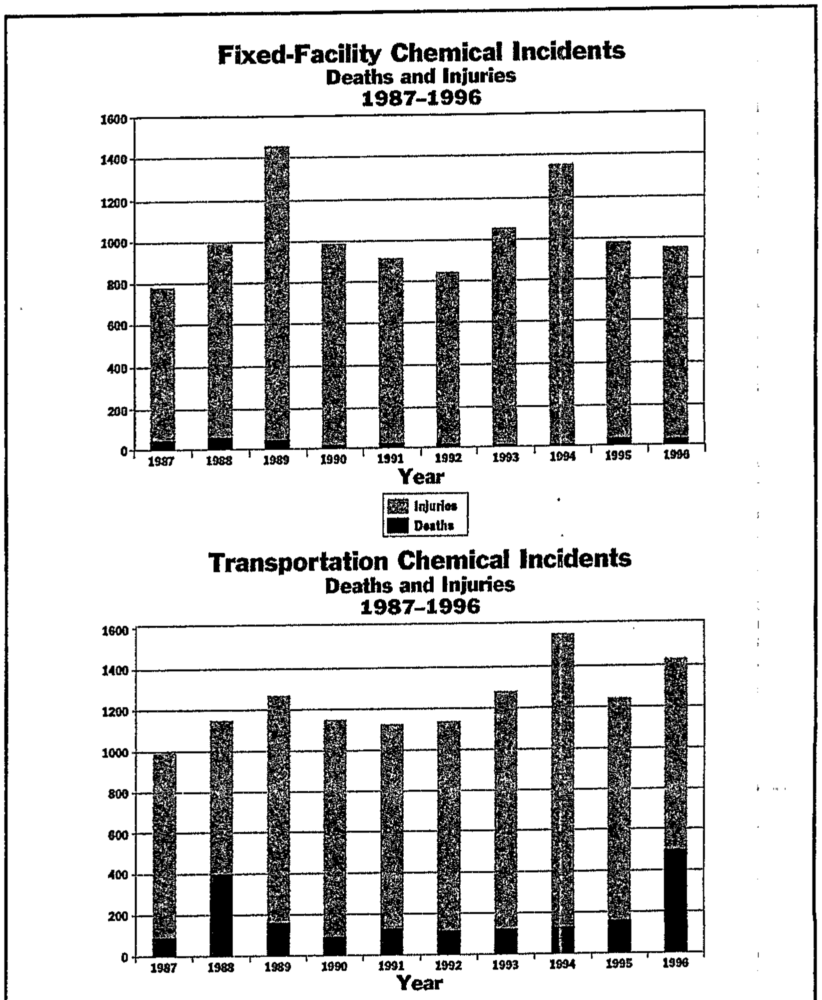


Figure 5: The CSB concluded that over the 10-year study period, approximately 2,550 people were killed or injured as a result of a chemical incident. There were 2,565 deaths (with an average of 127 incidents per year with at least one death) and 22,949 injuries. Source: *CSB 600K Report*, 1999.

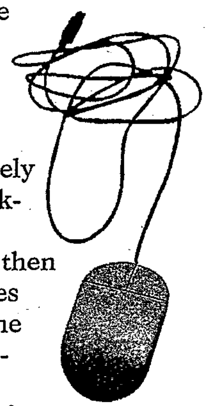
and Hazardous Substances Pollution Contingency Plan, Title 40 CFR, Part 300. All oil, chemical, radiological, biological, and disease-causing discharges into the environment anywhere in the United States must be reported to the NRC. All reports of pollution incidents are entered into the Incident Reporting Information System (http://www.uscg.mil/foia.htm). None of these even touches on what may be the most important agencies of all—the local emergency responders.

Chapter 2

Tales from the Trenches: Reporters' War Stories

In 1989, in the dawn of "computer-assisted reporting," Congress had required EPA to put a huge database full of local detail about the use and release of hazardous chemicals online. They called it TRI, the Toxic Release Inventory, and many reporters (and environmental activists) thought it would be the silver bullet, the ultimate investigative tool. They were right and wrong. Ten years of experience with TRI has shown some ways in which those high expectations were justified—and some ways in which they were not. Journalists have done hundreds and hundreds of good stories using TRI, and some have discovered the pitfalls along the way.

Finding and Digging for Hidden Treasure with a Computer



In the fall of 1988, Scott Thurm, a reporter with the Louisville *Courier-Journal,* asked Kentucky state officials to see the toxic release reports for the state. EPA's electronic database would not be available until 1989, and the 1,254 individual reports—submitted by 254 facilities—were being stored, largely unread, in cardboard boxes in a state office in Frankfort. Thurm went to the Kentucky Department of Environmental Protection to look at the forms and then entered selected information from the written copies into a database on a portable computer. Handling the data himself allowed him to pick out things no computer could have showed him.

Thurm noticed, for example, that an aluminum refiner reported it was sending 14 million pounds per year of aluminum dross to a disposal site at a former quarry. Thurm happened to know that EPA had proposed this quarry the Superfund National Priority List precisely because of the environmental hazards posed by aluminum dross previously discarded there. "Watching the reaction of a top state environmental official when I asked why this was being permitted made all of the work seem worthwhile," Thurm recounted.

The *Courier-Journal's* analysis revealed all sorts of interesting things. Most importantly, it was clear that Kentucky's major industries were emitting a wider variety of potentially hazardous air pollutants than the state had previously been aware of, including several suspected carcinogens that were completely unregulated. Other findings included the following:

- The TRI data revealed places where large amounts of toxic barium, chromium, and zinc might be entering the sewers of the Louisville-Jefferson County Metropolitan Sewer District—previously unknown to officials.
- From the TRI data reported by the newspaper, the Louisville-Jefferson County Metropolitan Sewer District discovered that 130,000 pounds of acrylonitrile (a probable carcinogen) could be going into its system. The district did not test for this chemical.
- In the Jefferson County Air Pollution Control District, TRI data revealed firms emitting more of some hazardous chemicals than they had reported previously—33 times more in the case of certain emissions of the toxic solvent toluene.
- On only 3% of the forms did companies volunteer information about what they were doing to reduce emissions.

Thurm said the project

> generated as much response as any other environmental story I've written. First, about a week after I started putting information into a computer, state officials—who had ignored the reports for three months—did likewise. I suspect they didn't want me to know anything they didn't know. Whatever the reason, it allowed them to start probing discrepancies with permits and other records. Second, officials were genuinely surprised by the totals.

According to Thurm, as a result of the *Courier-Journal's* analysis, state and local officials started taking action to control some of these problems. They began revising Kentucky's regulations for air releases of toxic chemicals and commissioned a comprehensive environmental study of the area around a chemical complex in western Kentucky that the reports showed to have the most concentrated releases.

What was important was not merely the gross statewide totals (225 million pounds of toxic chemicals released in 1987) or the listings of which counties had the greatest emissions. What mattered in the end was that the story was being done at all. It focused the attention of the public, state and local officials, and the companies themselves on environmental problems that were not being regulated.

That was just what the 1986 law that created TRI was intended to do. The *Courier-Journal* was way ahead of state regulatory agencies in analyzing the data and in pointing to the problems the data revealed.

Realizing the Pitfalls: Data Are Only Human

Another experience, recounted by Mitchel Benson, then a reporter for the San Jose *Mercury News*, showed how things can go wrong with TRI data.

In August of 1988, the Silicon Valley Toxics Coalition held a news conference on the lawn outside a San Jose manufacturing plant. With the first batch of TRI data in hand, the group announced that 25 major corporations in Santa Clara Country (a.k.a. Silicon Valley) had legally dumped more than 12 million pounds of toxic and cancer-causing pollutants into the air, land, and water. Furthermore, the coalition proclaimed, Advanced Micro Devices (AMD), a Sunnyvale, California, semiconductor maker, was the county's top polluter, based on data AMD itself had filed for the TRI.

"I should have called AMD right then and there," Benson said, "but, frankly, I didn't. Why? Because I had copies of AMD's actual reports. And I could see in black and white where the toxics coalition was getting its numbers. The next morning, after the story appeared, AMD's press officer called me," Benson recalled. "In fact he called me several things."

Benson's story was wrong, and the toxics coalition was wrong—because, it turned out, AMD had filled out the EPA forms wrong. They filled out the forms to say that tons of extremely potent acids were being dumped directly into San Francisco Bay, when in fact the acids were being neutralized into rather benign salts before being discharged. Benson says he learned one thing: "Check everything twice—maybe three times."

The lesson is that hard data and computer analysis can often inspire more confidence than is really justified. Data and analysis are only as reliable as the people who produce them.

Understanding the Annual Release of TRI Data

Every year, generally around May or June, EPA puts out its annual TRI Public Data Release Report. It neatly and exhaustively summarizes the TRI data collected for the previous year's reporting cycle. And every year reporters all over the country do stories on EPA's report. Most often, they write about the national trends and try to localize the toxic release story to their area. The abundance of both local and comparative data makes it easy to localize.

The TRI report analyzes data by state, industry, chemical, medium (air, water, land), type of release, and even, in some cases, potential health effects. The annual TRI report may also have special focus sections on carcinogens, pesticides, wastestreams, or source reduction. Other sections focus on specific industries such as petroleum, pulp and paper, and chemical products (which is further broken down into categories like plastics, drugs, and other products). It also includes all the necessary background, context, and caveats about the limitations of the data.

There is a time lag in reporting TRI data that may throw your editors for a loop if they are not familiar with it. For example, the "1996" TRI annual report actually came out in 1998. Companies don't report on their releases for a year (until June of the following year). EPA then takes almost a year to organize the data and prepare a report. Tell your editor no news organization has data any fresher than this.

The lead paragraphs on most TRI annual report stories tend to be fairly predictable:

From the July 3, 1998, *Puget Sound Business* Journal—
"Washington companies that discharge toxic chemicals released 2.6% less in 1996 …."

From the June 19, 1998, *Morning Star* (Wilmington, NC)—
"North Carolina industries cut legal toxic releases to air, land, and water by 6% in 1996, lowering the state's national ranking from 7th to 10th, the Environmental Protection Agency reported."

From the June 19, 1998, *Indianapolis Star*—
"Indiana ranks fifth in the nation in the millions of pounds of toxic releases to air, water, and land. And it's largely due to Nucor Steel in Crawfordsville."

From the June 20, 1998, *Deseret* News (Salt Lake City, Utah)—
"No matter how you add it up, Utah's top corporate polluter—and one of the nation's top polluters—is still Magnesium Corporation of America in Tooele County …."

From the June 19, 1998, *Denver Post*—
"The quantity of toxic chemicals emitted into Colorado's air dropped by 14% in 1996 over the previous year, but releases into surface water shot up 209%, according to a report …."

TRI annual report stories tend to focus on "how our state did," "best-and-worst-of," top 10s, rankings, and trends of improvement or aggravation in pollution.

These are all meat-and-potatoes stories. They have plenty of hard facts and often include a local angle. The timing is fairly predictable (EPA issues a media advisory at least a day ahead), and it is often newsworthy enough for the front page. Reporters tend to take what they get from the report rather than doing a lot of original reporting and research.

While this type of story is often newsworthy, journalistically, a lot more can be done with chemical right-to-know data.

Reporting the National Overviews

Some of the most worthwhile reporting that has been done with TRI data has tried to present a national survey or overview (much like the TRI annual report itself, but with less governmentese and some journalistic value-added). While this type of story may be more typical for national media, it can also help local reporters put their own community's situation in perspective.

A classic of the genre was a story by John Holusha, published October 13, 1991, in the *New York Times.* It took a full page (albeit page 10) and was loaded with graphics. At the top of the page was a huge U.S. map under the head: "The Nation's Polluters—Who Emits What, and Where." Individual counties were shaded darker according to the size of their volume of toxic releases. Smaller maps showed which states had the greatest air and water releases. Bar graphs illustrated "The 10 Biggest Polluters," as well as the top 10 polluters for water and air. The story named individual companies and featured their corporate logos.

The point of the story was that TRI data were having a "powerful impact on corporate behavior." That was not simply because companies wanted to avoid the top-10 lists and the glare of publicity. The story reported that investor groups were using TRI data to screen companies for their portfolios and that companies were changing practices they had defended as benign simply to avoid negative appearances.

Another classic national take-out was the 3-day "cover story" series that began July 31, 1989, in *USA Today*. *USA Today* reporters Rae Tyson, Julie Morris, and Denise Kalette did their own analysis of EPA's data tapes. *USA Today's* anecdotal lead quoted a Port Arthur Texas woman and made clear that the data only confirmed something her nose already told her—that her county, thick with oil refineries, was one of the most polluted by toxic releases in the nation.

The story broke down the toxics "budget." Graphics showed where major quantities originated and where they went. It also itemized data listings for the top 500 counties in the United States. The story included "top-10" of companies and plants. It also included sidebars itemizing the requirements of EPCRA and profiling the most common hazardous chemicals.

Some of the most revealing news came not from the data, but from *USA Today*'s original reporting. The reporters surveyed 20 towns with the largest toxic emitters and found that only 4 had trained HAZMAT teams. In addition, many of the HAZMAT teams could not get into plants, even in an emergency, unless invited. *USA Today* found many communities had little emergency preparedness—mostly because local firefighters lacked information.

Reporting on Chemical Hazards in the Community

These examples only scratch the surface of what journalists can do with chemical right-to-know data. The data can be a starting point for all kinds of investigative and enterprise stories.

Chapter 3

The Emergency Planning and Community Right-to-Know Act: Key Provisions

EPCRA, according to EPA, "makes citizens full partners in preparing for emergencies and managing chemical risks." EPCRA has two basic purposes: (a) to encourage planning for emergency response to chemical accidents and (b) to provide local communities with information about possible chemical hazards. The law operates through provisions in four major sets of sections.

- Emergency Planning provisions (Sections 301–303) require state and local efforts to develop emergency response and preparedness capabilities based on chemical information provided by industry.
- Emergency Release Notification provisions (Section 304) require *immediate* emergency notification to state and local authorities when one of the hundreds of chemicals designated as hazardous under EPCRA or Superfund is accidentally released to the environment.
- Hazardous Chemical Reporting provisions (Sections 311–312) require all businesses to submit information on chemicals broadly defined as "hazardous" to local and state emergency planners and local fire departments.
- Toxic Chemical Release Reporting and Inventory provisions (Section 313) require certain manufacturers to file an *annual inventory* of chemical releases with EPA and state agencies.

Emergency Planning (Sections 301–303)

Sections 301–303 are designed to help communities prepare for and respond to emergencies involving hazardous substances. Every community in the United States must be part of a comprehensive state emergency response plan.

The governor of each state was required to appoint a State Emergency Response Commission (SERC) by April 1987. A SERC may be housed within one or more existing state agencies, or it may consist solely of individual citizens. Some SERCs have no state agency representative and are staffed entirely by private citizens. These commissions have been named in all 50 states and the U.S. territories and possessions. Contact information for the SERCs is available on the RTKNET Web site (http://www.rtk.net/lepc), at the EPA Web site (http://www.epa.gov/swercepp/sta.loc.htm), and the National Safety Council's Crossroads Web site (http://www.crossroads.nsc.org).

Each SERC in turn has divided the state into local emergency planning districts and appointed a Local Emergency Planning Committee (LEPC) for each district. The number of "local" committees varies widely from state to state. California has five committees

What is a SERC?

A SERC is a commission appointed by the governor of each state to serve as the main source of EPCRA authority and as a source of information for anyone interested in the emergency planning process. A SERC may be a newly formed entity or one or more existing state agencies, such as the environmental, emergency, health, transportation, commerce, and other relevant agencies.

Who serves on a SERC?

The commissions may be made up of members of trade associations, public interest organizations, and others with experience in emergency planning, including representatives of environmental, emergency management, and health agencies. In some states, SERCs consist solely of citizens, with no state representation.

What does a SERC do?

SERCs—

- Divide states into local emergency planning districts
- Appoint an LEPC for each district and help LEPCs and citizens to create effective plans
- Supervise and coordinate the activities of LEPCs and, with LEPCs, establish procedures for receiving and processing public requests for information collected under other sections of the law
- Review local emergency plans annually to ensure such things as coordination across the state
- Receive MSDSs, annual inventories about hazardous chemicals, and notification of accidental releases of hazardous chemicals from facilities

to cover the entire state. New Jersey, on the other hand, has been divided into as many as 588 local committees.

SERCs are responsible for supervising the activities of LEPCs and annually reviewing local emergency plans to ensure uniform coordination throughout the state. Together the SERCs and LEPCs must establish procedures for receiving and processing requests from the public, the media, and others for information collected under other sections of EPCRA.

What is an LEPC?

An LEPC is a local group appointed by the SERC to develop an emergency plan to gather information on chemicals in the community and prepare for and respond to chemical emergencies. It serves as a focal point for the relationship between the EPCRA data and community action.

Who serves on an LEPC?

- Elected state and local officials
- Law enforcement officials, civil defense workers, and firefighters
- First aid, health, hospital, environmental, and transportation workers
- Representatives of community groups and the news media
- Owners and operators of industrial plants and other users of chemicals, such as hospitals, farms, and small businesses

What does an LEPC do?

LEPCs—

- Receive MSDSs, annual inventories about hazardous chemicals, and notification of accidental releases of hazardous chemicals from facilities
- Based on chemical information from local facilities, develop a local emergency response plan tailored to the needs of the district, then publicize it through public meetings or newspaper announcements, get public comments, and test the plan periodically with emergency drills
- Update the plan at least annually
- Make information available to the public
- Take civil actions against facilities if they fail to provide the information required under Title III
- Serve as a focus for community awareness and action concerning the presence of chemicals in the community

LEPCs are the local groups carrying out the law. To truly represent their communities, LEPCs are required to include the following members:

- Elected state and local officials
- Law enforcement officials, civil defense workers, and firefighters
- First aid, health, hospital, environmental, and transportation workers
- Representatives of community groups and the news media
- Owners and operators of industrial plants and other users of chemicals, such as hospitals, farms, and small businesses

Each LEPC must analyze hazards and develop a plan to prepare for and respond to chemical emergencies in its district. The plan should be based on the chemical information reported to the LEPC by local industries and other facilities dealing with chemicals.

All local emergency plans must—

- Use the information provided by industry to identify the facilities and transportation routes where hazardous substances are present
- Establish emergency response procedures, including evacuation plans, for dealing with accidental chemical releases
- Set up notification procedures for emergency response personnel
- Establish methods for determining the occurrence and severity of a release and the areas and populations likely to be affected
- Establish ways to notify the public of a release
- Identify the emergency equipment available in the community, including equipment at facilities with hazardous chemicals
- Establish a program and schedules for training local emergency response and medical workers to respond to chemical emergencies
- Establish methods and schedules for conducting exercises or simulations to test elements of the emergency response plan
- Identify a community coordinator and facility coordinators to carry out the plan

The focus of emergency planning is EPA's list of "extremely hazardous substances." This list is made up of more than 400 substances EPA has identified as having immediate toxic health effects and hazardous properties. However, the emergency response plans must address all hazardous materials in the community that present risks to public health and safety, including, for example, widely used fertilizers, preservatives, photographic chemicals, and insecticides.

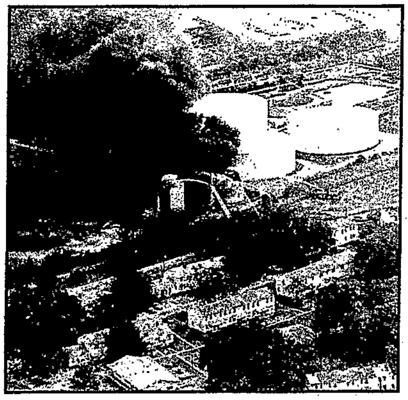
The list of extremely hazardous substances includes a threshold planning quantity for each substance. If at any time this amount or more of the chemical is present at any facility, the owner or operator must notify the SERC and the LEPC. Violators of these reporting provisions are subject to civil penalties of up to $25,000 a day for each day a violation continues.

The facility's owners or operators must also name an employee as facility coordinator. He or she participates in the district's planning process. Obviously, this person is potentially a good resource for journalists.

Federal facilities were originally exempt from EPCRA's requirements. The Bush Administration sought voluntary compliance by federal agencies, but critics said this left too many gaps in coverage. President Clinton made federal compliance mandatory on August 3, 1993, when he signed Executive Order 12856, *Federal Facility Compliance with Right-to-Know and Pollution Prevention Laws*.

LEPCs must make most of their information available to the public. They must let their communities know about their emergency response plans by publishing notices and scheduling public meetings. Their plans must be reviewed annually and updated as needed. LEPCs may be excellent sources of local information for reporters.

Emergency Release Notification (Section 304)



Chemicals covered by this section of the law include not only the 400-plus extremely hazardous substances, but also other hazardous substances subject to the emergency notification requirements of the Comprehensive Environmental Response, Compensation and Liability Act, (CERCLA, also known as Superfund). Some chemicals are on both lists. If a covered substance is released in an accident at a facility or on a transportation route in an amount that exceeds the reportable quantity for the substance, the NRC and the appropriate LEPCs and SERCs must be notified *immediately*. Notification activates emergency plans.

