

Guest Editorial

SARA Title III—A new era of corporate responsibility and accountability

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Abstract

Title III of the Superfund Amendments and Reauthorization Act (SARA), also known as the Emergency Planning and Community Right-to-Know Act of 1986, requires significant accountability of industry for the use and release of toxic and hazardous chemicals. This act requires emergency planning for hazardous material emergencies at state and community levels, emergency notification for releases of hazardous chemicals, and the reporting to local communities and state and federal agencies of inventories and releases of toxic chemicals. Failure to comply with the requirements of the Act could result in the imposition of civil and criminal penalties. In addition, compliance with the reporting requirements has resulted in the dissemination of reported information into the public domain. The availability of this information and its subsequent use by the U.S. Environmental Protection Agency and the public has made industry strictly accountable for its use and release of toxic and hazardous chemicals. This special issue focuses on two separate but related aspects of SARA Title III: emergency planning and notification, and annual toxic chemical release reporting.

Introduction

Title III imposes significant reporting and notification requirements on a wide spectrum of facilities in both the manufacturing and non-manufacturing sectors of industry. Initial notification under SARA Title III was originally required in 1987. Community right-to-know reporting was subsequently required on an annual basis, with reporting requirements gradually becoming more onerous. Although these requirements were initially focused on the manufacturing sector of industry, some of them were extended to the non-manufacturing sectors of the industry when OSHA expanded the scope of the Hazard Communication Standard (HCS). The legislation provided for successive

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reductions in the thresholds above which chemical-specific reporting was required for the Toxic Release Inventory (TRI). In addition, many states have exercised their prerogative to require more detailed reporting than that required by the Act. Now that we are entering the fifth year of reporting, the Environmental Protection Agency (EPA) has proposed requirements for reporting of waste recycling, treatment, and minimization information, which are in response to the requirements of the Pollution Prevention Act of 1990.

The *Journal of Hazardous Materials* has devoted a special issue to SARA Title III. Because of the breadth of this multi-faceted statute and the historical and current implications of the reporting requirements to industry, this issue focuses on emergency planning and notification, and the annual reporting of toxic chemical releases. The remainder of this article provides a brief summary of SARA Title III, an overview of the issues and articles contained in this special issue, and an outlook on the future of the requirements and implications of SARA Title III reporting. A glossary of terms and acronyms used throughout this special issue is provided at the end of this introductory article.

SARA Title III requirements

The major statutory provisions under SARA Title III, as they relate to facility compliance requirements, are primarily codified in a series of regulations [1-4]. The first set of provisions relate to emergency planning and emergency release notification.

Section 301 — Provides for the appointment of state emergency response commissions (SERC) and the designation of emergency planning districts and local emergency planning committees (LEPC) by the SERC.

Section 302 — Requires notification if any of over 360 extremely hazardous substances (EHS) are present in excess of threshold planning quantities (TPQ). Notification is required by facility owners and operators to the SERCs.

Section 303 — Directs local communities to prepare emergency response plans and requires facilities that submitted a notification under Section 302 to designate an emergency coordinator.

Section 304 — Requires immediate notification of off-site releases exceeding reportable quantities (RQ) for EHSs under Section 302 (and hazardous substances under CERCLA Section 103 (a)) to the community emergency coordinator.

The requirements for community right-to-know reporting are addressed in the following specific sections of the legislation.

Section 311 — Facilities required to have Material Safety Data Sheets (MSDS) available for chemicals under the OSHA HCS (29 CFR 1910.1200) must submit MSDSs, or a list of chemicals, to the SERC, LEPC, and local fire department.

Section 312 — Facilities subject to Section 311 reporting must provide a “Tier I” emergency and hazardous chemical inventory form annually by March 1 for the previous calendar year, to the same entities as in Section 311. “Tier II” information on individual chemicals must be provided if specifically requested. The threshold for reporting EHSs is 500 pounds or the TPQ, whichever is lower, and the threshold for CERCLA hazardous substances is 10,000 pounds. Many states require filing of Tier II forms (e.g., California, Louisiana, Massachusetts, North Dakota, Ohio, Pennsylvania, Texas, Washington) and certain states have lower thresholds for reporting (e.g., New Jersey).

