

Experience With US National Programs for Hazardous Chemical Management and Voluntary Industry Reductions

June C. Bolstridge
President, GAIA Corporation

In the aftermath of chemical disasters such as the tragedy in Bhopal, India, the United States has implemented various national programs for the tracking and management of hazardous and toxic chemicals. Many significant lessons have been learned through the regulatory mandates of the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, the guidelines established by the Pollution Prevention Act (PPA) of 1990, and the voluntary chemical release reduction effort known as the “33/50” program. While none of these efforts offers a blueprint for the implementation of SAICM in developing countries, significant effort may be saved by building upon both the accomplishments and the failures of these chemical management programs.

Regulating Chemical Management Through Public Reporting

EPCRA is a US Federal statute, which mandates that industrial facilities determine the amounts of specific chemicals stored and used at their facilities, and then report those chemicals to either local or national authorities. While the law does not require changes in the amounts of chemicals present onsite or released to the environment, it has resulted in significant improvements in US industry’s use of toxic and hazardous chemicals, and only limited improvements in governmental and non-governmental organizations’ understanding of chemical data.

Examples of improvements in chemical management have resulted from public reporting:

- Knowledge of the largest quantities of toxic and hazardous materials present in a local community allows organizations to share resources for emergency response.
- Merely totaling the losses represented by chemical releases will change industrial practices, since waste represents economic losses in raw materials and products.
- Local public concern over chemical quantities can drive major industrial changes, when the industries function as part of the community.

[Case Study: Kodak Corporation, in Rochester, New York, USA substantially reduced its solvent usage in making photographic film when community concerns were raised, despite being in compliance with national and state regulations and permit limits.]

Examples of failures in chemical management that have also resulted from reporting:

- Complexities in the reporting requirements and formats have required massive guidance documents and lengthy training courses to be developed, including for specific industries, chemicals, and types of releases.
- Quantities of chemicals reported are just numbers that cannot be interpreted or understood unless some context is provided for the relative importance or risk involved.

[Case Study: Metal mining industries spent extensive effort and legal action to clarify reporting on “waste rock,” which is unprocessed overburden that must be moved from one location to another in the process of reaching the ore beneath.]

Directing Chemical Management With Goal-Oriented Programs

The U.S. Pollution Prevention Act (PPA) of 1990 established a hierarchy for eliminating wastes, recycling what could not be avoided, treating what remained, and applying disposal only as a last resort. Without mandating specific operational changes, the PPA defined a new set of goals for sustainable chemical management that echoed the benefits of waste reductions already identified through regulatory programs. The Act also re-focused industry on the idea that recycling was no longer good enough.

Examples of improvements in chemical management resulting from goal-oriented programs:

- Industries found new uses or markets for spent materials that had been expensive to dispose of as wastes.
- Companies have identified substitute materials that eliminate hazardous waste streams.
- Segmenting process streams resulted in materials that could be returned to the process, thus eliminating waste and reducing material costs.

[Case Study: Spent sandblasting materials that had been sent to a hazardous waste landfill are now being directly used as raw materials in the fabrication of utility sinks, and incorporate the waste paint chips as a source of color.]

Examples of failures in chemical management that have also resulted from goal-oriented programs:

- Substitute materials were sometimes implemented without consideration of the effects on the treatability of the remaining waste.
- Some companies eliminated their previous focus on recycling of wastes, since reporting was required for amounts of chemicals recycled as well as disposed.

[Case Study: A less toxic cleaner caused extreme foaming problems in the industry's wastewater due to the surfactants that it contained.]

Achieving Chemical Reductions Through Voluntary Industry Programs

Several voluntary programs have invited industrial facilities to identify their own means to achieve certain reductions in the quantities of hazardous materials. The U.S. EPA's 33/50 Program invited industrial facilities to voluntarily commit to reducing their wastes of toxic chemicals reported under EPCRA by 33 percent within four years, and by 50 percent within seven years.

Examples of improvements in chemical management resulting from voluntary industry programs:

- Many companies found it extremely easy to achieve major reductions in toxic and hazardous chemicals once they accepted the reduction goals as a challenge, and invited worker suggestions for meeting them.
- Companies in the 33/50 program reduced waste generation at a rate that was three times greater than non-participating companies during the first two years of the program.

- Vendors and suppliers willingly revised their products in ways that would reduce the amounts and hazards of the wastes generated by their largest customers, when such changes assured a larger market share.

[Case Study: A service providing metal parts washers to machine shops changed to a water-based cleaner to replace all of its flammable and toxic solvents after complaints from their clients about organic vapor emissions in the workplace.]

Examples of failures in chemical management that have also resulted from voluntary industry programs:

- Industries took credit for closing unprofitable facilities or product lines that were already scheduled for elimination.
- Companies delayed implementing reduction programs until the end of the base year that was to be used for comparison with future reductions.

[Case Study: Studies have found that companies participating in the 33/50 program were inspected by regulatory agencies less often, so some companies' decisions to join the voluntary program may have been driven by the regulatory programs already in place.]

Recommendations Based On the Lessons Learned

Implementation of national programs for chemical management can result in substantial improvements in the efficiencies of chemical handling, as well as in the level of knowledge that local response organizations have about the hazards of chemicals in their community.

Specific lessons learned through the implementation of US chemical management programs:

- Industrial chemical management can achieve improved efficiencies in material usage by making managers aware of the total material losses, as well as through setting challenging goals to be achieved.
- Beneficial public and governmental use of data on chemicals management absolutely require a context within which the information can be compared, applied, and understood.
- Development of industry-specific information can create a sense of competition that promotes improvements as well as the opportunity for the sharing of best practices that are effective and applicable.
- Numeric goals for reducing chemicals in waste will invite some industrial facilities to manipulate their programs, but the overall effect of focusing attention on reductions will substantially outweigh any mismanagement of the data.

SAICM has the clear potential to drive more efficient and less dangerous chemical management practices throughout the world. However, a major part of SAICM's opportunity will be lost unless adequate emphasis is placed on good data management, which is essential to turn the data into information that can be understood and applied by industry, communities, governmental, and non-governmental organizations.