Initial notification of a substance release can be made by telephone, radio, or in person. If the release results from a transportation accident, the transporter can dial 911 or the local telephone operator to report it. All emergency notifications must include—

- The chemical name
- The location of the release
- Whether the chemical is on the extremely hazardous substance list
- How much of the substance was released
- The time and duration of the incident
- Whether the chemical was released into the air, water, soil, or some combination of the three
- Known or anticipated health risks and medical attention necessary
- Proper precautions, such as evacuation
- A contact person

As soon as practical after the release, the facility coordinator must submit a written report to both the LEPC and the SERC. That report must update the original notification and provide additional information about the response actions taken; known or anticipated health risks; and, if appropriate, advice regarding any medical care needed by exposure victims. By law, this information must be available to the public.

Hazardous Chemical Reporting (Sections 311–312)

Under Sections 311 and 312, facilities must report the amounts, locations, and potential effects of hazardous chemicals present above certain specified threshold quantities on their property. This means essentially any hazardous chemicals they use, handle, or store in significant amounts onsite—whether or not these chemicals are released into the environment.

All companies, whether manufacturing or nonmanufacturing, are potentially subject to this requirement. They must report this information to the relevant LEPCs, SERCs, and local fire departments. Facilities must report on the hazardous chemicals in two different ways: Material Safety Data Sheets (MSDS) and annual inventories.

Reporting Method One: Material Safety Data Sheets

Under federal laws administered by OSHA, companies are required to keep MSDSs on file for all hazardous chemicals in the workplace. Companies must also make this information available to employees so workers will know about the chemical hazards they are exposed to and be able to take necessary precautions in handling the substances. MSDSs contain information on a chemical's physical properties and health effects and on whether it presents hazards in any of the following categories: immediate (acute) health hazard, delayed (chronic) health hazard, fire hazard, sudden release of pressure hazard, or reactive hazard.

The relevant chemicals are those defined as hazardous chemicals under OSHA's requirements—essentially, any chemical that poses physical or health hazards. As many as 500,000 products can be defined in this way. If hazardous chemicals are present, they must be reported under EPCRA's hazardous chemical reporting provisions.

Facilities must provide new MSDSs when new hazardous chemicals become present at a facility in quantities above the established threshold levels. A revised MSDS must be provided if significant new information is discovered about a chemical. Once submitted to the LEPC, SERC, and local fire department, the MSDS information is available to the public upon request.

Reporting Method Two: Annual Inventories

Companies must also report on hazardous chemicals by submitting annual inventories to their LEPCs, SERCs, and local fire departments under a two-tier system. Under Tier I, a facility must (a) estimate (in ranges) the maximum amount of chemicals present at a facility at any time during the preceding calendar year, (b) provide a range of estimates of the average daily amount of the chemicals present in each chemical category, and (c) provide the general location of hazardous chemicals within the facility.

Tier-II information includes more specific information about each substance, including a brief description of how each chemical is stored and the specific storage locations of hazardous chemicals. (For example: A facility stores 500 pounds of benzene in the northwest corner storage room of the warehouse.) Tier-II reports also must indicate if the reporting facility has withheld location information from disclosure to the public for security reasons, such as protecting against vandalism or arson.

The information reported under Sections 311 and 312 generally must be made available to the public. The public and reporters can gain access the MSDSs and annual inventory reports for particular plants or areas by contacting the LEPC or SERC. The LEPC or SERC must respond within 45 days to written requests for Tier-II information. The state commissions may require additional information under state law. Companies may also provide it directly upon request.

Congress gave companies the choice of filing Tier I or Tier II, unless the SERC, LEPC, or fire department requests Tier-II information. EPA, in its own words, "believes that Tier-II reports provide emergency planners and communities with more useful information, and is encouraging facilities to submit Tier-II forms."

Toxic Chemical Release Reporting and Inventory (Section 313)

The fourth key element of EPCRA is a requirement that certain manufacturing plants report annually on the amounts of extremely hazardous substances they release into the air, water, or soil. This provision applies to more than 31,000 facilities with 10 or more employees. Companies with nine or fewer employees are exempt from Section 313. Toxic chemical release reports are required from facilities that use more than 10,000 pounds of a listed chemical in a calendar year or that manufacture or process more than 25,000 pounds per year.

Many companies have long been required to report data on chemical emissions to EPA and the states under other environmental laws such as the Clean Air Act, the Clean Water Act, and the Resources Conservation and Recovery Act. What makes the annual toxic chemical release reporting requirement different, and particularly useful, is that estimated releases of a specific chemical to air, water, and land appear on one form and that the public and press have direct access to the data.

Facilities must annually file a Toxic Chemical Release Inventory Form (Form R) that estimates the total amount of each chemical they (a) release into the environment (either by accident or as a result of routine plant operations) or (b) transport as waste to another location. A complete Form R must be submitted for each chemical. Releases covered include air emissions from stacks, liquid waste discharged into water, wastes disposed of in landfills, and wastes transported offsite to a public or private waste treatment or disposal facility.

Routine exposure to many of the chemicals covered by this section of the law poses long-term (chronic) health and environmental hazards, such as cancer, nervous system disorders, and reproductive disorders. Among the most commonly used substances included on the list of the approximately 400 chemicals are ammonia, chlorine, copper, lead, methanol, nickel, saccharin, silver, and zinc.

The following information must be estimated and reported by manufacturers for these reports:

- The toxic chemicals released into the environment during the preceding year
- How much of each chemical went into the air, water, and land
- How much of each chemical was transported away from the site of the facility for disposal
- How the chemical wastes were treated onsite
- How efficient that treatment was

These reports must be submitted to EPA and the SERC by July 1 of each year and cover releases in the previous calendar year.

EPCRA set a precedent for increased public access to federal information by requiring EPA to compile these reports into the national computerized TRI database and make it available to the public. EPA originally put the TRI database online in 1989 through the National Library of Medicine's TOXNET. It is now available through EPA's Envirofacts Warehouse, on CD-ROM, and through the RTKNET and Chemical Scorecard Web sites.

Trade Secrets: The One Exception (Section 322)

Under Section 322, companies reporting under EPCRA, under very limited conditions, can request that the specific identity of chemicals in their reports not be disclosed to the public. This section takes a very cautious approach to allowing claims of trade secrecy, requiring that companies state and justify their claims up-front, rather than allowing the claims and then making them subject to challenge after-the-fact.

In addition, Congress specified in the law that a company claiming a trade secret must be able to prove that the withheld information is not subject to disclosure under any other federal or state law and that it is a legitimate trade secret—that disclosure could substantially damage the company's competitive position. The chemical's identity must be included in the company's reports. Furthermore, the organization claiming trade secret protection must demonstrate that it has taken reasonable measures to protect the confidentiality of the information and that it intends to continue taking such measures. Once such a trade secret claim is withheld, information beyond the specific chemical identity will still be available to the public. Information (e.g., about the general category of the chemical) that will disclose the environmental and health effects of the chemical must be included in the public version of the reports, even after a trade secret claim has been approved.

Citizens may challenge a trade secret claim by filing a petition with EPA requesting disclosure of the chemical.

Enforcement Provisions (Section 325)

Companies that fail to comply with EPCRA's key provisions (emergency planning, emergency notification, and reporting requirements) face civil, administrative, and criminal penalties under the Section 325 enforcement provisions of EPCRA.

Violations of the law's emergency planning and emergency response requirements under Sections 302(c) and 303(d) are subject to potential civil penalties of as much as $25,000 daily. Once the accused is given notice and an opportunity for a hearing on the alleged violation, a civil penalty of up to $25,000 can be assessed for a violation of the Section 304 emergency notification requirements. Second and subsequent violations can draw fines of up to $75,000 for each day the violation continues.

Those found guilty of knowingly and willfully failing to provide Section 304 emergency notification reports on extremely hazardous substances under EPCRA or hazardous substances under CERCLA released from their facility face penalties, once convicted, face fines of up to $25,000 or imprisonment for up to 2 years. These penalties are doubled for second or subsequent criminal convictions.

Section 325 authorizes civil penalties of up to $25,000 per violation for failure to meet Section 312 or 313 provisions for hazardous chemical inventory release forms. A finding by the EPA administrator that a trade secret claim is insufficient and frivolous can bring an administrative or judicial penalty of $25,000 for each such claim. Also, a person who knowingly and willfully divulges or discloses information entitled to trade secret protection under the law can be fined up to $20,000 or imprisoned for as much as one year.

As is generally true under the environmental statutes, individual citizens have the authority to bring civil suits. They can sue a facility for (a) alleged failure to submit emergency notices, (b) failure to submit an MSDS or list of chemicals under Section 311, (c) failure to complete and submit a Section 312 inventory form, or (d) failure to submit a Section 313 toxic chemical release form.

Chapter 4

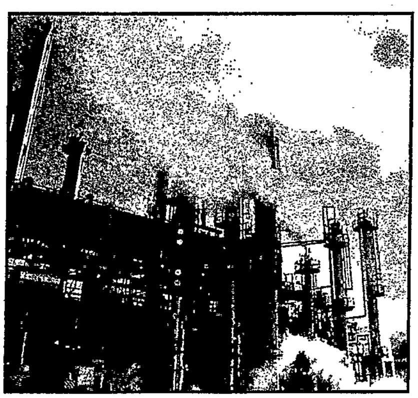
The 1990 Clean Air Act and the Risk Management Program

The next generation of chemical right-to-know was born when Congress passed a comprehensive and long-awaited set of amendments to the Clean Air Act and the president signed them into law on November 15, 1990.

Provisions under the heading of hazardous air pollutants pushed chemical safety in the United States a major evolutionary step forward—moving the emphasis beyond merely reporting hazardous chemical releases to preventing them in the first place. The new programs dovetailed with and added to EPCRA. In fact, these propositions had originally been proposed as part of EPCRA but were not adopted by Congress in 1986.

The CAA created a new Risk Management Program that expanded what facilities (formally known as stationary sources) were required to disclose. It also required facilities to analyze hazards and show what they were doing to reduce hazards. The law created the independent CSB as an aggressive watchdog that not only would do post-mortems on chemical accidents, but would also push EPA and OSHA to reduce hazards. Finally, the law required OSHA to issue rules to ensure the safety of industrial chemical processes.

The risk management program language in the CAA was really only a skeleton of the program, and Congress quite deliberately left it to EPA to fill in most of the details by regulation. EPA took 6 years, until June 1996, to issue the main rule implementing the program. Another 3 years passed before the RMP Rule became effective. And the story is still unfolding. Congress enacted the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act in August 1999 with the primary focus of limiting public access to key right-to-know data collected under the RMP Rule.



Risk Management Program of the Clean Air Act Citations

The CAA Amendments of 1990 were enacted as P.L. 101-549, and chemical accident prevention requirements were codified as 42 U.S.C. 4712(r). The full text of the risk management program is available on EPA's Web site (http://www.epa.gov/swercepp/rules/caaa112r.txt).

The Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act was codified as P.L. 106-40. The law can be downloaded from EPA's Web site (http://www.epa.gov/ceppo/rules/s880.pdf).

The Risk Management Program of the 1990 Clean Air Act: A Summary

The General Duty Clause

The owner or operator of a plant producing, using, handling, or storing hazardous substances has a general duty to design and maintain a safe facility, to prevent accidental releases, and to minimize the consequences of any releases that occur. The duty applies to plants handling any extremely hazardous substance, regardless of whether it is specifically listed by EPA under this law. The general duty clause was intentionally written quite broadly. It requires facilities to know the hazards of the chemicals they use; to maintain a safe workplace by incorporating the industry's best practices, codes, and standards; and to develop an emergency plan. For further information, see EPA's General Duty fact sheet (http://www.epa.gov/swercepp/ap-fabs.htm#fact).

The List of Covered Substances

Under the law, the EPA administrator was required to issue a rule listing at least 100 extremely hazardous substances subject to the requirements of the Risk Management Program. The law specified 16 chemicals required to be on the initial list and specified that the administrator use the list of extremely hazardous substances under EPCRA as a starting point for the RMP Rule list. The administrator can revise the list. Citizens and industry can also petition EPA to revise the list.

In listing substances for the Risk Management Program, the EPA administrator must consider the severity of harm to health that their release could cause, the likelihood of an accidental release, the severity of any acute adverse health effects, and the potential magnitude of human exposure.

On January 31, 1994, EPA promulgated its first version of the regulation and the list of regulated substances and thresholds for "accidental release prevention," often referred to as the List Rule. That regulation identified the substances to be regulated though the Risk Management Program. The first version included three substance categories: toxics, flammables, and explosives.

On June 20, 1996, EPA published modifications to the List Rule, exempting from compliance several types of processes and "stationary sources." All were related to petroleum processing. The List Rule was further modified on August 25, 1997, when EPA published its decision to exempt hydrochloric acid solutions with less than 37% concentrations of hydrogen chloride.

What Is a Process?

A process is defined as manufacturing, sorting, distributing, handling, or using a regulated substance. Chemicals in transit, including pipelines, are excluded.

Responding to concerns raised by regulated industries, the explosives category of substances was exempted when EPA published a revised Final Rule on January 6, 1998. That action also exempted the thresholds of flammable substances in gasoline used as fuel and in naturally occurring hydrocarbon mixtures before initial processing.

On May 21, 1999, one month before the RMP Rule went into effect, EPA Administrator Carol Browner signed a stay of the effective date for facilities with no more than 67,000 pounds of certain hydrocarbon fuels (e.g., propane, butane, ethane) not used as feedstock for a process. This action is particularly significant since more than 40% of the more than 66,000 facilities expected to be regulated under the RMP Rule were now exempted.

The current list of substances and their thresholds is available on EPA's Web site (http://www.epa.gov/ceppo/caalist.html).

Regulations for Accident Prevention

The EPA administrator is authorized to issue regulations for preventing, detecting, and correcting accidental release of listed substances. The regulations may require monitoring; recordkeeping; reporting; training; vapor recovery; secondary containment; and other design, equipment, work practice, and operational requirements. The administrator may set different requirements for different classes of facilities considering factors such as size, location, substances handled, and emergency response capabilities.

The administrator must issue regulations to provide for emergency response to accidental releases by plant operators and owners. EPA must consult with the Departments of Labor and Transportation to minimize potential conflict among regulations. The regulations must cover the use, operation, repair, replacement, and maintenance of equipment used to monitor, detect, and control releases. Regulations must include procedures for training personnel and inspecting plants, and they must cover storage as well as operations. Plants have 3 years after the regulations are issued to comply or 3 years after they begin using a listed substance, whichever is later.

Risk Management Plans

Owners or operators of plants where listed substances are present in quantities above the threshold are required to prepare and carry out RMPs (figure 6). The plans must include the following for each process:

- A hazard assessment of the potential effects of a release that includes estimates of potential release quantities, downwind effects, and exposure of populations; a 5-year history of releases (size, concentration, and duration); and an evaluation of worst-case scenarios
- A program for preventing accidental release of listed substances, including safety precautions, maintenance, monitoring, and employee training
- A program of specific actions to be taken in response to an accidental release to protect human health and the environment, including procedures for (a) informing the public and local HAZMAT responders, (b) emergency health care, and (c) employee training

The law states that the plans "shall be available to the public," except for information qualifying as trade secrets.

EPA can regularly audit, review, and require revisions to ensure RMPs comply with the law. EPA can require the plans to be updated immediately upon any change in the facility's processes. Otherwise, the update cycle is every 5 years. States, territories, tribes, and local governments may adopt chemical risk management requirements in addition to the EPA program. However, these requirements cannot be less stringent than those specified under the CAA.

Types of Facilities Regulated by the Risk Management Program Rule

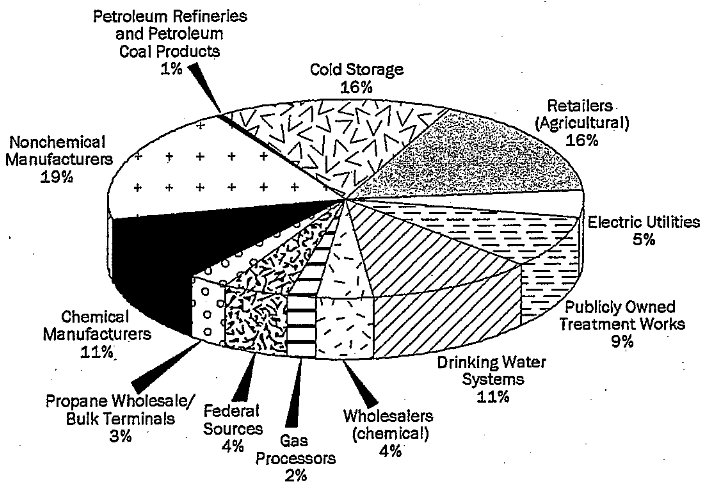


Figure 6: Facilities that have more than specified thresholds of any of the 77 acutely toxic substances or 63 flammable substances must submit an RMP. All of the listed substances can form gas or vapor clouds that may travel offsite and have dangerous consequences if more than the threshold quantity is released. Not all of the covered substances are regulated by EPCRA. Initially, the total estimated number of facilities affected by the Risk Management Program Rule exceeded 66,000. The regulated community was reduced by more than 50% in August 1999 upon the enactment of the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act, which removed flammable fuels (e.g., propane) from the RMP program when used as a fuel or held for sale as fuel at a retail facility.

State and Local Risk Management Program Implementation

States can choose to take delegation of the CAA Risk Management Program. If a state is granted delegation, it then becomes the implementing agency for that jurisdiction. If it does not take delegation, the EPA regional office is the implementing agency. Reporters should contact their SERC or the EPA to determine who is managing the RMP program in their area.

As of January 2000, Florida, Georgia, Puerto Rico, Ohio, the Virgin Islands, and Forsyth County, North Carolina, had obtained delegation. Fourteen other jurisdictions, including California, Kentucky, Louisiana, New Jersey, and Allegheny County, Pennsylvania, were seeking delegation.

The Chemical Safety and Hazard Investigation Board

The law establishes the CSB. The board is independent, that is, not under the jurisdiction of another federal agency. The CSB consists of five members appointed by the president with the approval of the U.S. Senate.

The CSB is fundamentally a research and investigative organization. It has no regulatory authority, with the sole exception of being able to establish requirements for reporting accidental releases. Otherwise, the job of the board is to—

- Investigate, determine, and report to the public the circumstances and causes of any accidental release resulting in death, serious injury, or substantial property damage
- Issue periodic reports with recommendations on how to reduce the likelihood and consequences of accidental releases in chemical production, processing, handling, and storage
- Investigate the potential for hazardous releases, even when they have not yet occurred

The board must submit an annual report to the president and the Congress detailing all accidental chemical releases reported and investigated during the previous year along with any recommendations for legislative or administrative action. To facilitate the board's ability to investigate incidents, its findings and recommendations can *not* be used as evidence in civil damage lawsuits arising out of any matters it investigates.

The OSHA Process Safety Management Standard

In Section 304(a), the CAA mandated another part of a holistic program for preventing hazardous chemical releases. Closely interwoven with the RMP Rule is a regulation issued by OSHA titled *Process Safety Management of Highly Hazardous Chemicals* (29 CFR 1910.119), known as the Process Safety Management (PSM) Standard. OSHA issued the final rule on February 24, 1992. It became effective on May 26, 1992, although portions were stayed until August 26, 1992.

PSM's list of regulated substances (termed highly hazardous chemicals) differs somewhat from those regulated under the RMP Rule. The PSM Rule and the list of highly hazardous chemicals and their thresholds (See appendix A of the standard) can be found on OSHA's Web site (http://www.osha.gov).

Three Levels of Stringency

The RMP Rule divides regulated facilities into three program focuses according to the level of potential danger they may present to surrounding communities. The requirements the rule imposes on facilities become progressively stricter as the danger increases. In the regulatory jargon, these categories are called Program 1, Program 2, and Program 3—with Program 1 being the least dangerous and Program 3 being the most dangerous.

Program 1

Program 1 requirements apply to plants (or processes) that meet three conditions:

- The plant has had no accidental releases in the past 5 years that led to offsite death, injury, or environmental cleanup.
- The worst-case toxic plume or fire hazard would not reach a populated area.
- The plant has coordinated emergency response procedures with local agencies.

Generally, Program 1 facilities are relatively simple operations or are quite distant from the property line.

Facilities with Program 1 processes are required to do little more than document that they qualify for Program 1. They must analyze a worst-case release scenario and document that the danger of injury from toxics and fire will not reach the nearest populated area. They must compile a 5-year accident history showing no serious offsite effects. They must ensure that they have coordinated emergency response plans with local agencies. Then they must certify that they meet the qualifications for Program 1 and that no additional measures are needed to prevent offsite impacts.

Program 2

Program 2 requirements apply to processes that fall into neither Program 1 nor 3. Generally, they are processes of low complexity and do not involve chemical reactions. Program 2 RMP responsibilities include the following:

- Describe how their RMP management systems will be implemented
- Conduct hazard assessments, which includes analyses of worst-case and alternative release scenarios

- Establish emergency response programs that include plans to inform the public and emergency response organizations about the chemicals onsite and their health effects and strategies to coordinate those plans with the community

Unlike Program 1 processes, those in Program 2 must report steps taken to prevent incidents that can release dangerous chemicals. The requirements of the prevention program are less stringent than those for the potentially more dangerous Program 3 processes. Some safety professionals view the Program 2 prevention requirements as a "lite" PSM program.

Program 3

Program 3 requirements apply to processes that do not fall into Program 1 and meet either of two conditions:

- They fall into at least one of nine specified SIC Codes (amended on January 6, 1999, as 10 NAICS Codes). These NAICS codes include pulp mills (32211), petroleum refineries (32411), petrochemical manufacturing (32511), alkalis and chlorine manufacturing (325181), basic inorganic chemical manufacturing (325188), cyclic crude and intermediate manufacturing (325192), basic organic chemical manufacturing (325199), plastics material and resin manufacturing (325211), nitrogenous fertilizer manufacturing (325312), and pesticide and agricultural chemical manufacturing (32532).
- They are subject to OSHA's PSM Standard.

Generally, Program 3 processes pose higher risks and involve complex chemical processing operations. As with Program 2 processes, facilities in Program 3 must (a) describe their systems for managing implementation of their risk management program, (b) conduct hazard assessments, and (c) establish emergency response programs. The prevention program requirements for Program 3 are nearly identical to those of OSHA's PSM Standard. These facilities must conduct a more formal, complex Process Hazard Analysis (PHA).

The Contents of a Risk Management Plan

The Offsite Consequence Analysis

An RMP must contain a hazard assessment, one part of which is an OCA. The OCA estimates what offsite harm to human health or the environment might be caused offsite if a release occurred. Release in this context is a fairly broad term. It could mean a leak of a toxic

What Is an "Endpoint?"

The RMP Rule uses the term endpoint in prescribing how offsite consequences should be performed. Although it is a rather obscure bit of technical jargon, reporters trying to understand an RMP will need to understand the term. Imagine a railroad tank car leaking green chlorine gas and a long plume (cloud) of that lethally toxic gas drifting steadily for miles downwind. A lay person might think of the "endpoint" of that toxic plume as the point at which it is no longer toxic. It's a useful image, although hazard analysts use the term in a sense that is a little more complex.

To say when that chlorine plume ceases to be toxic requires us to make a somewhat arbitrary definition of what we mean by toxic. Let's say, just for illustration, that the plume is toxic as long as it can cause some lasting harm to human health. Toxicologists have determined (with experience, experiments, and lab rats) what concentrations of chlorine (and what human exposures to them) cause lasting harm to human health. That concentration is a number—a number below which some standard human exposure will not result in lasting harm to health. With regard to the OCA, EPA hazard analysts have come to call the numerical value itself an endpoint.

People can and do argue about what the right number is. There are all sorts of standards for choosing it, but that is beside the point here. For the purposes of the RMP Rule, EPA has solved the problem by decree (although not arbitrary decree), setting the endpoints for certain hazards by regulation. The RMP Rule specifies endpoints for flammables, explosion, radiant heat, and a list of specific chemicals (given as concentrations).

So when the RMP Rule speaks of "the distance to a toxic or flammable endpoint for a worst-case release assessment" being "less than the distance to any public receptor," you will be ready to translate for your audience.

gas or liquid, whether sudden or gradual, that drifted or flowed offsite. It could also mean a fire or explosion and the shock wave from the explosion or the heat offsite from the fire onsite.

Facility owners and operators must fully document their offsite consequence analyses and must update them at least every 5 years or within 6 months of a change that would double the distance to endpoint.

Receptors

The regulations define a public receptor as offsite residences; institutions (e.g., schools, hospitals); industrial, commercial, and office buildings; parks; or recreational areas inhabited or occupied by the public at any time without restriction by the stationary source where members of the public could be exposed to toxics. RMPs must estimate at-risk populations, including residential populations; schools; hospitals; and major commercial, office, and industrial buildings.

RMPs must also list "environmental receptors" within these circles—natural areas such as national or state parks, forests, or monuments; officially designated wildlife sanctuaries, preserves, refuges, or areas; and federal wilderness areas.

The Worst-Case Scenario

A worst-case scenario is based on the assumption that if anything can go wrong, it will. Worst-case chemical accidents are the most catastrophic in terms of human death and injury, and they are exactly the kind of accidents planners want to prevent. But they can not be prevented unless they can be imagined. This exercise—so essential for public health and safety—has the paradoxical effect of making people feel very unsafe. That may be healthy if it motivates people to take action to prevent accidents.

This presents something of a challenge to reporters. Catastrophe stories are easy to get on the front page—even imaginary catastrophes. They are very tempting when all that matters is higher ratings and readership. But journalists who think their job is to offer some objective view of reality may want to give readers, listeners, and viewers a sense of the low probability of some of the worst imaginable catastrophes.

Worst-case release scenarios, as called for in the RMP Rule, ask what would happen if everything went wrong all at the same time. They make all the most unfavorable possible assumptions about the conditions under which an accident could occur.

For example, the rule requires analysts to assume that the tank containing a hazardous substance is completely full, that it is released in a very short time (e.g., 10 minutes), and that it is a very hot day (which makes chemicals evaporate or volatilize faster).

Alternative Scenarios

Program 2 and 3 facilities must also analyze alternative scenarios as part of their RMPs. They must analyze at least one alternative scenario for each listed toxic substance and another alternative scenario for flammable substances. They must choose scenarios that are more likely to occur than the worst case and that will still (if possible) pose hazards offsite.

Alternative release scenarios may include far more common, and realistic, failures: split hoses, broken pipe welds or valve seals, spills from overfilled vessels, venting through pressure relief valves, broken shipping containers, and the like. And alternative scenarios may include the affect of process safety features: automatic shut-off valves to stop release and deluge systems to put out fires, for example.

The Five-Year Accident History

The RMP must also include a history of all accidental releases in the previous 5 years that resulted in deaths, injuries, or significant property damage onsite or known offsite deaths, injuries, evacuations, sheltering in place, property damage, or environmental damage.

Events in the accident history of the process may serve as a basis for alternative release scenarios. Unless effective corrective action is taken, history may repeat itself. Investigate whether these contributing conditions, if uncorrected, led to a more serious outcome than the RMP's reported alternative scenarios.

Prevention Programs

While all facilities have a general duty to operate safely, the RMP Rule requires Program 2 and 3 facilities to carry out very specific accidental release prevention programs. The requirements for Programs 2 and 3 are similar in many ways, but they are generally more stringent for Program 3. The prevention program must be documented in the RMP, and where it consists of actions, the RMP will include information about actions to be taken. EPA audits this information, but the overarching strategy of the chemical safety program is one that relies on information (rather than command-and-control regulation) to achieve action. So it is very much incumbent upon reporters and people in communities to examine the prevention program information in the RMPs and ask the right questions about it.

Program 2 and 3 prevention programs are required to include the following:

- Safety Information: Information should include MSDSs; equipment inventory; safety limits for temperatures, pressures, flows, and compositions; equipment specifications; and design codes and standards.
- Hazard Review or Analysis: This review must include identification of the hazards associated with each industrial process, possible equipment malfunctions, or human error that could cause a release, as well as the safeguards needed to manage such malfunctions or errors.

- Operating Procedures: Facility owners and operators must prepare written operating procedures that provide clear instructions for operating each covered process safely.
- Training: Employers at covered facilities must ensure that each employee operating a process is trained and tests competent in the operating procedures.
- Maintenance and Mechanical Integrity: Facility owners or operators must maintain the ongoing integrity of process equipment. This requirement includes setting and carrying out regular maintenance procedures, making sure their own employees and those of contractors are trained in maintaining equipment safely, and maintaining equipment *for* safety.
- Management of Change and Prestartup Review: Program 3 facilities must establish and follow written procedures for changes to chemicals, technology, equipment, procedures, and the plant itself that affect a covered process.
- Compliance Audits: Facility owners or operators must certify that they have evaluated their own compliance with the accident prevention program and the RMP Rule (PSM Standard) at least every 3 years.
- Incident Investigation: Owners or operators must investigate each incident that leads to a catastrophic release within 48 hours of the incident.
- Emergency Response Plans: Program 2 and 3 facilities must have emergency response plans that include procedures for informing the public and local emergency response agencies about accidental releases and documentation of first-aid and medical treatment for accidental exposures.

The Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act

On August 5, 1999, President Clinton signed the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act imposing at least a 1-year moratorium on disclosure of OCA information (sections 2 through 5 of the RMP) concerning potential harm to communities from plants handling hazardous chemicals. The act exempts federal and state Freedom of Information Act disclosures for this period and also exempts rankings of sites based on that data. The act was the culmination of a campaign by the chemical industry and the Federal Bureau of Investigation to limit public access to the OCA data because of concerns about terrorism targeting the most vulnerable communities.

The act also removed flammable fuels (e.g., propane) from the RMP program when the substances are used as fuel or held for sale as fuel at a retail facility. A retail facility is a facility at which more than one-half of the income is obtained from direct sales to end users or at which more than one-half of the fuel sold, by volume, is sold through a cylinder exchange program. The basis for the exemption was that laws and regulations covering flammable fuel and propane dealers are adequate. EPA estimates that the act reduced the number of regulated facilities from more than 60,000 to approximately 30,000.

By August 5, 2000, the federal government must assess the security risks of posting OCA data on the Internet against the benefits of public access to that data. In the meantime, EPA will make all RMP data, including the OCA, available to federal, state, and local officials, including LEPCs, for emergency planning and response purposes. Qualified researchers can also have access to the data. However, EPA has not yet defined who is a qualified researcher. All of these persons are prohibited from publicly releasing OCA data unless the data have already been publicly released by the facility.

Within 180 days of enactment, larger facilities must hold public meetings describing local hazards and provide a summary of their OCA information. The remainder of the RMP data are available on RMP*Info™ and other sources. Much of this information is still important and valuable for investigating local chemical hazards. For example, both RMP*Info™ and RTKNET are publishing the RMP executive summaries. Many of the summaries include the actual worst-case and alternative scenario data that are prohibited from disclosure if it is in sections 2 through 5 of the RMP. Information on chemical facilities, their location, their chemical inventories, and nearby population characteristics is also available. These are the key data elements needed for determining worst-case scenarios.

Chapter 5

Reporting on Chemical Emergency Prevention and Preparedness

Wherever you are, there are probably dozens of good stories waiting to be written on chemical emergencies—before they happen.

The RMPs for individual facilities are an obvious story opportunity. But once you cover the plans, don't presume the story is finished. The RMPs will really be just the beginning of a story. What they leave out may be as important as what they contain. RMPs give the press and the community a chance to ask some really key questions and give companies or facility operators a chance to give some really good answers. Some facilities may provide stories by themselves or there may be stories to write about groups of facilities (for example, farm supply dealers in rural areas).

The information that the RMP Rule requires companies to submit to EPA (and EPA to make public) is only a fraction of the safety analysis companies are actually required to perform. Reporters and citizens have every right to ask companies to make more information public, and companies have a right to say no. How companies respond may itself be informative.

Other sources of information are reports under EPCRA and the OSHA PSM and Hazard Communication Standards. The PSM Standard covers a wider range of flammable and toxic substances than the RMP Rule does. It also covers explosives, which are not covered by the RMP Rule.

Under the PSM Standard, companies are required to give information only to employees, not to the general public. But nothing prevents employees from sharing that information with reporters. You may find that local labor union officials working on occupational safety and health issues are very good sources of information.

Another potential source of stories is information available under air and water permitting programs, hazardous waste handling and cleanup regulations, and hazardous substance transportation regulations. Also, states such as California and Oregon have their own chemical safety requirements.

Looking at Risk Management Plans

After a facility has filed, or "registered," an RMP, you can get the summary information from EPA through RMP*Info™ (http://www.epa.gov/enviro) fairly quickly. Another source for RMP executive summaries is RTKNET (http://www.rtk.net).

Once you get the summary of the RMP, visit your LEPC or SERC and ask them for the complete plan (see chapter 4, page 40 and 41 for some restrictions on what they can distribute). If your LEPC or SERC has no more information than EPA's RMP*Info™, call the company and ask them for the plan. If they are not willing to share it, ask them why not.

Program Classification

One of the very first things you want to look at when you get the RMP information on a facility is how it has classified its regulated processes—as Program 1, 2, or 3. Although most processes are likely to be properly classified, you might want to check the basis for the facility's self-classification.

Hazard Assessment

Accident prevention begins with analyzing operations to identify equipment and procedure failures that could lead to unplanned spills and releases. Ask specifically to see as much as you can about the hazards revealed when the process was evaluated. The RMP Rule requires facilities with Program 3 processes to conduct a PHA. Program 2 processes, which are generally less complex than Program 3 processes, also must identify potential failures, but a formal PHA is not required. PHAs identify areas where improvements can be made in system design, operating procedures, training, and other incident prevention strategies. This is a critical step leading to the OCA. If all the potential hazards are not identified, then the potential effects cannot be analyzed.

Ask who performed the PHA or assessment. Ask what their qualifications are or were. Ask the company to give these people clearance to talk to you. Bring your own experts to review the analysis. The rule requires that the PHA be done by a team with professional competence in this field.

The Offsite Consequence Analysis

Also ask to see the OCA. This is the part of the plan that will probably get the most media attention. It is the part that speaks most directly of potential dangers to people and the part that is most controversial.

The OCA is one of the key tests that determine whether a process qualifies as a Program 1, 2, or 3 process. If the worst-case toxic plume or fire would not reach the nearest populated area, the facility may qualify as Program 1 (See chapter 4, page 35.) Companies will want to qualify for the simpler Program 1 reporting and may have a motivation to minimize reportable hazards. So it is important that the OCA is done correctly.

A more important reason to examine the OCA is that the lives, health, and property of your readers, listeners, or viewers may be at risk. Whether a toxic cloud could reach 5 or 10 miles into a populated neighborhood can mean a great deal to people living in the area.

How do you know whether the OCA is done right? Find some experts to help answer that question. The accuracy of the OCA will depend on certain basics that you can examine. One basic is which chemical is involved and the maximum quantity of it expected to be stored in one place onsite—information reported in the RMP. A second basic is the model that simulates air dispersion of the substance (or fire or explosion). Facilities can use the model under RMP Rule, called RMP*Comp, available on EPA's Web site. They can also use the lookup tables in the RMP guidance. A third basic is the set of assumptions that went into that model (e.g., the temperature of the chemical, how fast it was released and for how long, weather conditions). These are prescribed by the RMP Rule to some degree, particularly for the worst-case scenario. For more discussion of how an OCA works, see chapter 4.

As a local reporter, you probably have special expertise on one key element of the RMP's OCA—the description of the surrounding populations that might be affected by a release, fire, or explosion at the plant. The OCA is supposed to contain a description of these populations. Check its accuracy and completeness. Is the population estimate within the circle drawn around the plant accurate? Are any schools, nursing homes, or other vulnerable facilities left out? Are office buildings or shopping malls found nearby? Could the area be evacuated quickly?

The Five-Year Accident History

Another key element of the RMP is the 5-year accident history. To qualify for Program 1, a facility must have had no releases in the last 5 years that led to offsite death, injury, or environmental cleanup. The accident history can tell you a lot about the potential dangers a plant poses. If the history in the RMP is accurate, it will check out in interviews with workers, unions, neighbors, and local officials, as well as your own newspaper morgue or database. Also, if incidents have occurred, they may show up in one of the HAZMAT incident databases listed in the reference section on page 109.

Multiple Processes in One Facility

Most of the RMP requirements apply not to the plant itself, but to one or more processes within the plant. OSHA defines (and the RMP Rule accepts) a process as

> any activity or combination of activities including any use, storage, manufacturing, handling or the onsite movement of highly hazardous chemicals. A process includes any group of vessels that are interconnected and separate vessels located such that a highly hazardous chemical could be involved in a potential release.

While a fertilizer dealer may have only one regulated process, a large chemical plant may have dozens of processes. It is important to look systematically at all of the regulated processes within a plant, because any one could prove hazardous.

Natural Hazards

Consider what natural hazards might cause or add to dangers at your local plant. Some natural hazards are probably more likely to occur in your area. Is the plant near an earthquake fault? Pipes or tanks ruptured by a minor quake could be a major problem. Is it located on a flood plain? Propane tanks floated away by floodwaters are a common hazard (they need to be securely anchored). Lightning is a fairly common cause of fires, explosions, and releases. Has your plant taken measures to arrest lightning in vulnerable areas? Hurricanes, tornadoes, flood, drought, heat, and cold are among the other natural hazards to consider.

Power Supply and Computer/Communications Systems

Ask about the computer systems controlling the processes. Especially when hazards are involved, the systems they control should be designed to be fault-tolerant. That is, if the computer crashes or makes a mistake, the system should naturally revert to a safe condition. Think of the "dead man's throttle" on a locomotive. If the computers controlling valves at your plant fail, will the valves be closed or open? How old is the computer hardware controlling safety-critical systems at the plant? Has the software been updated recently to reflect new knowledge about safety and how the computer and mechanical systems can fail?

*Consider, too, the possible consequences of the failure of electric power supply or telephone and telecommunication links that support the plant. What safety systems depend on electric power? For example, does the plant store liquids that remain safe only when refrigerated? Is there backup power for refrigeration? If a chemical accident does occur, the plant may well rely on telephones to call for emergency help or to warn the community. What happens if an explosion knocks out the phone lines? How well are backup systems maintained, and how often are they tested? Hazard analysis is supposed to include such considerations. Has it?

Accidents Waiting to Happen by U.S. Public Interest Research Group (USPIRG) and *Y2K Readiness of Small and Medium Size Enterprises* by the Mary Kay O'Connor Process Safety Center at Texas A & M University are two recent studies that analyze the potential relationship between computer problems and hazardous chemical releases. *Accidents Waiting to Happen* can be downloaded at no charge from USPIRG (http://www.pirg.org/chemical). *Y2K Readiness of Small and Medium Size Enterprises* can be downloaded at no charge (http://process-safety.tamu.edu).

The Prevention Program

Probably the most important part of the RMP is not the account of what could go wrong, but the account of what is being done to keep it from going wrong (figure 7). While hardly the most exciting part of the document, prevention may be the part where journalistic and public scrutiny is most needed. The RMP Rule and the PSM Standard require facilities to prepare, document, and carry out an accidental release prevention program that includes the hazard review described earlier. Facilities must also compile an array of safety information that includes MSDSs, equipment inventory, safety limits for operating conditions, and many other things.

As with other parts of the RMP, facilities are not legally required to show you the full information. But if they are doing a good job at accident prevention, they should be proud and eager to share this information with the press. Facilities are, however, required to share the information with employees. So if the company denies you information, you may be able to get it from employees.

Even the information that is publicly available can give you a handle. It can lead to questions about whether the company is following through on its prevention program. Many of the prevention programs have existed for some time because they are required under the PSM Standard.

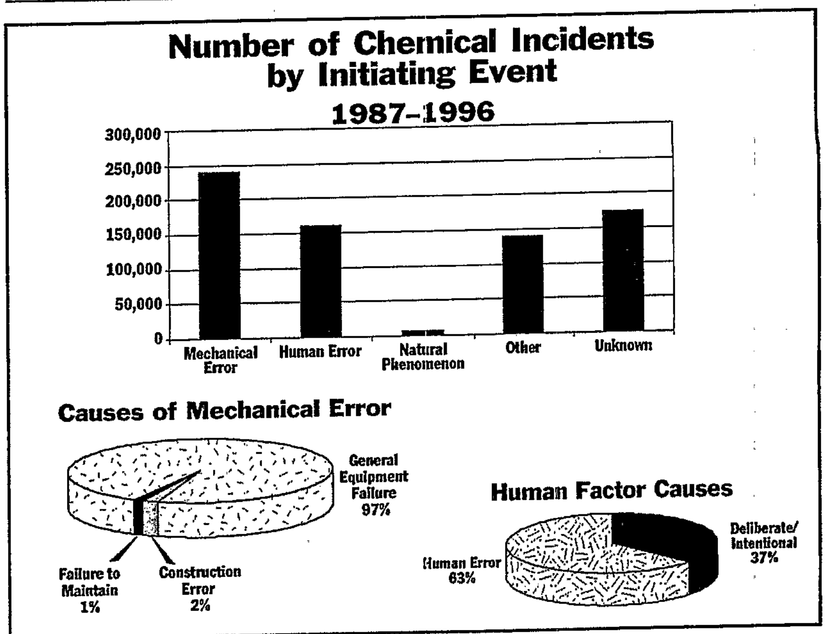


Figure 7: Human and mechanical errors are the major causes of spills and releases. Accident prevention programs should seek to identify problem areas and resolve them.

RMP Versus LEPC Emergency Plans

A very handy tool in evaluating your local plant's safety and its RMP is the emergency plan developed by your LEPC under EPCRA. Conversely, the RMP may help you evaluate the local emergency plan. Is the information consistent? Are there hazards and risks mentioned in one but missing from the other? If an emergency occurs at the plant, will the plant's operators be effective in coordinating with community institutions that need to respond? Is your LEPC updating its plans in light of new RMPs?

Looking for Prevention Measures Beyond those Required

A good accident prevention program may well include elements not required by law. Look for these. Ask the company if it has looked for other opportunities to improve safety and implement changes.

Environmental groups often emphasize that the intrinsic safety of an operation can be improved by fundamental design changes (e.g., switching to safer chemicals). Drinking water purification plants in many cities use chlorine to disinfect the water, and multiton tanks of chlorine are a serious hazard. Although proper handling makes accidents rare, toxic plumes from a release can injure or kill people miles away. Some cities have substituted sodium hypochlorite for chlorine, because it is intrinsically much safer. Sodium hypochlorite is the ingredient in old-fashioned laundry bleach.

Engineers may be able to find many other ways to build in safety. In some cases, companies can reduce risk by limiting their inventory of hazardous chemicals to the supply they will use quickly, rather than storing large quantities. Some chemicals can be handled at pressures closer to atmospheric pressure, thus reducing the speed of release if a leak occurs. Also, some chemicals can be handled at temperatures closer to the surrounding outdoor temperatures so that refrigeration failures need not raise the danger of a release. Ask independent process safety engineers what opportunities to reduce risk may exist. Ask the company if it has looked for such opportunities or carried out such changes.

Writing a Story: Questions to Consider

Questions for Plant Managers

- How dangerous are the chemicals you reported under the RMP? How toxic, flammable, or explosive are these chemicals?
- Have toxicity or exposure studies been conducted on these chemicals? Have credible scientists verified these studies?
- How reactive are these chemicals to water, heat, or other substances? Could this reactivity result in an explosion or create another dangerous chemical?
- What are you doing to reduce hazards (for example, reducing chemical inventories; substituting less hazardous chemicals; improving process design, training, or management controls)?
- What is the scope of chemical safety and emergency response training for employees and contractors? How do you know the training has been effective?
- Who is in charge of safety? What are their names and duties?
- How often does the facility conduct emergency response drills? When was the most recent one? How did it go? What was learned?
- If a release occurred, how would it be detected and who would be notified?
- Does the facility have warning sirens or other mechanisms to alert the community of dangerous releases? Do workers and neighbors recognize them? When was the last time they were tested?

- Were accident prevention and emergency plans developed internally, or was outside help used? Does the facility use internal audits or independent, third-party checks to evaluate the adequacy of the accident prevention program?
- What air dispersion model was used? If not RMP*Comp, why not? How were scenarios derived? What were the assumptions?
- Describe some of the routine steps taken to ensure safety. Describe the steps taken to maintain equipment and operate it safely.
- Does the facility send a representative to the community's LEPC meetings? If so, who? What other efforts have been made to coordinate with the community about safety and emergency response?
- What worries the plant manager and employees the most about safety at the facility? Why?
- If the facility is a chemical manufacturer involved in Responsible Care® (a safety program developed by the Chemical Manufacturers Association), ask engineers at a plant to describe the codes of practice and to give examples of how these practices are implemented.

Questions for the LEPC

- Who is on the LEPC? How often does it meet?
- Does the LEPC have information on hazardous chemical inventories throughout the community available for review?
- Have vulnerable populations (e.g., schools, nursing homes, hospitals, residences) been identified?
- Has the LEPC prepared and kept current site-specific emergency response plans?
- Has the LEPC conducted drills and exercises?
- Has the LEPC developed and communicated evacuation or shelter-in-place strategies?
- Have hazard analyses been integrated into fire and police response plans?
- Does the LEPC have documents of chemicals onsite from EPCRA, RMP, and other regulatory filings? Are the documents consistent?
- How does the RMP worst-case scenario compare to the worst-case scenario developed by the LEPC?
- Have the LEPC's emergency plans been implemented?

- *Who would decide* on an evacuate or shelter-in-place alert? How would the community be notified?

Questions Beyond the RMP

Preventing chemical accidents and preparing for them goes way beyond the RMP. Reporters trying to give their communities a holistic picture of chemical risks and what the community can do to reduce them might well look at a number of other questions:

- What dangerous chemicals do you have onsite that are not listed in the RMP regulation? Can you supply an MSDS or other chemical hazard information?
- Are any new hazardous chemical facilities (or expansions of existing ones) being planned for your community? If so, how close are they located to vulnerable populations?
- What do the zoning laws in your community say about the siting of hazardous materials facilities in relation to populated areas? What decisions is your zoning board making about HAZMAT facilities?
- What do local zoning laws say about siting schools, daycare, hospitals, nursing homes, and the like near hazardous materials facilities? What decisions is your zoning board making?
- Have other community institutions done what *they* need to do to prepare for a chemical emergency at a specific plant? Do schools, nursing homes, daycare centers, or prisons have shelter-in-place drills and evacuation plans? Do hospitals, clinics, and trauma centers have the capacity to deal with casualties from a large accident? Have highway and traffic authorities taken steps to ensure bottlenecks don't impede evacuation?
- How does the information in the RMP stack up against other measures of a facility's environmental performance? How does the RMP information compare to information submitted under EPCRA? How does the RMP compare to what you know about the facility's production and use of raw materials? To its air and water discharge permits? To its shipments of hazardous wastes under the Resource Conservation and Recovery Act or releases of hazardous materials under CERCLA?

Questions to Answer for Citizens

Experts say that when citizens learn about hazardous chemicals used near them, they most want answers to questions such as the following:

- What are the health effects of hazardous substances at the site?
- Are community injuries or deaths likely from this site's hazards?
- How does it affect the environment?
- Is the facility addressing this potential risk?
- Can alternative chemicals be used?
- Are community planners and responders aware of the facility's emergency response plans?
- How can I independently verify this chemical risk information?
- Is the facility reducing, eliminating, and preventing possible hazards?

Chapter 6

When the Siren Sounds: Reporting on a Chemical Emergency

This chapter highlights a few things reporters should consider when reporting on a chemical emergency—before heading to the site, at the site, and after the event.

Even before an emergency, it is a good idea to compile a list of the names and phone numbers you are likely to need in case of a chemical emergency. The list could include the members of the LEPC, the chief of your local HAZMAT team, the chief of the fire department, the director of the local emergency management office, the press and chemical emergency contacts for major local facilities, local university chemical engineers and toxicologists, the chair of the SERC, and the emergency contact at the EPA regional office.

You may find contact names and numbers in the LEPC's emergency response plan, TRI, or the local facilities' RMPs. A contact and referral guide is also included on the National Safety Council's Crossroads Web site (http://www.crossroads.nsc.org). Also check EPA's Web site (http://www.epa.gov/ceppo). If you have a radio scanner, try finding out what frequencies local HAZMAT responders use, not only for dispatch but also for operations.

Understanding the existing chemical hazards in your community and facility and community emergency preparedness (discussed in chapter 5) is very helpful when reporting on an emergency. This knowledge, for example, will allow you to be aware of the possible risks, the populations at risk, and the community's and the facility's emergency response plans ahead of time, which can make reporting more efficient and effective.

Preparation Before Heading for the Emergency Site

Before you head to an emergency site, have a copy of the LEPC's emergency plan and the facility's RMP (if it filed one), including its OCA and emergency response plan. Have hazards at the facility had been identified? Did the LEPC identify this plant as a potential hazard? Did the plant notify the LEPC of its use or storage of hazardous substances? Did it file a Tier-II form? Has a vulnerability

zone around the facility been identified? Was the LEPC aware of the presence of the affected chemicals at the facility?

Take with you a list of the names and phone numbers of people you may need to contact (e.g., LEPC members, local HAZMAT responders, facility spokespeople, and chemical emergency contacts).

A Reporter's Safety Checklist

A critical point to keep in mind is that the very aspect of the event that makes it newsworthy—the sudden and uncontrolled release of hazardous chemicals—may make it a risk for reporters covering the story. You do yourself and your readers, listeners, and viewers no favors if you become involved in the story and suffer adverse health effects that either diminish your ability to cover the story or delay the cleanup efforts under way.

- DO NOT GO INTO THE "HOT ZONES." Hot zones contaminated with hazardous materials present health risks to reporters just like other people. Also, transgressing those borders can be dangerous to official response personnel whose full attention during such an emergency should be focused on the response and cleanup.
- Upon reaching the scene, find the designated emergency response officials who are responsible for dealing with news media while emergency response actions are underway. Many facilities will have spokespersons and meeting areas specifically for the media.
- Be aware that electronic equipment, such as cameras and recorders, can be damaged by hazardous materials and can cause sparks that could worsen the situation.

Questions to Ask at the Site

The Particular Chemicals and the Release

- What chemical or chemicals were involved in the incident? How much was released? When did the release occur?
- Is it a gas, a liquid, or a solid?

- At what temperature was it released?
- Where on the property was it released?
- How fast is the chemical likely to travel offsite? How fast will it disperse? Where is it likely to go?
- Is the chemical reactive? When mixed with other materials, will it become more volatile or hazardous?

Meteorological Factors

- What are the current temperature, humidity, and wind conditions? Are they considered favorable or unfavorable as they affect the spread of the chemical?
- What is the short-term forecast for changes in the weather? How will it affect the chemical?

Physical Surroundings and the Community

- What is the nature of the area—is the terrain flat or hilly, wooded or open, rural or developed? How might the physical environment affect the seriousness of the incident?
- How close are the nearest residences or businesses? Are population centers nearby that might be particularly vulnerable such as schools, hospitals, nursing homes, prisons, or shopping centers? Have they been notified of the release?
- Are nearby residents being instructed to evacuate or shelter-in-place? What are the criteria for deciding?
- What key infrastructure facilities (e.g., water supply, sewer, power, police, transportation routes) might be affected by the incident?

Health Risks

- What are the potential health effects of the chemicals involved? How do health risks relate to the duration of exposure? Route of exposure? Concentrations?
- By what routes are humans exposed to the chemical? Is it inhaled? Is it absorbed through the skin? How do those routes of exposure relate to potential health effects?
- Would adverse human health effects from the chemical be made worse by exposure to a different chemical at the same time?

Protecting the Public: Shelter-in-Place Versus Evacuation

There are two basic ways to protect the public in the event of a chemical release into the air: evacuation away from the toxic cloud or sheltering in a protected area. Emergency management professionals generally agree that evacuation is more effective—if time allows. Because time is often not available, however, other options need to be considered to protect populations in areas around facilities with hazardous chemicals.

Shelter-in-place is simple in concept; it takes advantage of the inherent protection provided by buildings to limit people's exposure to toxic gases in a chemical release. The critical factors in the effectiveness of sheltering-in-place are how long the building is exposed to the toxic gas and how quickly the toxic material gets to where people are in the building. Several analyses have shown that in-place protection can be effective for up to several hours, depending on the "tightness" of the place used as a shelter. A few simple steps, such as turning off heating and air-conditioning, closing windows, and going to an interior room can significantly limit exposure. More extensive efforts could include sealing an interior room with tape and plastic.

Even with these efforts, as a cloud of gas from a chemical accident surrounds a building, some of the toxic gas will begin to seep into the air within the structure. If the toxic cloud remains long enough, the toxic concentration within the building will eventually reach a dangerous level.

Shelter-in-place and evacuation both require that the public take some action to be effective. For either to work, the public must (a) believe that the action will be effective, (b) understand how to carry out the action, and (c) be capable of doing so. Some research shows that people are more likely to follow evacuation instructions than shelter-in-place instructions.

John Sorenson and Barbara Vogt (1999), of Oak Ridge National Laboratory, analyzed public response to a recent chemical emergency in Arkansas. People in part of the affected area were instructed to evacuate while people in another part of the affected area were instructed to shelter-in-place. Those in the evacuation area generally did as they had been instructed. However, a significant number of people who were instructed to shelter-in-place also evacuated.

Similarly, in Deer Park, Texas, where industry and local authorities have actively promoted shelter-in-place over evacuation for more than 5 years, a 1995 survey of Deer Park residents indicated that more than one in five said they would probably evacuate if warned of a chemical emergency (Heath et al., 1995).

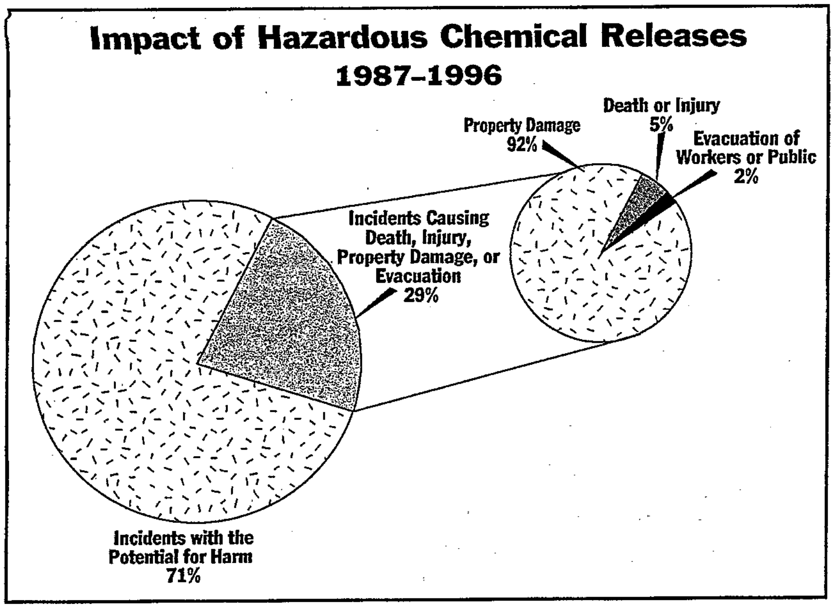


Figure 8: The CSB found that approximately 605,000 hazardous chemical releases were reported from 1987 through 1996. Of the more than 600,000 incidents that occurred during this 10-year period, about 29% resulted in at least one death or injury (9,705 incidents), evacuation of workers or the public (4,167 incidents), or property damage (164,082 incidents). (CSB 1999)

Questions to Ask After the Event

Follow-Up Questions

- How many people were injured or killed? How many were employees? What is the nature of any injuries? (See figure 8.)
- How did the incident happen (e.g., negligence, poor safety procedures, storage conditions, act of nature)?
- What is the safety record of the facility involved (look at the 5-year accident history in its RMP, if it submitted one)? What about the record of its parent company?
- How was the incident cleaned up? How long did the cleanup take?
- How was the surrounding environment affected?
- Have similar incidents occurred in the area?
- What active (e.g., sprinklers) or passive (e.g., dikes) mitigation devices were in place?

- Was the facility required to report the incident under any federal legislation such as EPCRA, RMP, Spill Prevention Control and Countermeasures Plan Rule (40 CFR 112), or the PSM Standard? Under state or local regulations? Is it in compliance with these regulations?
- Did the facility have an emergency response plan? Did the plan work during the emergency?
- Had the facility defined a vulnerable zone? If so, how did this zone compare with the actual area affected?
- What chemical safety and emergency response training does the facility provide to its employees and contractors?
- What routes are used by the facility to ship and transfer its hazardous materials?
- If the incident involved a storage area, were the storage conditions adequate?
- Was the facility aware of the risk of an emergency? Was it identified in the RMP?
- Did the facility have equipment onsite to detect a release?
- Was emergency medical care available onsite?
- Are there any possible substitutes for the chemical released? What are the environmental and health issues posed by substitutes? What are the economic issues involved in using substitutes?

Questions for the LEPC

- Had the LEPC identified the facility as a possible hazard?
- Had the LEPC determined the potential vulnerable zone around the facility due to the chemicals stored onsite?
- Did the LEPC have an emergency response plan? Did it work during the emergency?

Questions for Emergency Response Officials

- Which emergency response teams responded to the incident and why?
- How did response personnel respond to the incident?
- Were they trained in hazardous materials response procedures? If not, why not?

Chapter 7

Reporting on Routine Chemical Releases

In addition to information on accidental releases potentially resulting in emergency situations, TRI includes information on routine, planned releases of chemicals. A number of organizations have drawn up suggested questions about routine releases based on the Section 313 TRI reports.

The following are some questions based on suggested questions from the Natural Resources Defense Council, a national environmental membership organization:

- What percentage of the total reported releases is routine? What percentage is accidental?
- What is the basis of the emissions estimate? Actual measurements provide the most accurate information. When and for what chemicals were they performed?
- Has the industry measured or estimated human exposure to the chemicals?
- Are there air or water monitors? Are they located downwind or downstream of the disposal locations? How far are they from the point of release? How often do the monitors collect the samples?
- What concentrations of the chemical have been detected? Is the chemical harmful in that volume? Which substances disperse or degrade?
- What are the environmental and health effects of the chemicals released? Are health effects long term (chronic) or short term (acute)?
- What health effects has the particular chemical been tested for? What health effects have not been tested for?
- Is the reported risk for a person with the most exposure or a person with average exposure?

- Do the major sources of the toxic releases within the facility have pollution controls? Are any additional control measures available? If so, have they been installed? If they have not been installed, why not?
- Has the company ever analyzed what can be done to reduce releases?
- Has the company reduced or increased releases from the last year?
- Do federal, state, or local standards regulate the release of these chemicals? What federal, state, or local permits apply to the facility? Is the facility in violation of any of these permits?
- Are there less toxic substitutes that could be used?

Reporters might also consider some questions about what *isn't* available under TRI:

- Has the company kept the identity of any chemical releases secret? If so, why?
- Do other facilities exist in your community that are not covered under TRI but that may be releasing the same chemicals?
- Are there any local facilities that have not filed their required reports?
- What chemicals are released but not covered under TRI?

Activist environmental organizations, of course, are not alone in putting forth questions concerning chemical information. The American Chemical Society poses the following questions for local public health officials to ask. They are questions that in many cases *cannot* be answered based on the information available under EPCRA, but they are questions that might be sparked by the availability of that information:

- Were releases continuous, intermittent, or planned?
- What else is the chemical combined with or in the presence of?
- How often, when, and how are the releases occurring? What were the quantities emitted per day?
- At what height are emissions released?
- At what temperature are emissions released?
- Where on the property did the release occur?
- What is the predominant daily wind direction? Are releases restricted during certain wind or weather conditions?

- *What are the potential* exposure routes (e.g., drinking water, air, surface water) for the community?
- Are the concentrations safe? What is the danger of chemicals detected at low concentrations? What is the source of that information?
- How much of the chemical could be safely breathed or ingested by an individual?
- Is anyone in the community at risk? (LEPCs, using 302, 304, and 311/312 data, may be good sources of perspective on this question.)

Chapter 8

Your Computer as a Reporting Tool

The computer is as important a tool for reporters as the telephone and notepad. Many media outlets hire specialists in computer-assisted reporting. While computer-assisted reporting has grown in popularity as a buzzword, many editors and reporters still don't fully understand its vast potential.

TRI came out shortly after the dawn of the computer-assisted reporting boom. It was one of the earliest and biggest opportunities for reporters specializing in the environmental beat to do computer-assisted reporting. Over the years, it supplied the raw material for a lot of stories, many of them good and some of them great.

Since the advent of the Internet and the World Wide Web, the possibilities for computer-assisted reporting have grown even further. Most reporters now use the Web for basic information gathering, almost as a reference library. This "lookup" function of the Web or computer databases is handy and certainly the most common way databases are used in reporting. Yet it scarcely begins to exploit the possibilities of the computer as an investigative tool.

One of the most useful resources for reporters wanting to explore the computer as an investigative tool is the National Institute of Computer Assisted Reporting (NICAR, http://www.nicar.org), an arm of Investigative Reporters and Editors (IRE). NICAR provides training and maintains a listserve. It also collects useful government databases, puts them into user-friendly formats, and then makes them available to reporters at nominal fees.

Environmental groups have also taken advantage of computer-assisted reporting opportunities. A prominent example is USPIRG, which did a report in November 1996 titled, *Costly Chemical Cover-Up: Anti Right-to-Know PAC Contributions*. It used Federal Election Commission data to examine the relationship between chemical company campaign contributions and congressional opposition to chemical right-to-know laws. Another example is USPIRG's July 1998 report, *Too Close To Home: A Report on Chemical Accident Risks in the United States*. It took available information from TRI and population data and used air-dispersion modeling to calculate worst-case chemical releases for areas all over the United States. EDF's Chemical Scorecard Web site (http://www.scorecard.org) has essentially done the data crunching to make a "local story" on chemical hazards for any place in the United States.

National Databases

The quantity and variety of electronic data available to reporters interested in toxic and hazardous chemical issues have grown over the years. A few of the national databases are described below.

The Toxic Release Inventory

TRI is one of the major national environmental databases, and, because data have been accumulating for more than 10 years, it has become one of the largest. TRI has also become easier to access and use.

TRI is available through EPA's Envirofacts Warehouse (http://epa.gov/enviro). You can query the database to request specific data. You could, for example, ask for complete TRI information on all the reporting facilities within your city. Or you could ask for the names and cities of all the facilities nationwide releasing hydrofluoric acid.

If you have a more ambitious project in mind, or want to have it on your own computer for handy reference, you can also get a copy of the entire TRI database. Most of the historical data are available free in CD form.

RMP*Info™

RMP*Info™ (http://www.epa.gov/enviro) is EPA's database that contains the registration and executive summary information from RMPs submitted by each facility. Facility operators submit their data electronically through Submit™ and then certify it with signed hard copies.

Because of a law passed in August 1999, RMP*Info™ and other electronic databases will not include information on the facilities' worst-case and alternative scenarios, at least not until after August 2000. (See chapter 4, page 40 and 41 for a discussion of restrictions on distribution of the OCA data.)

Envirofacts Warehouse

Envirofacts Warehouse (http://www.epa.gov/enviro), EPA's gateway to most of its online databases (including RMP*Info™ and TRI), is a valuable tool for environmental reporters. Part of its usefulness lies in its comprehensiveness. It includes, for example, databases of wastewater discharge permits and air pollution discharge permits, as well as violations of drinking water standards. The other part of its usefulness lies in the fact that it is geographically focused—you can get lots of data for a particular area.

Chemical Scorecard

Chemical Scorecard (http://www.scorecard.org) is an online interface that publishes EPA databases and other information on hazardous chemicals in the community. It is run by EDF with funding by various foundations. Scorecard heavily emphasizes local impacts, user-friendliness, and citizen action.

RTK Net

RTK Net (http://www.rtknet.org) is operated by the nonprofit OMB Watch and the Unison Institute. It is funded by various government agencies and foundations. RTK Net provides free access to numerous databases, text files, and conferences on the environment, housing, and sustainable development.

Others

Many other databases are available that relate to chemical releases and chemical hazards. A selection is listed on the National Safety Council's Crossroads Web site (http://www.crossroads.nsc.org).

General Project and Story Ideas

Accident History

Each RMP should have a 5-year accident history. To help determine whether it is complete, you can check RMP data against one of the six or more federal accidental release databases in the reference section of the RMP. Of course, you should check human sources too, such as plant employees or local HAZMAT responders.

Federal–State Comparisons

Many states have their own reporting and database requirements, and each is different. Try to confirm EPCRA, RMP, or PSM data against relevant portions of any state database available to you. Inconsistencies may help identify reporting violations or other stories.

Cancer and Disease Incidence

Look for whatever cancer (or other disease) data are available, for example through the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) database (http://www-seer.ims.nci.nih.gov/). Ask your county and state health departments what data they have available. Does disease incidence in your area correlate with toxic releases? To properly understand these questions, you will need the expertise of professional epidemiologists.

Cumulative Exposure

Examine the data for your locality in EPA's Cumulative Exposure Project (http://www.epa.gov/oppecumm/index.htm). This project is examining how much toxic contamination Americans are exposed to cumulatively through air, food, and drinking water. Remember that these are estimates. Local breakdowns are currently available from the Chemical Scorecard Web site and may eventually be available from EPA. TRI data can be used to identify which releases may be responsible for the highest exposures in your locality.

Pollution Database Consistency

Check data on releases and chemical use from TRI and RMP against data from EPA's other pollution databases. EPA's wastewater discharge permits (the Permit Compliance System database), air pollution sources (the Aerometric Information Retrieval System/AIRS Facility Subsystem database), and hazardous waste handling (the Resource Conservation and Recovery Information System database) are obvious starting points. All of these databases can be accessed through EPA Envirofacts (http://www.epa.gov/enviro). Do data from one source suggest that data from another source may be unreported, underreported, or unaccounted for?

OSHA Violations

If there is a particular plant whose releases concern you, you may want to check out any OSHA violations. OSHA's Integrated Management Information System database (http://www.osha.gov/oshstats/) details OSHA plant inspections and whether or not violations were found. Look into any violations involving hazardous chemicals—you may find significant subthreshold or unreported releases or careless practices that could result in releases. You can also get the data from NICAR's database library for a fee.

Chemicals of Concern

One or more major plants in your area may have routine emissions (or potential releases) of particular chemicals that are especially large. TRI and RMPs will help identify them. Are there other sources of the same chemicals (or family of chemicals) that might add to the total exposure? What are the health effects of these chemicals? What are the estimates (if any have been made) of the actual exposures to these chemicals?

Nationwide Company Performance

Your local plant may be one of many owned and operated by a large corporation. Its toxic releases and the hazards it presents to your community may be part of a larger picture of corporate performance. You can use TRI, RMP*Info™, and other databases to try to build a picture of the situation at the company's other plants. Does the company have a good overall safety and pollution record? How does that record compare with those of other companies in the same industrial category?

Local Laws, Programs, and Codes

Explore how local laws and rules take chemical safety into account. For example, what are the provisions in the local fire and building codes that apply to buildings where hazardous chemicals are stored, processed, or used? Are there databases of fire inspections, building permits, or other local regulatory actions? Try matching these with TRI and RMP data.

Mapping Project and Story Ideas

As desktop computers have grown in power during the last decade, enormous advances have been made in the use of maps to organize and display information in databases. Such systems are often called geographic information systems (GIS). A number of GIS databases and software packages have been developed specifically for environmental information.

When EPA began consolidating the user interface to its databases under Envirofacts, it suddenly became possible to easily see how many kinds of environmental information related to a single location. Not only was it possible to see all the air and water pollution dischargers in a single town, for example, but it was also possible to further connect such data with local natural resource features or demographics.

A number of map-oriented systems have hazardous chemical data, in addition to Envirofacts. EDF's Chemical Scorecard does perhaps the best job of making data user friendly and community relevant. There are numerous systems for organizing geographical databases. Explaining the complexities of them is beyond the scope of this guidebook, but you can find more information at the Census Bureau's Web site (http://www.census.gov/ftp/pub/geo/www/faq-index.html).

Most systems work by associating data with particular coordinates in two-dimensional geographical space, such as latitude and longitude on a map (a third dimension, altitude, is also common). There are several widely used commercial software products such as ArcView (http//www.esri.com) or MapInfo (http://www.mapinfo.com). Another, developed by the EPA, the National Oceanic and Atmospheric Administration, and the U.S. Census Bureau, is called LandView. LandView is distributed free online (http://www.rtk.net). Further information is available from the U.S. Census Bureau (http://www.census.gov/geo/www/tiger/landview.html).

GIS mapping is a great way to generate graphics that will be meaningful to your audience. Here are some ideas that may get you started on stories.

Map the Footprints

Map offsite footprints of the worst-case and alternative scenarios for all the RMP sites in your community. How would the footprints change if various assumptions were changed? How much of your community is potentially vulnerable to hazardous chemical accidents?

Map Vulnerable People

Use available maps (traditional and digital) to identify the human receptors that might be affected by hazardous chemical releases in your community: schools, hospitals, daycare centers, nursing homes, and the like. People in your newsroom are probably an excellent source of information about such facilities, even if the facilities are not on the maps. How do the human receptors you can identify compare with the ones identified by companies in their RMPs?

Describe Vulnerable Populations

Use Census maps and data to describe the demographics of populations within the "footprint" areas that would be affected by a worst-case accident in the various RMPs. What can you learn about the age, economic level, race or ethnicity, and possibly reproductive status of people who are most vulnerable to accidents?

Map Zoning Restrictions

Compare the vulnerable populations with the zoning maps or "Master Plan" maps (if any exist) for your community. You may be able to layer onto this further data about property taxes or assessments or building permits, depending on what's available. Has there been much recent new development in vulnerable areas? Have facilities such as schools or hospitals been sited in vulnerable areas? Does existing zoning encourage development or siting in vulnerable areas?

Examine Government Programs

Do any federal, state, or local government programs encourage or subsidize siting of housing or vulnerable facilities within high-hazard areas? Is the federal government building low-cost housing within the vulnerable zone? Is the school board building new schools there?

Map Cumulative Exposures

Get the estimate data for your community from EPA's Cumulative Exposure Project. These estimates are made at the census tract level. Use mapping to compare how these data relate to demographics and to TRI releases and RMP footprints.

Map Weather, Climate, and Hydrological Data

Weather, climate, and hydrological data are available from the National Oceanic and Atmospheric Administration and the U.S. Geological Survey. What are the prevailing winds? Are releases upwind of populations? How cold or hot does it get? This affects equipment and process performance and the behavior of hazardous chemicals. Does it rain or snow a lot? Is the area subject to hurricanes, tornadoes, earthquakes, or landslides? Is the facility on or near a flood plain? A groundwater recharge area? The watershed of a drinking water source?

Map Natural Resource Data

Map the data for environmental receptors such as wildlife refuges, parks, forests, critical habitat for endangered species, lakes and streams (especially those used for drinking water, swimming, fishing, or recreation), or other sensitive habitats.

Map Transport Routes

Map routes (road, rail, water, and pipeline) for vehicles involved in transport and disposal of hazardous raw materials, products, and wastes associated with the RMP or TRI facility. How do these routes match up with accident patterns and vulnerable populations?

Some Issues and Cautions

Many of the problems of computer-assisted reporting have nothing to do with hazardous chemicals and everything to do with the computers themselves. These issues are beyond the scope of this book, but information and advice is available from NICAR and other sources. Before you launch a computer-assisted reporting project, it is wise to know what challenges you will face.

Probably two of the key ingredients in a good computer-assisted reporting project are knowing where the data are and being able to ask good questions. This guidebook tries to help you find key sources of chemical hazard data, especially at the federal level. But this book is far from exhaustive, especially when it comes to state and local data. For local and state databases, you may find that a critical step in your project is getting a usable electronic copy of the database you seek. Your state may have open-records and freedom of information laws that will help. But the data will do you no good if it is in a medium or format you cannot read. Also, data can have many errors and inconsistencies that have to be fixed before you can use it.

Close familiarity with the structure and content of available data will help you formulate questions that can be answered with computers. There is no substitute for manually "paging through" the data and eyeballing it to get a feel for it. Are there obvious misspellings? Are there a number of empty fields? If so, do you understand why? Are the data expressed consistently? Are the numbers plausible?

Computers need consistency. Your database may have entries for "Acme Corporation," "Acme Corp.," "Acme Chemical," and "Acme Chemical Specialties Corp." Are these all the same company? It makes a big difference.

In 1999, EPA began several initiatives aimed at standardizing its different databases. The Facility Identification Initiative (http://www.epa.gov/enviro/html/fii/index.html) set a standard that allows most information about facilities in Envirofacts Warehouse to be linked. Another initiative was EPA's Sector Facility Indexing Project (http://es.epa.gov/oeca/sfi/index.html), which offers a fuller profile of selected facilities.

Chapter 9

Deciphering Hazards and Risks

Although effective reporting on controversial public health issues does not require coursework in toxicology and chemistry, some understanding of these subjects is clearly helpful. Understanding a hazard often comes down to knowing the following factors:

- A chemical's health effects
- The concentration of exposure
- The duration of exposure

Terms such as immediately dangerous to life and health (IDLH), emergency response planning guidelines (ERPG), endpoint, risk, distance to endpoint, level of concern, and toxic concentration are tools of the trade for emergency managers in government and industry to describe the health risks associated with hazardous substances in the community.

Hazard Versus Risk

A *hazard* is something that is capable of causing harm. The bigger the hazard, the greater the capacity to cause harm. A chemical hazard is based on properties intrinsic to the material and the level of exposure. Hydrofluoric acid is toxic; propane is flammable. Little can be done to change these characteristics. The severity of the hazard often depends on its concentration and exposure.

Risk is a measure of probability. It refers to the likelihood that an event will occur—the possibility of a release. The greater the risk, the more likely the hazard will cause harm. Ideally, risk should be quantified—for example, a 10% probability that a certain event will occur. Too frequently, however, the data related to rates of equipment failure, human error, and other factors are unavailable, so it is not possible to reliably quantify chemical risk. Nevertheless, we know from experience that incidents happen more frequently during some events, such as transfer operations or process startups.

RMPs only provide information on the potential impacts of a chemical release (hazard), not the likelihood it will happen (risk).

Case Study: Chemical Release Incidents and Community Reaction

The Richmond County School Board in Augusta, Georgia, was accused by some of courting disaster by building a $20 million high school 670 yards from two large chemical plants. Others in the community were not concerned.

In July 1998, EPA presented incident modeling data showing that the planned site for the high school was inappropriate because of its proximity to the Rutgers Organics and Amoco Polymers facilities, which used large amounts of hazardous chemicals. Richmond County Emergency Management Director Pam Tucker requested the EPA report. EPA's projected accident scenarios foreshadowed the real thing.

On November 17 and 20, 1998, according to reports from the *Augusta Chronicle*, General Chemical Corporation in Augusta, Georgia, accidentally released sulfur trioxide, which becomes deadly sulfuric acid when it comes in contact with moisture. The first General Chemical incident sent 51 people in the community to area hospitals complaining of eye and lung irritation. The release occurred at 2:35 P.M., while students were in school. Students and teachers at two schools, an elementary and a middle school, located less than 2 miles away, were affected. The elementary school had a shelter-in-place program, but it received no warning of the November 17th release. There was a 2-hour delay between the release and notification of emergency personnel.

Three days after the first release, the facility released a cloud of sulfur dioxide gas as part of a planned process. However, the weather conditions kept the cloud from dispersing as expected. Exposure to the cloud forced 39 workers at an adjacent facility to seek medical treatment for symptoms that included shortness of breath; burning and irritation of the eyes, nose, and throat; and nausea and vomiting.

A November 19th *Augusta Chronicle* story provides a concerned parent's assessment of the first accident. "That's exactly the type of thing we're concerned about," stated Dietrich Dellerich, a member of Citizens for Fair Schooling. "We're concerned about all of the schools near chemical plants, but to put a $20 million investment under one of the plants is ludicrous. I hope and pray nothing ever happens near the new school, but you can't eliminate human error. You have to eliminate the risk."

But other Augusta citizens believe they can live with these risks, the *Chronicle* reported. The school board approved the high school's construction. Seven schools, including the middle school and elementary school affected by the November releases, are already located less than 2 miles from an area of Richmond County with a significant concentration of chemical plants.

Deputy School Superintendent Gene Sullivan is one of those who view worry as needless. He was quoted in a December 12, 1998, *Augusta Chronicle* story as saying, "The area is booming; people are buying and building homes there. We keep harping on this issue. If it's such a scary area, why are people continuing to live and move there? We are building the school where the people live."

This case illustrates how information from a facility's RMP could be perceived in different ways and could affect community decision making.

Conditions and Factors Affecting Chemical Hazards

Chemical Reactions

The first step in recognizing a hazard is to identify the chemical or chemicals that could be released. Identification is relatively simple when a pure material or refined, final products are involved. But identification can be more difficult if the release could occur while mixtures are reacting and several raw materials or reaction products are involved. For example, because the two Augusta incidents (see sidebar) occurred at different stages in the same chemical process, different chemicals were released by the two events.

In addition, the reaction of released chemicals to other materials in the environment may make it difficult to identify resulting hazards. For example, sulfur trioxide reacts with humidity and other water sources to create sulfuric acid. Although the RMP Rule does not regulate sulfuric acid, it does have corrosive properties that make it dangerous.

Amount, Rate, and Duration of Release

The amount and duration of a chemical release can affect the size of the area subject to the hazard, so it is often important to be able to identify how much material is released for how long. The concentration of the chemical in a cloud is also influenced by (a) the rate at which the release occurs, (b) the size of the area from which a liquid spill can evaporate, and (c) its temperature. Government representatives questioned the Augusta chemical plant's initial report of the quantity and duration of the sulfur trioxide release because a larger-than-predicted area was affected. However, federal investigators found no evidence to contradict the reported release.

This example demonstrates that predictions may not always be reliable.

Weather Conditions

Variation in the weather conditions under which toxic chemicals are released can affect the extent of a hazard. Higher temperatures and less wind generally lead to a greater hazard. The sulfur dioxide release in Augusta in 1998 demonstrates some of the difficulties in recognizing and predicting hazards, because it was an expected and permissible startup release. Although this type of release normally dissipates quickly without impact, weather conditions on that day caused the vapor cloud to settle on the ground, creating a hazard that sent 39 people for medical treatment.

Physical State

The physical state of a substance—solid, liquid, or gas—affects its ability to spread after it is released into the environment (table 1). All of the chemicals regulated by the RMP Rule are either gases or liquids that evaporate quickly. Unlike solids, volatile liquids and gases can readily create large chemical clouds that can move offsite. This is what happened in the Augusta incidents. Sulfur trioxide is a volatile liquid, and because it can evaporate rapidly, it formed a dense vapor cloud that affected people several miles away.

Gas clouds stop forming when the leak is stopped; however, liquids can continue to form a cloud after the leak has stopped. Without the means to control the spill, liquids can continue to evaporate, increasing the length of time a community can be exposed to its vapors and increasing the hazard. The faster a liquid evaporates, the more concentrated its vapor cloud may become. The higher the concentrations of chemical, the greater the hazard.

Flammable Chemicals

Clouds of flammable gases or vapors are dangerous because they may result in one or more of several outcomes:

- Vapor cloud fire (flash fire)
- Vapor cloud explosion (a more violent flash fire)
- Pool fire (burning of large puddles)
- Jet fire (pressurized gas or liquid escaping from a hole)
- Boiling liquid, expanding vapor explosion (BLEVE) (an explosive release of expanding vapor and boiling liquid following the catastrophic failure of a pressurized vessel holding a liquefied gas, such as propane)

Table 1: Summary of Hazardous Substances Properties

Property	Influence(s)
Physical State	The physical state of the substance affects its ability to move after it is released into the environment. Gas clouds stop forming when the leak is stopped. Liquids can continue to form a cloud after the leak has stopped, increasing exposure time.
Vapor Pressure	The higher the vapor pressure, the faster the chemical evaporates and the more concentrated a vapor cloud may become.
Density	Heavy gases tend to create a larger hazard. They tend to settle at ground level, increasing their contact with living things.

Explosions can cause powerful shock waves that may directly cause injuries and property damage. Shrapnel and structural damage created by the blast may result in additional injuries.

Fires resulting from chemical releases generally do not have an offsite effect; they are typically confined to the property where the incident occurs. Sites with the potential for large fires often establish distance between the manufacturing processes that handle flammable materials and the end of the property line. That distance usually prevents fires from spreading offsite. The heat radiating from a fire may be more likely to cause injuries and property damage in the nearby community.

Vapor Pressure

The vapor pressure value is an index of how quickly a liquid will evaporate (table 1). The higher the value, the faster the chemical evaporates. Most toxic liquids regulated by the RMP Rule have a vapor pressure of at least 10 millimeters of mercury (mm Hg) at ambient temperature, usually assumed to be 68° Fahrenheit. As a point of reference, the vapor pressure of water is 23 mm Hg. Sulfur trioxide has a vapor pressure of 344 mm Hg at ambient temperature, indicating that it can quickly evaporate and create a dense vapor cloud. Only two regulated toxic substances (toluene 2,6 diisocyanate and toluene diisocyanate) have a vapor pressure less than 10 mm Hg.

Density

Another important property is the density of the gas or vapor (table 1). Many gases regulated by the RMP Rule are called heavy or dense gases because they are heavier than air. Heavy gases create a greater hazard because they tend to settle at ground level, increasing their contact with living things. Air has a density of 1; sulfur dioxide, a heavy gas, has a vapor density equal to 2.26. High humidity at the time of the November 20, 1998, release in Augusta helped to trap the sulfur dioxide gas, allowing it to settle and injure workers before it could be diluted and swept away by the wind.

The RMP Rule also regulates some neutrally buoyant gases. These gases have densities closer to that of air, so they tend to neither float nor sink in the atmosphere. Wind and atmospheric turbulence play a large role in determining the extent to which releases of these chemicals affect communities.

Toxicology for Journalists: How Toxic Is Toxic?

For environmental journalists reporting on a frequently controversial public health issue, a little knowledge of toxicology can go a long way toward better reporting and better understanding and explaining "How toxic is toxic?"

It's not enough for reporters to simply keep in mind the old toxicology saw that "the dose makes the poison." Although true, that point is subject to abuse from those wanting to minimize environmental risks. *Dose* is the quantity of chemical to which an individual is exposed over a given period. Two additional concepts—potency and exposure—are particularly important. Only with an understanding of both of these concepts can the health risks of a given dose be assessed.

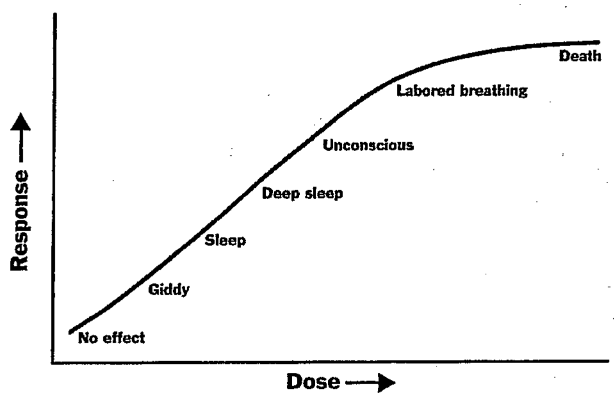
Potency refers to the toxicity of a chemical, that is "the ability of a chemical to do systematic damage to an organism," as the Foundation for American Communications' 1989 *Toxicology Study Guide for Journalists* describes it. Chemicals have potency regardless of whether humans or other living organisms actually come into contact with them. Different chemicals have different potencies. One chemical is more potent than another if a given amount produces a greater adverse health or ecological effect than the same amount of the other. Amounts can be expressed in different terms—as concentrations in the atmosphere or water or in grams ingested per unit of body weight. Once the amounts are expressed in equivalent terms, you can compare potency.

Exposure, on the other hand, refers to whether and how a human or other organism comes into contact with the chemical—usually by eating or drinking it, inhaling it, or touching it and having it penetrate the skin. If there were no exposure, there would be no harm. The amount of risk can vary depending on the nature and duration of the exposure and the concentration of the toxic chemical in question. The human body metabolizes different toxins at different rates, and individual rates vary. When an individual's exposure exceeds the body's ability to metabolize it, the toxin accumulates. When it accumulates to a certain concentration, it can cause injury or death. How and why a chemical affects or does not affect a human body is a function of its particular chemical structure.

Health Effects

Chemicals vary in potency and toxicity. A highly toxic chemical, such as sulfur trioxide, can cause harmful effects from exposure to a small amount in a short time. Less toxic chemicals require larger doses or longer exposure times to cause effects. Michigan State University toxicologists Alice Marczewski and Michael Kamrin (1987), with the Center for Environmental Toxicology, write that "Every chemical is toxic at a high enough dose. The dose of a chemical plays a major role in determining toxicity. Generally, there is no effect at low doses, but as the dose is increased, a toxic response may occur. The higher the dose, the more severe the toxic response that occurs."

They provide the following graphic to illustrate the dose-response curve for alcohol (ethanol):



Source: Marczewski and Kamrin, 1987

In addition, the susceptibility of an individual to a chemical exposure is also critical in addressing the "How toxic is toxic?" question. Factors such as age, health, nutrition, and medical history can influence an individual's sensitivity to a particular chemical. Previous exposures to toxic chemicals can worsen the effects of subsequent exposures to the same or different chemicals.

If a chemical does not penetrate far into the body, any effect would be local, at the site of contact, rather than systemic or system-wide. Some chemicals with local effects are considered corrosive rather than toxic. On the other hand, if the toxic chemical is absorbed into the bloodstream, it can travel throughout the body and produce systematic toxic effects in the organs most sensitive to the chemical.

Chemicals are acutely toxic when they result in harm after relatively brief, one-time exposures. In these cases, the harm is manifested within minutes or hours of exposure and in areas other than just the site where the chemical first entered the organism.

The chemicals regulated by the RMP Rule are all acutely toxic. They may affect various parts of the body and result in several types of health effects. For example, sulfur trioxide dissolves readily in water, creating a corrosive solution of sulfuric acid. Exposure could result in eye and respiratory irritation, such as that experienced by victims of the Augusta, Georgia, release, or skin and gastrointestinal tract burns.

Acute toxicity is often measured as "LD_{50}" in rats or mice. That means the dose is lethal to 50% of the animals tested. Expressed relative to the test animals' weights to allow for weight differences between animals and humans, a lower LD_{50} means a more acutely toxic chemical. Of course human metabolism is not necessarily the same or similar to that of the test animals, so human sensitivity to the chemical may differ.

Chronic toxicity applies to a chemical's propensity for harming an organism over long periods of time—20 or 30 years in the case of cancers—and as a result of repeated, often low-level, exposures. Less is known about chronic toxicity than about acute toxicity, as testing is time consuming, complex, and expensive. Results are complicated by the need to extrapolate from exceptionally high test doses to doses representative of human exposures.

The specific toxic effects can take various forms. Some chemicals cause tumors in tissues (carcinogenic). Others may lead to gene and chromosomal mutations (mutagenic) or adverse effects on the central nervous system (neurotoxic). Still others may cause reproductive and developmental effects.

In summary, the potential health effects are determined by how much of which toxic chemical an individual is exposed to, how often, or how long a duration and by what means of exposure.

Facility Safety: A Key Risk Factor

The 1998 chemical release incident in Augusta, Georgia, illustrates the way release projection data, like the kind that RMPs include, and media coverage of incidents have informed local citizens. Some people would find the risk in this situation intolerable. Others will choose to live with the risk and insist on better emergency planning from the plants, schools, and emergency response groups.

An important component in determining a community's level of risk is the overall safety of the facility (e.g., its equipment, management practices, worker training, level of commitment to safety). Some ways to begin assessing how safe a facility is follow.

The Past Is Prelude to the Future

To assess top-level commitment to safety, reporters researching a story may want to look at the RMP section that details an organization's 5-year accident history. A history of safety is generally a good predictor of future safety.

Safe Facilities Have Several High-Level Personnel Anticipating and Addressing Chemical Safety Problems

Research conducted by Caron Chess et al. (1992) suggests that top-level managerial commitment to safety increases the likelihood that organizations make improvements as a result of independent safety inspections, accidents, and community input. Chess continues to say that safety and risk management should not be the responsibility of just one person or of too many people. She found that organizations that perform well at risk management assigned several top managers to identify and solve safety problems. In fact, healthy competition developed between the managers, and bad news was more apt to travel upwards: the production manager, safety manager, environmental engineer, vice president for public relations, industrial hygienist, and the human relations manager all wanted to claim credit for identifying and solving problems (Chess et al. 1992).

Budget Allocations Suggest Priorities

Safe facilities invest in proactive safety measures and work to identify safety problems. Instead of waiting for accidents to reveal weaknesses, these facilities conduct routine safety audits, inspections, and emergency drills. They secure multiple, independent safety audits from international, national, and local inspectors. Some companies use monetary rewards to encourage line workers to alert supervisors to safety problems.

Emergency Response Is Built on Strong Industry–Government Working Relationships

For example, before an accidental release (which harmed workers and caused a nearby daycare center to be evacuated) at its facility in West Lafayette, Indiana, Great Lakes Chemical had no representation on the LEPC. After the release, and the adverse publicity resulting from it, company managers began meeting regularly with the LEPC. The company also has sophisticated hazardous materials response equipment it shares with the community.

Safe Facilities Encourage and Learn from Community Input

One company that uses community concern to improve its operations is Sybron Chemicals of Birmingham, New Jersey. In 1988, Sybron released an acrid-smelling substance that caused area firefighters to evacuate citizens. In addition, a plant fire at the company seriously injured two workers. The community became hostile toward the company because of these incidents.

Top management might have reacted by stonewalling. Instead, the company invested money and time in developing systems that used community input to make it safer. The company installed an alert and warning telecommunications system, which can automatically dial Sybron's neighbors in the event of an emergency. The system can also work like a sophisticated answering machine with recorded messages about the plant's status. In addition, callers can leave messages requesting further information.

Safe Facilities Are Situated in Communities with High Safety Standards and Regular Inspection Programs

Communities have the power to insist that those who handle hazardous chemicals do so responsibly. One mechanism for enforcing local safety standards is routine inspections. In large communities like Fairfax, Virginia, the county government routinely inspects and issues operating permits to dry cleaning facilities, printers, newspapers, and other facilities that handle hazardous substances. For example, Steve Dayton, manager of the MBC Reproexpress copy shop in Fairfax, says that when he used anhydrous ammonia to produce blueprints, Fairfax County inspectors visited periodically to ensure that his ammonia tanks were chained to the wall, as local codes required.

In less populated areas, inspection may be more a matter of routine conversations between the emergency authorities like the fire chief and facility managers. Whether inspection is a formal or an informal process, its use should reduce the risks associated with hazardous substances.

Effective and Assertive LEPCs Result in Strong Emergency Management Programs

Another indicator of local government's alertness to its role in preventing chemical accidents is the adequacy of the LEPC. LEPCs should meet regularly to identify trouble spots. LEPCs have significant *authority, if they choose to use it.* They can ask for any information relevant to preventing accidents.

Acceptable risk will vary by community and even location within the community. One community's infrastructure, environment, budget, and regulatory framework might be able to handle certain chemical processes that create intolerable risks in another. A community might believe hazardous substances are used safely within a company's walls but want their LEPC to inquire about the routes used to transport hazardous substances into their areas. For example, delivery routes for hazardous chemicals in mountainous areas add an extra element of risk. In Baton Rouge, Louisiana, the LEPC invites a U.S. Coast Guard representative to meet with its members to help them plan for emergencies involving hazardous chemicals carried by Mississippi River barges.

Safe Facilities Operate in Communities with Alert Local Media

The news media can help communities understand risks and what is being done to minimize them. *Augusta Chronicle* reporter Meghan Gourley, who had access to RMP-like information in 1997, said the biggest obstacle she encountered was that plant managers worried her stories would panic the public.

"The idea is to be up front, but fair," Gourley said. "In no uncertain terms, say [in a story] that worst-case scenarios are practically impossible. Focus on those scenarios that are more likely. Be sure to detail not only the elements of the disaster, but also what steps officials are taking to help prevent the disaster." Gourley recommends asking facility managers many questions.

Safe Facilities Are Concerned About Security

The Federal Bureau of Investigation, EPA, Chemical Manufacturers Association, and Congress believe that chemical facilities are potential terrorist targets. These facilities contain hazardous substances that can cause mass casualties. This belief led to the enactment of the Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act.

To reduce the risk of terrorism, the act limits access to right-to-know information. Nevertheless, the facility remains a security risk, and reporters should inquire about this vulnerability. Key questions include—

- How effectively does the facility secure its perimeter? What are its access policies and controls?
- Can personnel be located and tracked within the facility?

- Does the facility or its parent company have a program in place to safeguard its databases and communications?
- Are there protective buffer zones between chemical operations and neighbors?
- Are hazardous operations fortified against bomb attacks?

Community Reaction

In communities where RMP information has already been reported, citizens generally have reacted by being concerned about their personal safety. They have tended to decide they are willing to live with hazardous chemical risks if facilities can ensure good warning and emergency response systems. Once accidents occur, communities are often less tolerant. The news media can assist both communities and facility managers by helping facilities create awareness and understanding of risk management or risk reduction, instead of just waiting for accidents that harm people.

Tips for Interpreting the Statistics of Risk

Statistical claims associated with chemicals and chemical risks can be complex and even contradictory. *Washington Post* Senior Writer and Columnist Victor Cohn's book (1989), *News & Numbers: A Guide to Reporting Statistical Claims and Controversies in Health and Other Fields* is a valuable tool for reporters covering environmental and other public health issues.

In Chapter 8, "The Statistics of Environment and Risk," Cohn writes,

> the media are typically accused of overstating, needlessly alarming, emphasizing the worst possible case, reporting half-baked and unsupported conclusions, or falsely reassuring. We do them all sometimes. Trying to be objective, perhaps stung by such criticism, we too often write only 'on the one hand, on the other hand' stories—I like to call them, 'he said, she said' stories—without expending any great effort to find the most-credible evidence, the most-reliable statistics, the best-informed, least-prejudiced views, the greatest probabilities.

To Cohn the problem arises because environmental writers function in an arena in that—

- Uncertainty reigns, and data are incomplete, inadequate, or nonexistent.

- *We are told different things by different people*, and distinguished scientists make opposing, even warring, assertions, such as "The hazard is horrendous" and "The hazard is minimal or nonexistent."
- Many people don't worry greatly about driving, using seat belts, drinking, or smoking, while others are often concerned about lesser and less-certain dangers of nuclear power and chemicals in our foods.

Cohn, citing works of others†, points to a few basic facts reporters should try to understand:

- The true complexity of the problem
- The limitations of science
- The limitations of analysis
- The limitations of risk assessment
- The limitations of scientists

Muddling one's way through this morass of uncertainty isn't easy, but Cohn suggests several factors reporters can consider to help identify the "most believable results" and claims.

- *Have the results been successfully repeated?* Reporters should verify that health claims have been successfully repeated and that different studies of different populations at different times show duplicate the results.
- *Have the results been successfully tested using more than one method?* Results should be reevaluated using different mathematical techniques.
- *Do the claims test high for statistical significance?* The probability that the same result could have occurred by chance alone should be small.
- *What is the strength of the statistical claim?* "The greater the odds of an effect, the greater the *strength* of an association," Cohn writes in his book. "If the risk is 10 times as likely—the relative risk of lung cancer in cigarette smokers compared with nonsmokers—the odds are pretty good that something is happening."

†Cohn cites work done by Michael Greenberg, professor of urban studies and director, Public Policy and Education, Hazardous and Toxic Substances Research Center, Rutgers University; and Peter Montague, director, Hazardous Waste Research Program, Princeton University. He also cites former *Washington Post* environment reporter, Cass Peterson.

- *Are the results specific?* Cohn writes that A causes B "is a more specific association than a sweeping statement that substance A may cause everything from hair loss to cancer to ingrown toenails."
- *Can the results be explained by confounding factors or other relationships?*
- *What is the amount of detail in describing data and possible weakness?* "There is always a lot of missing data," Cohn quotes Michael Greenberg of Rutgers University as saying. "There are always missing variables. I tend to have more belief in the individual who admits data weaknesses."

Cohn offers numerous questions for reporters to consider asking scientists. A few of them are presented here for illustrative purposes:

- What is your evidence? What do you base your conclusions on?
- Have you done a study? Has it been published or (at least) accepted by a recognized journal?
- When told about "rates" and "excess risks," ask, What are the actual figures? How many people are affected out of how large a population?
- What sort of rates would you expect normally? What are the rates elsewhere? How do you know?
- Are your assumptions based on human or animal data? How many people have you examined? What species were examined?
- Do you believe your sample—the people studied—is representative of the general population?
- How did you pick your sample—at random?
- Could the association or result have occurred just by chance? Exactly what are your figures for statistical significance? Have you worked with a biostatistician?
- What is really known and what is still unknown? What is the degree of uncertainty? Are you missing any data you would like to have had?
- What evidence might have led you to a different conclusion?
- Are you concluding that there is a cause-and-effect relationship? Or only a possibly suspicious association? Or a mere statistical association?

- Have the results been reviewed by outside scientists? Do most people in your field agree that this relationship is right for this agent?
- What is the highest safe level we can tolerate? Is the only safe level zero? Might we be exposed to multiple risks or cumulative effects? Are there individual sensitivities?
- What is the relative importance of this risk compared with others that we face in daily life?

"What we need to tell people, basically, are the answers to these questions," Cohn writes:

- Is it a risk?
- If so, how great or small?
- Under what circumstances?
- How certain is this?
- What are the alternatives?

In addressing these questions, Cohn suggests that reporters "include the uncertainties." He says uncertainties "virtually always exist in any analysis or solution. If all the studies are weak, say so. If no one knows, say so."

Reporters should also

> report probabilities ... rather than just that mainstay of jazzy leads, the worst case. This is also called the 'as many as' lead ([for] example: 'As many as a jillion could be killed'). This is not to say that worst cases should not be included—or sometimes be the lead of the story—if there is a good enough reason, not just a grab for a headline.

Cohn advocates that health and environmental reporters also "put numbers on risks" when possible and that they "compare risks when appropriate." He encourages reporters to address "scientific and technological fact."

In the end, he quotes Cornell University Professor Dorothy Nelkin, author of *Selling Science,* as saying, "The most serious problem" in reporting on risk is reporters' reluctance to challenge their news sources and "those who use the authority of science to shape the public view." Nelkin advised reporters, maintain "the spirit of independent, critical inquiry that has guided good investigation in other areas."

Chapter 10

Using the RMP's Offsite Consequence Analysis to Identify Community Hazards

The types of chemicals, their locations, and their quantities are available publicly through several EPCRA reportings. The RMP also provides this information and goes a step beyond by assessing the potential danger these chemicals pose to the community. Reporters will be most interested in the hazard assessment information provided in RMPs, including the worst-case and alternative release scenarios contained in the OCAs. These projections identify the populations in danger if a release occurs.

The OCA is an estimate of the potential harm to people and the environment beyond the facility's boarders of a chemical's release. It provides the four essential elements needed to understand the hazard:

- What hazardous substance(s) could be released?
- How much of the substance(s) could be released?
- How large is the hazard zone that could be created by the release?
- How many people could be injured?

Worst-case release scenarios will often tend to be the most sensational part of an RMP—but remember that they describe unlikely, catastrophic events (figure 9). The alternative release scenarios provide more realistic predictions of events, which, while still serious, are typically smaller in scale. The RMP also identifies other risk factor information, such as the 5-year accident history, accident prevention activities, and emergency response plans.

While the OCAs provide valuable information, this information may be difficult to access, particularly detailed information. (See Chapter 12 for tips on accessing the OCA information.)

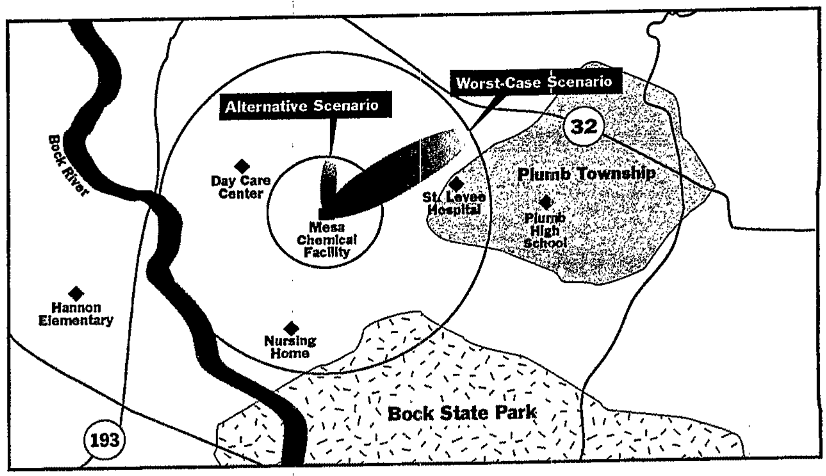


Figure 9: This map shows a worst-case scenario and a more likely alternative scenario for a typical facility. The differences between the size of the hazard zone in a worst-case and an alternative scenario can be based on a number of factors including the facility's emergency response capability, accident history, or design improvements.

Predicting the Extent of Harm from Chemical Incidents

For the purposes of the RMP OCA, EPA established specific endpoints (table 2) for toxic and for flammable and explosive chemicals covered by the RMP Rule. Although workplace exposures to many chemicals have been well studied, relatively little information is available about community exposure to these chemicals. Therefore, toxic endpoints used by the RMP Rule are often based on conclusions drawn from workplace data. More than the workforce in a facility, the general population consists of individuals who may be more sensitive and less able to protect themselves—the very young, the very old, and the infirm.

Toxic endpoints used by the RMP Rule are typically more conservative and are believed by the EPA to represent better science. Many emergency response planners will be faced with the challenge of adjusting community response plans to account for differences between RMP endpoints and previously used level of concern values. (See "Dr. ALOHA: Choosing a Level of Concern," at http://www.crossroads.nsc.org for a discussion of approaches for selecting a level of concern).

The EPA used four different sources of information about responses to chemical exposures when it selected toxic endpoints

Table 2: Four Methods of Predicting Responses to Chemical Exposure

Source	Agency/ Organization	Exposure Period	Population Protected	Goal
IDHL	NIOSH	30 minutes	Healthy, adult workers	Escape exposure without respirator
$^1/_{10}$ IDLH	EPA	30 minutes	General population	Allow the public to escape a hazardous area
ERPG-2	AIHA	60 minutes	General population	Prevent effects that could impair the ability to take protective action
TLVs	ACGIH	8 hours	Most workers	Work consistently with no harmful effects

specified by the RMP Rule: IDLH, One-tenth IDLH ($^1/_{10}$ IDLH), ERPG, and threshold limit values (TLVs).

IDLH values represent the most commonly used source of toxic endpoints. IDLHs were originally developed by the National Institute for Occupational Safety and Health (NIOSH) to guide employee respirator selection. Airborne concentrations above IDLH values are believed to pose a threat to healthy adult workers who are exposed for more than 30 minutes. Longer exposures are likely to cause immediate or delayed permanent, adverse health effects or to prevent escape from the hazardous environment.

$^1/_{10}$ IDLH measure reduces the acceptable exposure level by a factor of 10 and helps to compensate for exposures longer than 30 minutes. It also compensates for potentially higher sensitivities that can be expected within the general population. Local emergency planners frequently use this exposure value to analyze community hazard analyses.

ERPGs were developed by the American Industrial Hygiene Association (AIHA). They provide three tiers that predict the range of effects from a 1-hour exposure. The RMP Rule uses the second-tier values, ERPG-2, as endpoints for nearly 30 toxic chemicals. These values represent the maximum airborne concentration that nearly all individuals could be exposed to for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair an individual's ability to take protective action. The ERPG values do not account for individual differences in sensitivities.

TLVs are used as the endpoints for two chemicals regulated under the RMP Rule. TLVs were established by the American Conference of Governmental Industrial Hygienists (AGCIH). These occupational exposure limits represent concentrations that workers may be exposed to repeatedly for an 8-hour shift and 40-hour week without suffering adverse health effects.

Predicting Harm from Flammable Chemicals

The RMP Rule specifies that three endpoints may be considered when analyzing release scenarios for the 63 flammable chemicals regulated by the RMP Rule:

- A 1 pound per square inch (psi) increase in air pressure resulting from a vapor cloud explosion: Exposure to a 1 psi shock wave will not cause direct injury; it can break windows and cause other property damage that could result in injuries. Some people within an area exposed to a 1 psi overpressure may be hurt. Because glass shards and other shrapnel from an explosion may travel a distance greater than the 1 psi shock wave, it is possible for injuries to result beyond the distance to a 1 psi endpoint.
- Radiant heat of 5 kilowatts/meter^2 (kw/m^2) for 40 seconds resulting from a fireball or pool fire: Human skin exposure to radiant heat of this intensity for more than 40 seconds causes second degree burns or blisters, at a minimum.
- A chemical's lower flammability limit (LFL): The LFL represents the minimum percentage of flammable chemical in the air that must be present for ignition to occur. When a gas or vapor is diluted to a concentration below its LFL endpoint, it can no longer create a fire hazard.

Predicting the Potential Hazard Zone—the Distance to Endpoint

Once the endpoint is determined, the potential offsite hazard zone of an accidental chemical release—the distance to endpoint—can be predicted by air dispersion models. The models integrate information about chemical properties and release conditions and forecast the area that may become hazardous under certain conditions. Although the flow of some dense gases and vapors will be guided by terrain features, wind direction will generally control movement, creating hazards downwind from the point of release. Since it is not possible to reliably predict when accidents will occur or what the wind direction will be when they do occur, released gases and vapors may travel in any direction. Therefore, the total area that may be affected by a release is

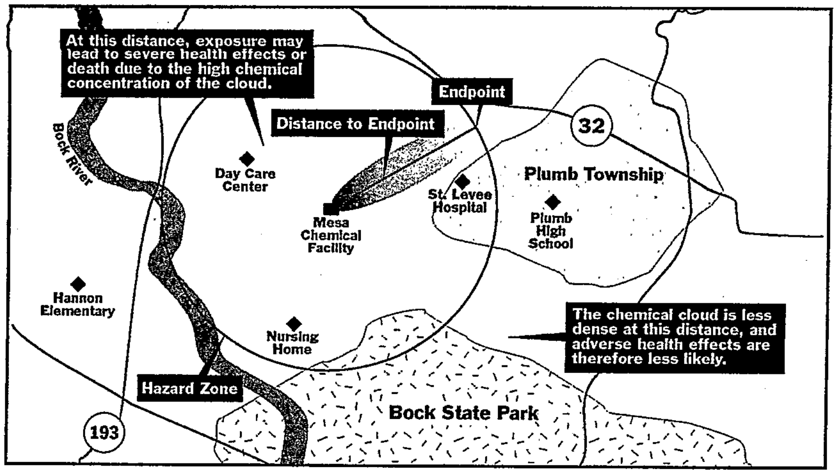


Figure 10: This is a typical map found in an RMP, showing hazardous areas, vulnerable populations, and sensitive environments. This map shows the endpoint, the distance to endpoint, and the hazard zone for one possible scenario. The hazard zone is a circle because wind variability could cause the toxic cloud or fire effects to go in a number of directions.

represented by a circle with its center at the point of release. The radius of the circle represents the distance to endpoint (figure 10).

Using EPA's chemical-specific endpoints, facilities can choose from several different methods of calculating the distance to endpoint. They can use the methodology outlined in the RMP guidance or a commercial air dispersion model as long as the model is (1) publicly available, (2) accounts for the required modeling conditions, and (3) recognized by industry as acceptable. An air dispersion model may be more accurate than EPA's methodology for predicting the mixing of pollutants in air and the distance to endpoint.

The results of any method should be viewed cautiously, because few of the fundamental algorithms used by models can be verified in actual field tests. Models are designed to simulate reality—a very complicated set of variables and interrelations that is difficult to understand and replicate. Differences in the methods used to combine the effects of each variable can result in hazard distances that vary widely. Predicted hazard distances often lie within a band of uncertainty.

Some OCAs will predict a very large distance to endpoint. However, estimating distances beyond 6 miles tends to be particularly uncertain because of local variations in meteorological conditions and topography. For example, atmospheric turbulence is a major factor in determining how quickly a toxic cloud will mix with

A Word of Caution on Using Worst-Case Scenarios

Characterizing danger using only worst-case scenarios can be misleading and unnecessarily alarming. Worst-case scenarios estimate the maximum possible area that might be affected by an accidental release. They help ensure that potential hazards to public health are not overlooked. They are not intended to represent a "public danger zone." Nor do worst-case scenarios reflect whether processes are safe. Both safe and unsafe processes using the same chemicals at the same quantity will have similar worst-case scenario outcomes.

The objectives of the worst-case scenario are (1) to create awareness about potential hazards at the facility and in the community and (2) to motivate a reduction of these hazards. Tim Gablehouse of the Jefferson County, Colorado, LEPC stressed that worst-case scenarios should not be the focus of public discussion. Instead, they should lead to an emphasis on emergency response, risk communication, and prevention efforts. The purpose of the RMP is not to generate unnecessary fear but to educate the public about hazard reduction and emergency response.

the surrounding air and become diluted. And how quickly a cloud will be diluted to below the endpoint value will affect the distance it travels. It is dangerous to assume that atmospheric turbulence and wind speed and direction will remain constant from the point where a pollutant is being released (Evans 1998).

Understanding the Worst-Case Scenario

All RMPs are required to contain an OCA for a worst-case release scenario for each regulated process. RMP worst-case scenarios must assume there is a rapid, ground-level release of the greatest possible amount of a chemical from a single vessel or pipe. Passive mitigation devices, such as dikes and containment walls around the process, may be assumed to capture or control the release if they would be likely to survive the incident.

However, active mitigation devices that require human, mechanical, or other energy to manage releases must be assumed to fail in the worst-case scenario. In addition, weather conditions must be assumed to be very mild, producing minimal mixing of the toxic gas or vapor cloud. These conditions produce a large, stable cloud with a persistent, high chemical concentration—the most severe type of hazard. EPA states that the maximum hazard zone for worst-case scenarios may be

Table 3: Worst-Case and Alternative Release Scenario Parameters

Factor	Worst-Case Release Scenario	Alternative Release Scenario
Event selection	Produces greatest distance to an offsite endpoint	More likely than worst-case scenario based on the 5-year accident history or failures identified in analysis of process hazards
Mitigation	Can consider the effect of passive systems that survive the event	Can consider the effect of passive and active systems that survive the event
Toxic endpoint	From Appendix A of RMP Rule	From Appendix A of RMP Rule
Flammable endpoint	Explosion of vapor cloud with 10% of available energy released (if endpoint is based on TNT-equivalent method)	Explosion or fire
Properties	Account for gas density	Account for gas density
Wind speed/ atmospheric stability class	3.4 miles per hour and F class stability, unless higher wind or less stable atmosphere can be shown at all times in last 3 years	6.7 miles per hour and D class stability or typical conditions for the site
Outdoor temperature and humidity	Highest daily maximum temperature in the prior 3 years and average humidity	Typical conditions for the site
Temperature of released substance	Liquids, other than gases liquefied by refrigeration, are released at highest outdoor temperature during the prior 3 years or the process temperature, whichever is higher	The appropriate process or outdoor temperature
Surface roughness and nearby obstacles	Urban or rural, as appropriate	Urban or rural, as appropriate
Dense or neutrally buoyant gases	Model accounts for gas density	Model accounts for gas density
Height of release	Ground level	Determined by scenario
Amount released	Greatest possible amount from a single vessel or pipe	Determined by scenario
Toxic gas release rate	All in 10 minutes	Determined by scenario
Toxic liquid releases	◆ Instantaneous release ◆ Pool area is 1 centimeter deep or size of passive mitigation area ◆ Rate at which it evaporates must be calculated	Determined by scenario
Distance to endpoint	Greatest offsite distance, up to 25 miles	Offsite, if appropriate

quantified for distances up to 25 miles. (Note: Some scenarios may extend farther than 25 miles, but will not be quantified beyond that point.)

Understanding How Alternative Release Scenarios Differ from Worst-Case Scenarios

Alternative release scenarios are based on more likely conditions and offer more realistic, useful emergency planning information for the facility and the public (table 3). Facilities are given latitude in selecting credible release conditions for these scenarios and can use accident history information or other knowledge of the process for selecting the hypothetical incident.

Unlike worst-case scenarios, the weather conditions are assumed to be typical for the area. In addition, these more likely scenarios assume that both active and passive mitigation systems operate as intended.

Chapter 11

TRI and RMP: What They Can't Tell You

In a perfect world, all the chemical hazard information now available under EPCRA and the RMP Rule would be accurate and understandable. Potential health effects would be readily discernible. Quantities, concentrations, and timing and duration of emissions would be reported with precision. How chemicals interact with each other in the environment would be understood. Humans would be foolproof in entering that information into readily accessible and digestible formats. But the real world of chemicals in the community is far from perfect.

Although EPCRA and the RMP program are powerful tools, they can't provide all the information a community needs to know about chemical hazards. Rather, think of EPCRA and RMP as a starting point.

TRI Data Limitations

EPA has been candid in acknowledging the limits of TRI data. Even assuming that the TRI data submitted by industry is outstanding in overall quality, reporters need to appreciate other caveats if they are to take advantage of the full potential of EPCRA for improving public understanding of chemicals in the community. Here are a few issues to keep in mind when reporting on chemicals in the community.

The Data Are Estimates, Not Monitored Releases

Remember that annual release data submitted to state commissions and EPA in the TRI Form R reports represent company estimates of the releases, not measured quantities.

The Timing of Releases Need Not Be Reported

Companies reporting their emissions need not indicate the timing of those emissions data over the course of the year. If all of a particular facility's air emissions occurred during a 6-hour period during the peak of an atmospheric inversion (an unlikely event), you'd never know it just by reviewing the Form Rs. "There is a considerable difference, from a public health standpoint, if the emissions were in several major bursts or a slow but steady stream," *Washington Post* health writer Cristine Russell wrote. But there's no requirement that industries provide a seasonal, monthly, or weekly breakdown of how their emissions occurred, just the total over the calendar year.

Data on Human Exposure Is a Major Gap

One of the most critical elements missing from the TRI is information on human exposure to the chemicals released. Release does not equal exposure. Exposure occurs only when a chemical is transported from the site of the release to population centers. Estimates of exposures can be made from estimates of releases if extensive site- and chemical-specific data are available, for example, height of an air release, wind speed and direction, distance to populations, and chemical persistence. These exposure estimates, obtained through computer models, are only as good as the data on release, meteorology, and chemical fate.

Reductions May Be "Real" or "Paper"

Reporters also need to pay attention to how the annual emission and release estimates were calculated. Calculation methods can vary from year to year and from facility to facility. Some facilities will report emission reductions not as a result of actual reductions, but rather because they used a different method of calculating emissions. Beware of this possibility. Ask about the calculation methods and how any changes in protocol may have affected results. Ask what led to any reported reductions in emissions.

The List Is a Moving Target

In making year-to-year comparisons, reporters also need to pay attention to the chemicals that are removed from or added to the reporting list. For example, calendar year 1987 reports include data on sodium sulfate releases and transfers. This chemical alone accounted for 54% of total releases and transfers for *all* TRI chemicals. Just one facility in California reported releasing 5.2 billion pounds of sodium sulfate—23% of total U.S. TRI releases and transfers.

In May 1989, EPA granted a petition to remove sodium sulfate from the list of chemicals subject to TRI reporting on the grounds that it was not of significant concern as a toxin. With sodium *sulfate included in the database,* California led the list of states emitting TRI chemicals into the environment in 1987. Without it, California dropped to ninth position. Over the years there have been many changes in the list. EPA added some 286 new chemicals in November 1994. Fortunately, EPA's annual "Public Data Release" reports have done a fairly good job of helping people compensate for such changes. EPA's reports give year-to-year comparisons for "core chemicals"—the ones that have been on the list consistently over the years, so that apples and apples can be compared.

This problem is especially worth keeping in mind when evaluating companies' claims of reducing their releases over the years. Make sure they are not claiming credit for reductions that have occurred because of delisting (or that they are not being unfairly criticized by environmentalists for increases that result from additions to the list).

The Facilities Covered Change

In May 1997, EPA added seven new industry sectors to the list of industries that must perform TRI reporting. These sectors included certain metal and coal mining facilities, electrical utilities, hazardous waste disposal facilities, chemical facilities, petroleum facilities, and solvent handling facilities. If you are making year-to-year comparisons, you will have to adjust for this change.

Chemical May Have Many Names

Chemicals can have aliases, synonyms, and multiple identifying numbers. It is a confusing world. If reporters use a popular name or a trade name, for instance, they may be missing all the other names under which a chemical is reported. Even the Chemical Abstract Service (CAS) number is not a guarantee of accuracy.

The Scope of Coverage Is Limited

Be aware that only a small fraction of all potentially toxic chemicals are covered by EPCRA reporting requirements. Moreover, these reporting requirements do not apply to all the facilities using and storing chemicals—just to those with 10 or more employees in specified standard industrial classification codes, specifically including manufacturing facilities. Only those facilities manufacturing more than 25,000 pounds or using more than 10,000 pounds annually of an affected chemical (with some exceptions) must submit Form Rs. Accordingly, the TRI database may say a lot about toxic emissions nationally, but it clearly understates the total amounts of those emissions.

RMP Data Limitations

While RMP information adds significantly to the amount and types of chemical information available, it too has limitations.

Not All Hazardous Substances Are Covered

Relying on the RMP to catalog community chemical hazards will miss some of the hazards. RMPs aren't required to be filed by a variety of facilities using hazardous chemicals such as propane, explosives, and some petroleum products. Just because a facility or process is not required to file TRI or RMP information doesn't mean your community does not have to worry about chemical dangers.

Propane, for example, is frequently involved in accidents causing casualties from fire or explosion. However, as a result of the 1999 Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act, most propane dealers are exempt from RMP requirements. If you rely only on RMP data, you might miss significant propane hazards. Almost every community has some propane facilities, and although many are small, it may be worth looking into.

Not All Scenarios Are Listed

The RMP's listing of worst-case and alternate scenarios is an important description of things that could go wrong. But it is not the only description. The worst-case scenario is the most catastrophic, but the least likely event. Only a few alternate scenarios need to be included in an RMP, but there may be many ways that safety-critical systems can fail in a complex chemical plant. Additional information maybe alluded to in the accident prevention program section of the RMP. Ask the facility for their PHA or hazard review to find out more.

Chronic Risks Are Not Addressed

The RMP is particularly aimed at identifying the hazards of sudden, catastrophic spills, releases, fires, and explosions. Communities also face potential hazards from chronic exposure to lower levels of the same chemicals. TRI quantifies the releases of many of these chemicals, but it does not estimate human exposure or health consequences. EDF's Chemical Scorecard has taken a step further in this direction by publishing some exposure estimates EPA doesn't publish.

Transportation Hazards Are Not Included

Most hazardous chemicals must be transported to or from facilities. Transportation and disposal of hazardous chemicals (which are regulated under the Hazardous Materials Transportation Act of 1975, the Hazardous Materials Transportation Uniform Safety Act of 1990, and other laws), may be a source of hazards. Transportation accidents are about as common as accidents at fixed facilities, according to the CSB. DOT and EPA databases are available that can give you some information about what is going on. Much of the transportation and disposal data are in the public record and can be found within DOT's Hazardous Material Incident Reporting System.

Not All Health Effects Are Known

Scientists don't really *know* the health effects of human exposure to many of the hazardous chemicals in industrial use today. The EDF's *Toxic Ignorance* report, published in 1997, found that health information was lacking for three-quarters of the chemicals in high-volume production use today. The "High Production Volume" initiative launched by EPA and industry in 1999 is designed to assess potential health effects, but results are years away.

Only a Summary of the RMP Must Be Submitted

While the RMP Rule requires companies to conduct numerous accident prevention response activities and to maintain a comprehensive record of its program, only a summary of this information must be submitted to EPA and disclosed to the public. For example, the law and rule require facilities to conduct a thorough PHA or review to identify all possible hazards at the plant. RMPs must include—

- The date of the most recent hazard review
- Expected completion dates for any changes resulting from it
- Major hazards identified and process controls in use
- Mitigation systems in use
- Monitoring and detection systems in use
- Changes since the last hazard review

But the summary submitted to EPA has only the *date* on which that review was conducted. That means all that reporters and the public can get from EPA electronically is the date—that is all that EPA has. The date alone is of modest help to communities in understanding the nature and magnitude of potential dangers. The PHA itself might be much more useful.

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Chapter 12

Tips on Getting Offsite Consequence Information

The Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act limits the distribution of RMP OCA data and prevents access for at least 1 year to a searchable, national, electronic database that could be posted on the Internet.

However, there are a number of possible ways to get information on facilities' potential offsite consequences. Facilities are allowed to disclose their own OCA information. Most of the facilities are required to hold a public meeting to discuss their RMP, including a summary of OCA information. Some companies have included a summary of their worst-case scenario in their RMP executive summaries. Some information may be available from state agencies, the LEPCs, or the EPA regional offices.

Getting Information from LEPCs and SERCs

For local stories, LEPCs and SERCs are usually key sources, but much depends on the capabilities of the particular agency you are dealing with. It is worth getting to know your LEPC, because it may consist of individuals, such as a local fire chief or HAZMAT responder, who can help you on all kinds of chemical release and emergency stories. LEPCs vary considerably. In some states, LEPCs scarcely exist, but parallel agencies under unique state laws take their place. In other states, a single LEPC may cover a large region or the whole state. Keep in mind that their staff resources are limited. Although SERCs and LEPCs are required by federal mandate, they typically do not receive any federal operating funds. Also be aware that some LEPC members may identify with the interests of local chemical companies. In addition, the reporting facility may actually be a municipal water or sewage plant, and a sister municipal agency on the LEPC may act protectively.

LEPCs and SERCs may have information that EPA does not. An example is the Tier II information facilities may make available under EPCRA. Once the LEPC has the information, they are required by EPCRA to make it available to the public on request.

Moreover, if the public requests Tier II information that the LEPC does not have, the law strongly encourages the LEPC to request it from the facility.

Getting Information from Facilities

The horse's mouth, when it comes to information on hazardous chemical discharges and emergencies, may be the company or facility itself. It knows more about its own operations than anyone.

During the 1990s, many facilities handling hazardous chemicals opened themselves up to public scrutiny to a degree previously unimaginable. The chemical industry as a whole also appeared to open up in important ways. In the late 1980s, just before the EPCRA requirements kicked, the Chemical Manufacturers Association established a program called Responsible Care®. It amounted to a code of conduct that stressed continuous efforts at risk reduction, proper disposal of wastes, and openness to public scrutiny.

Many plants have thrown themselves into this effort wholeheartedly. Typically, they tend to be major plants of major companies: well financed and managerially and technically competent. It is worth remembering, however, that many small companies are not involved in Responsible Care®.

Attending Public Meetings

The Chemical Safety Information, Site Security, and Fuels Regulatory Relief Act requires facilities (except those under Program 1) to hold a public meeting to summarize their RMP including OCA information. Small companies may publicly post the information rather than hold a meeting. Even before the June 1999 deadline for RMP submittals, many companies were going public with RMP information. Groups of companies in various cities put on "roll-outs" of their RMPs with press conferences and information on each company. While the companies can claim credit for initiative and openness in these events, critics in the environmental movement dismiss them as public relations exercises aimed at putting a preemptive positive spin on RMPs and limiting hostile questioning.

The key to good reporting on RMPs is getting beyond the press packets and asking probing questions. Use public data to generate questions. Ask to inspect the plant or go on an inspection tour when community and environmental groups take one. Having an outside expert with you during the tour might help. The "safety information" and "hazard review/analysis" documents generated during the PSM and RMP processes will be a gold mine of information. While companies are not legally required to disclose all of this *information, ask to see it.* A company's response to such requests may reveal a lot about their commitment to openness with the public.

Finding Other Information Sources

Local community action and environmental groups can be great sources of information on what companies are doing. They may be active in monitoring companies' actions and scrutinizing procedures and operations. Union representatives may be able to provide information related to worker safety and training. Other potential sources of information and insights may include a company's suppliers and vendors and individuals living near a facility.

Information submitted under other laws and regulations can also be useful. For example, CERCLA requires that facilities notify the NRC, EPA regional offices, the SERC, and the LEPC of chemical releases. There are federal and state plant siting and air emission requirements, and some states have additional reporting and right-to-know requirements. Determining whether all required information has been submitted to the appropriate entity, and the extent to which reported values agree, can provide an indication of the reliability of particular RMP information.

Chapter 13

Some Issues for Journalists and LEPCs

EPCRA specified that LEPCs should include representatives of the media among their membership. However, relatively few committees have managed to include reporters as members. This was not simply the result of reluctance on the part of LEPCs, nor was it the time pressures of reporters' jobs. It was partly a matter of professional ethics. The law's vision of reporters as partners in a community education enterprise conflicted with the media's vision of journalists as independent, disinterested observers. A reporter could have a hard time writing objectively about the proceedings of a committee of which he or she was a member. However, the reporter who writes about the LEPC does not need to be the same one who sits on the LEPC.

LEPCs need critics. Some are failing to plan effectively for community safety. Yet few newspapers and stations have held LEPCs to account by examining how well they are doing their job or how they might do it better.

In the years since EPCRA was passed, the so-called "civic journalism" movement picked up steam in the United States. In a nutshell, its premise was that media had a responsibility to be more actively involved, and to get the public more involved, in government policy decisions. The idea was that people needed to understand the choices that government was making and that government needed to understand what the people thought should be done. Journalists can do this job on or off an LEPC.

Reporters and Emergency Preparedness

Does the media have a responsibility to educate the public about how to protect themselves, even if there is no immediate news hook? A legitimate argument could be made that it does. In addition, discussions with LEPC members and others could result in all sorts of stories.

When hazardous chemicals are involved, an unprepared community may well be a community in danger. For example, do people know when and how to shelter in place? If evacuation is called for, will people be alerted quickly? Will they know if evacuation routes are choked with traffic? Do people know what the plant's emergency siren sounds like? Can they hear the sirens indoors? If the plant has an automatic phone-dialing system to alert neighbors, does it work? Would a new bridge or ramp speed evacuation? Do local hospitals have enough capacity and skill to handle a chemical disaster? Are their disaster plans adequate?

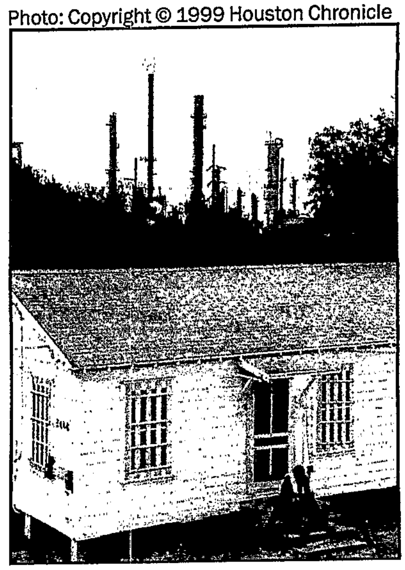
Good preparation can cost money. While LEPCs may be reticent to propose costly solutions, the news media may be better situated to ask aggressive, unsettling questions about chemical emergency preparedness and to help the public understand the risks and the options. The news media can play an important role in chemical safety—building public awareness, and promoting prevention and preparation efforts that will lead to greater public safety.

The One Important Question

In the end, there may be only one important question that your audience or community wants answered more urgently than any other does: Am I safe? Are my children and family safe? If you get lost in the details and technicalities of EPCRA and RMP data, you may easily lose sight of the question and the answers to it, in human terms.

EPA has tried to focus on this question. One way it has done this is by stressing the general duty clause of the CAA. This provision states that facilities have a general duty to operate safely, whether or not they are handling listed chemicals or are covered by the specific requirements of the RMP Rule. So if you think a facility is doing something unsafe, and it tells you everything is perfectly legal because the RMP Rule doesn't cover the facility or allows the behavior, don't necessarily believe it.

People want a yes-or-no answer to the "Am I safe" question, and the most authoritative answers tend to fall somewhere between "probably" and "probably not." Sometimes



a crusading reporter or environmental group tends to think that once they have identified a previously unknown hazard, they have discovered a "truth" that the public needs to know about. The public certainly needs to know about potential hazards. And while alarm is a great way to drive up ratings and readership, realism is just as important. The journalist's responsibility is just as much to avoid excessive alarmism as it is to avoid excessive complacency.

A Focus on Prevention

A lot can be done to make most plants that handle hazardous chemicals safer. Safety is something that can be designed into a facility or process and built from the ground up. When processes are inherently safe, human error or equipment failure is much less likely to result in a disaster. Making processes safer might require redesign or substituting less-hazardous chemicals for more-hazardous ones. It might mean maintaining smaller chemical inventories. It might mean moving at-risk populations away from plants by buying up properties within a buffer zone.

Writing a story that scares people and blames someone is easy. It is easy to write and easy for people to understand. It is much harder to write about what can be done to make a hazard safer, because it requires more detailed understanding and often complex and difficult choices. The answer to the "Am I safe?" question is ultimately written not in the present tense, but in the future tense. The answer comes not just from alarm, but from knowledge and action.

Contact: Occupational Safety and Health Administration, Department of Labor, Public Affairs Office, Room 3647, 200 Constitution Avenue, Washington, DC, 20210, (202) 693-1999.

U.S. Environmental Protection Agency, Chemical Emergency Preparedness and Prevention Office (http://www.epa.gov/ceppo)

EPA's web page for Chemical Accident Prevention and Risk Management Planning provides very useful, comprehensive information. Examples of available information include fact sheets, questions and answers, newsletters, links to non-EPA sites, section 112(r) of the Clean Air Act, the List of Regulated Substances and Thresholds for Accidental Release Prevention, the Risk Management Program Rule regulations, technical guidance documents, and many other resources. EPA will maintain an online database of all RMPs in RMP*Info. However, RMP*Info will not contain the OCA data. The site links to free RMP*Comp software that identifies the size of the geographic area that may become hazardous following an incident.

Contact: Carole Macko, Team Leader Communications, Chemical Emergency Preparedness and Prevention Office, EPA, 401 M Street, SW 5104, Washington, DC 20461, (202) 260-7938, macko.carole@epamail.epa.gov.

U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics (http://www.epa.gov/opptintr)

EPA's Office of Pollution Prevention and Toxics maintains a Web site that provides current information on the Toxics Release Inventory (http://www.epa.gov/opptintr/tri/). In addition, the Web site provides information on the Chemical Right-To-Right Initiative, High Production Volume Challenge Program, an initiative launched by EPA in 1999 to assess potential health effects of chemical exposure (http://www.epa.gov/opptintr/chemrtk/volchall.htm).

U.S. Environmental Protection Agency, Resource Conservation and Recovery Act, Underground Storage Tank, Superfund, and EPCRA Hotline (http://www.epa.gov/epaoswer/hotline)

This site provides information on how to contact the EPA-sponsored hotline that addresses the Risk Management Program Rule. Other information resources are also provided. Many related documents, including those listed on the EPA Chemical Emergency

Preparedness and Prevention site, can be ordered by calling (800) 424-9346 or (703) 412-9810 in the Washington, DC, area.

Nonfederal Organizations

Chemical Manufacturers Association (http://www.cmahq.com)

Contact: James Solyst, Team Leader, Information Management/ Right-To-Know, Chemical Manufacturers Association, 1300 Wilson Boulevard, Arlington, VA 22209, (703) 741-5233, jim_solyst@mail.cmahq.com.

CMA Responsible Care® Program (http://www.cmahq.com/cmawebsite.nsf/pages/responsiblecare)

This Chemical Manufacturers Association web page provides information about the association's Responsible Care® Program. Safety Street and other materials on the Kanawha Valley Demonstration Program may also be available by calling (703) 741-5213.

The Center for Chemical Process Safety (http://www.aiche.org/docs/ccps/index.htm)

Information on chemical process safety, engineering design, and related issues is available through the Center for Chemical Process Safety (CCPS) Web site or by phone at (212) 591-7319. CCPS is a nonprofit professional organization affiliated with the American Institute of Chemical Engineers.

The National Safety Council/Crossroads (http://www.crossroads.nsc.org)

The Environmental Health Center's Crossroads Chemical Emergency Management page is designed to expand and strengthen the network of organizations involved in emergency planning and response, chemical safety, and hazardous chemical rules and regulations. This Web page will continually evolve to feature a comprehensive risk communication repository focusing on the Risk Management Program Rule. Additional useful resources not included in this document can be found at this Web site.

Contact: Lee Feldstein, Environmental Health Center, A Division of the National Safety Council, 1025 Connecticut Avenue, NW, Suite 1200, Washington, DC 20036, (202) 293-2270, feldstein@nsc.org.

The Working Group on Community Right-to-Know (http://www.rkt.net/wcs or http://www.uspirg.org)

Contact: Paul Orum, Coordinator, Working Group on Community Right to Know, Washington, D.C. (202) 544-9586, paul_orum@yahoo.net.

Federal Data Sources

The Emergency Response Notification System (http://www.epa.gov/ERNS/)

The Emergency Response Notification System (ERNS) is a database used to store information on notifications of oil discharges and hazardous substances releases.

Envirofacts Warehouse (http://www.epa.gov/enviro)

EPA created the Envirofacts Warehouse to provide the public with direct access to the wealth of information contained in its databases. Envirofacts houses RMP and TRI data.

The Hazardous Materials Incident Reporting System (U.S. Department of Transportation)

Contact: Sadie Willoughby, Data Manager Information Systems, DHM-63, Research and Special Programs Administration, U.S. Department of Transportation, 400 7th Street, SW, Washington, DC 20590, (202) 366-4555.

The Incident Reporting Information System (IRIS) (http://www.nrc.uscg.mil/nrchp.htm)

IRIS is a database maintained by the National Response Center on all reported oil, chemical, radiological, biological, and etiological discharges into the environment anywhere in the United States and its territories.

The Integrated Management Information System

U.S. Department of Labor, Occupational Safety and Health Administration (http://www.osha.gov/oshstats/index.html).

Bureau of Labor Statistics, U.S. Department of Labor (http://stats.bls.gov:80/datahome.htm).

The National Fire Incident Reporting System (NFIRS) (http://www.usfa.fema.gov/nfdc)

This data system is maintained by the U.S. Fire Administration, Federal Emergency Management Agency. The NFIRS is the world's largest national annual database of fire incident information. State participation in NFIRS is voluntary, but 42 states and the District of Columbia report NFIRS data. Participating departments report an average of 1 million fires each year.

Nonfederal Data Sources

RTKNET (http://www.rtknet.org)

RTKNET is a nonprofit Web site that houses TRI data, RMP executive summaries, and other right-to-know databases.

Scorecard (http://www.scorecard.org)

The Environmental Defense Fund's Scorecard delivers accurate information on the toxic chemicals released by manufacturing facilities and the health risks of air pollution. It can rank and compare the pollution situation in areas across the United States. Scorecard also profiles 6,800 chemicals, making it easy to find out where they are used and how hazardous they are.

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USPIRG's report examines chemical facilities in the United States that store chemicals defined by the EPA as "extremely hazardous substances" due to their high accident hazard.

Vogt, Barbara; and Sorenson, John. 1999. *Description of Survey Data Regarding the Chemical Repackaging Plant Accident, West Helena, Arkansas*. ORNL/TM-13722. Oak Ridge, Tennessee: Oak Ridge National Laboratory. (http://Emc.ornl.gov).

Regulations/Guidance Documents

OSHA Fact Sheet (OSHA 93–45) summarizing the PSM Standard (http://www.osha-slc.gov/OshDoc/Fact_data/FSNO93-45.html)

PSM Standard (29 CFR 1910.119) (http://www.osha-slc.gov/OshStd_data/1910_0119.html)

RMP Legislation (40 CFR Part 68) and regulations (http://www.epa.gov/ceppo/pubs/potw/98part68.pdf)

RMP Regulatory Guidance and Support information (http://www.epa.gov/swercepp/acc-pre.html)

Journalism

The Augusta Chronicle
http://www.augustachronicle.com/
Meghan Gourley and others at the *Augusta Chronicle* wrote about the two releases of toxic chemicals from one chemical plant that affected the surrounding community on November 18 and 21, 1998. These stories illustrate community concern over local hazards, and factors that impact risk. Reporters at the *Chronicle* can be reached at (800) 622-6358, Meghan Gourley at extension 3227 and Robert Pavey at extension 119. E-mails for these reporters are Meggit@hotmail.com and Rpavey@augustachronicle.com.

Fehr, Stephen C. 1999. With Toxic Risk, Plans Vary, Some Localities Are More Ready than Others to Deal with Major Hazard, *Washington Post* (October 10, 1999). This article provides a comprehensive review of chemical hazards in the Washington, DC, metropolitan area and a discussion of emergency planning.

Tedeschi, Bruno. 2000. The Dangers Next Door, Bergen (NJ) *Record* (January 9, 2000). The author uses RMP filings to review chemicals hazards and risks in Bergen and Passaic counties, New Jersey.

Glossary

Active mitigation: Equipment, devices, or technologies that need human, mechanical, or other energy input to capture or control released substances (e.g., interlocks, shutdown systems, pressure relieving devices, flares, emergency isolation systems).

Acute toxicity: The ability of a toxic substance to cause serious adverse health effects shortly after exposure.

ANSI: The American National Studies Institute, which is the organization that coordinates development of national, voluntary standards for a wide variety of devices and procedures.

ASTM: The American Society for Testing and Materials, which is a developer and provider of voluntary standards.

CAA: The Clean Air Act. Section 112(r) of the Clean Air Act includes requirements for establishing the RMP Rule and other related activities.

CAS Registry Number: A unique identification number assigned to a chemical by the Chemical Abstracts Service, a division of the American Chemical Society.

CERCLA: The Comprehensive Environmental Response, Compensation, and Liability Act of 1980, also known as Superfund, which established requirements for closed and abandoned hazardous waste sites and for liability for releases of hazardous waste sites. CERCLA authorizes EPA to respond to releases of hazardous substances that may endanger human health or the environment.

CHEMTREC: The Chemical Transportation Emergency Center is a hotline operated by the Chemical Manufacturers Association. It provides advice on responding to chemical transportation emergencies.

CSB: The Chemical Safety and Hazard Investigation Board, commonly referred to as the Chemical Safety Board or CSB, is an independent, federal agency whose chief mission is to improve chemical safety by protecting workers, the public, and the environment from the dangers of chemical related accidents. It was established under section 112(r)(6) of the Clean Air Act.

Chronic toxicity: The ability of a toxic substance to cause adverse health effects from repeated exposure over a relatively prolonged period of time.

Distance to endpoint: The estimated distance from a point of toxic release to the point where it is no longer considered hazardous to people.

Dose: The quantity of a chemical to which an individual is exposed over a given period.

Environmental receptors: As used in the CAA, a natural area that could be exposed to a chemical hazard as a result of an accidental release (e.g., national or state parks, forests, or monuments; wildlife sanctuaries and preserves; wildlife refuges; and federal wilderness areas).

Extremely hazardous substance: A substance identified under EPCRA whose release may be of immediate concern to the community because of its irreversible health effects.

EPCRA: The Emergency Planning and Community Right-to-Know Act of 1986 (Title III of the Superfund and Reauthorization Act of 1986 or SARA Title III) established chemical emergency planning and community right-to-know requirements for federal, state, and local governments and industry.

ERPG: Emergency Response Planning Guidelines, which were developed by the American Industrial Hygiene Association. ERPG values provide estimates of maximum airborne concentrations of toxic chemicals that most people could be exposed for up to 1 hour without developing certain health effects.

Exposure: Whether and how a human or other organism comes into contact with a chemical—usually by eating or drinking it, inhaling it, or touching it and having it penetrate the skin.

General Duty Clause: The section of the CAA that directs owners and operators of facilities producing, using, handling, or storing hazardous substances (whether or not they are regulated under the RMP Rule) to design and maintain a safe facility, to prevent accidental releases, and to minimize the consequences of any that occur.

Hazard: Something that is capable of causing harm. For chemicals, the inherent properties that represent the potential for personal injury or environmental damage that can result from exposure. The severity of the hazard often depends on its concentration and exposure.

IDLH: Immediately dangerous to life or health values are the maximum airborne concentrations of chemicals to which healthy adult workers can be exposed for 30 minutes and escape without suffering irreversible health effects or symptoms that impair escape. IDLH values are set by NIOSH.

LEPC: Local emergency planning committees are groups established by EPCRA to coordinate the development of community chemical emergency plans and coordinate to communicate the plans to local stakeholders.

List Rule: The List of Regulated Substances and Thresholds for Accidental Release Prevention (40 CFR 68.130) identifies acutely toxic substances and highly volatile, flammable substances that are regulated under the RMP Rule.

LFL: The lower flammability limit is the lowest concentration in the air at which a substance will ignite.

MSDS: A Material Safety Data Sheet contains information related to the particular hazards of a chemical and protective measures.

NAICS Code: The North American Industry Classification System is the new standard coding system to categorize businesses and industries. It replaces the Standard Industrial Classification (SIC) code system.

OCA: The offsite consequence analysis is a determination of the potential effects of a chemical accident in the area surrounding the facility property.

OSHA: The Occupational Safety and Health Administration establishes standards to protect employees from workplace injuries and illnesses.

Passive mitigation devices: Equipment, devices, or technologies that function without human, mechanical, or other energy input to capture or control released substances (e.g., building enclosure, dikes, and containment walls).

Potency: The toxicity of a chemical, that is the ability of a chemical to do systematic damage to an organism.

ppm: Parts per million is a unit used to express the concentration of a substance in air, water, or land. It is commonly used in establishing maximum permissible amounts of contaminants.

Process: Under the PSM Standard and the RMP Rule, any industrial activity involving a regulated substance, including any use, storage, manufacturing, handling, or onsite movement. Includes any group of vessels that are connected and separate vessels located where they could also become involved in a release.

Public receptor: Offsite residences; institutions (e.g., schools, hospitals); industrial, commercial, and office buildings; parks; or recreational areas inhabited or occupied by the public.

PSM Standard: OSHA's 1992 Process Safety Management of Highly Hazardous Chemicals Standard (29 CFR 1910.119) is intended to prevent or minimize the employee consequences of a catastrophic release of toxic, reactive, flammable, or highly explosive chemicals from a process. It served as a model for the RMP Rule prevention program requirements.

Retail facility: A facility at which more than one-half of the income is obtained from direct sales to end users or at which more than one-half of the fuel sold, by volume, is sold through a cylinder exchange program.

RMP: The risk management plan is a summary of a facility's risk management program, as required under the RMP Rule.

RMP Rule: The Risk Management Program Rule is a set of regulations established under Section 112(r) of the Clean Air Act that provide guidance for the prevention and detection of accidental releases of regulated hazardous substances and preparation of RMPs.

RMP*Submit™: Software, available free from EPA, that facilities can use to submit RMPs.

SARA Title III: See EPCRA

SERC: The State Emergency Response Commission, which under EPCRA, each governor must appoint. The SERCs are responsible for appointing LEPCs, reviewing local emergency plans, and receiving chemical release notifications.

Shelter-in-Place: The practice of staying inside homes or other building to provide temporary protection from chemical releases rather than evacuating the area. It may include closing and sealing doors and windows and turning off heating and air conditioning.

SIC: Standard Industrial Classification codes were assigned to categories of U.S. industries and are referenced in the RMP Rule. They have been replaced by NAICS codes.

Stationary source: Any buildings, structures, equipment, installations, or related stationary activities that produce pollution; often facilities using industrial combustion processes. A fixed-site facility.

Threshold limit value: A workplace exposure standard—the concentration of an airborne substance that a healthy person can be exposed to for a 40-hour workweek without adverse effect. The American Conference of Government Industrial Hygienists recommends occupational exposure guidelines.

Threshold quantity: The quantity of regulated chemicals, in pounds, specified in EPA's List Rule. Any facility that has more than the threshold quantity amount of a listed substance for use in a single process must file a RMP.

TRI: The Toxic Release Inventory is an EPA database of information about toxic chemicals used, manufactured, treated, transported, or released into the environment, based on reports submitted to EPA under EPCRA

Acronym List

$^{1}/_{10}$ IDLH	One-tenth IDLH
ACGIH	the American Conference of Governmental Industrial Hygienists
AIHA	the American Industrial Hygiene Association
BLEVE	boiling liquid, expanding vapor explosion
CAA	Clean Air Act
CERCLA	The Comprehensive Environmental Response, Compensation, and Liability Act
CSB	Chemical Safety and Hazard Investigation Board
DOT	The Department of Transportation
EDF	The Environmental Defense Fund
EPA	The Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
ERPG	emergency response planning guidelines
FEMA	the Federal Emergency Management Agency
GIS	geographic information system
IDLH	immediately dangerous to life and health
IRE	Investigative Reporters and Editors
kw/m^2	$kilowatts/meter^2$
LD_{50}	a dose that is lethal to 50% of the animals tested
LEPC	local emergency planning committee
LFL	lower flammability limit
mmHg	millimeters of mercury
MSDS	material safety data sheets
NICAR	the National Institute of Computer Assisted Reporting
NIOSH	the National Institute for Occupational Safety and Health
NTSB	the National Transportation Safety Board

NRC	National Response Center
OCA	offsite consequences analysis
OSHA	the Occupational Safety and Health Administration
PHA	process hazard analysis
ppm	parts per million
psi	pound per square inch
PSM	Process Safety Management
RMP	risk management plan
SEER	National Cancer Institute's Surveillance, Epidemiology, and End Results
SERC	state emergency response commission
TLVs	threshold limit values
TRI	the Toxic Release Inventory
USPIRG	U.S. Public Interest Research Group

EPA 550-B-00-003
March 2000

The Environmental Health Center (EHC) is a division of the National Safety Council, a nonprofit, nongovernmental organization. The National Safety Council, founded in 1913, is a national leader on accident prevention and home, workplace, auto, and highway safety issues.

The National Safety Council established EHC in 1988 to undertake environmental communications activities aimed at helping society and citizens better understand and act knowledgeably and responsibly in the face of potential environmental health risks. Since that start, EHC has built a strong record of effective, nonpartisan communication on environmental health risks and challenges.

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