Section 313 — Owners or operators of facilities satisfying specific criteria must submit toxic chemical release inventory “Form Rs” annually by July 1 for the previous calendar year for each reportable chemical to U.S. EPA and the SERC.

SARA Title III contains additional provisions regarding withholding of trade secret information, civil penalties for noncompliance, citizen’s suits, and others.

Probably the most difficult and time-consuming requirement under SARA Title III is development of the multimedia release inventory for completion of the Form R. Facilities that satisfy the following criteria must comply with these requirements:

- Standard Industrial Classification (SIC) Codes 20 to 39;
- employ 10 or more persons full time;
- manufacture or process 25,000 pounds or more of any of over 300 toxic chemicals or 20 chemical categories; and
- otherwise use 10,000 pounds or more of any listed toxic chemicals/chemical categories.

Multimedia releases of these chemicals must be quantified and reported as fugitive and point-source air emissions, discharges to water, underground injection, releases to land, and transfers to off-site locations. Accidental releases are aggregated into the release totals, by medium, if they occur. Reporting of waste minimization information has been voluntary through the calendar year 1990.

The chemical list is in a constant state of flux because chemicals are periodically listed and delisted. For example, nine chemicals have been listed (e.g., creosote, dinitrobenzenes, toluenediisocyanate) and eight have been delisted (e.g., titanium dioxide, sodium hydroxide solution, non-fibrous aluminum oxide), since the regulation was originally promulgated.

There are several exemptions related to specific types of facilities, materials, chemical uses, or chemicals present in mixtures below *de minimis* concentrations. Several additional reporting requirements have been proposed by U.S. EPA [5], which will be discussed later in this article.

Overview of the special issue

This special issue focuses on two separate but related aspects of SARA Title III: emergency planning and notification, and annual toxic chemical release reporting.

Emergency planning and notification

The burden for complying with the emergency planning and notification provisions of SARA Title III has been spread across the board. State agencies, local communities, and industry all have a distinct role in achieving compliance. The effort required can be extensive, associated costs can be burdensome, and a distinct level of expertise is required to ensure that emergency planning and hazard assessments, where warranted, are properly conducted.

State efforts to implement the provisions of SARA Title III have generally been successful. Aside from the establishment of SERCs, many states have implemented programs that, in several respects, exceed the basic requirements of SARA Title III. However, there are two key issues associated with the implementation of this program, including enforcement and funding [6]. Many states have taken actions to augment enforcement of the provisions of SARA Title III, typically through amendments to the respective right-to-know laws. However, there is typically a limited number of personnel available to monitor compliance. Generally, the effort required to ensure compliance often involves more than the immediately available community resources and, as a result, can be costly. These costs have led to the implementation of fee systems that are typically tied to required reporting of chemical hazard information (i.e., Sections 311 and 312) or toxic chemical release information.

The responsibility for meeting the requirements of SARA Title III ultimately resides at the local level. Local communities were required to establish LEPCs and develop emergency response plans. This has been a challenging effort because of the need to rely on the voluntary services of many participants, including local officials, interested citizens and professionals, and representatives from industry. Because one of the components of emergency planning for hazardous material incidents is to determine and quantify the potential hazards in the community, significant expertise is required to perform the necessary hazard assessments. Specific guidance for emergency planning and performing hazard assessments has been developed [7-10].

The manner in which communities embraced their new responsibilities and the issues that resulted was the subject of a recent study by Tufts University [11]. Four communities were surveyed (Springfield, MA; Texas City and Baytown, TX; Newark, NJ). The study determined that each community had functioning LEPCs, had completed required emergency plans on time, and were involved in enhancing the community's emergency response capabilities.

However, communication with the public was passive and mostly within the LEPCs or local environmental activist groups. In the latter case, instances arose where the local environmental groups pushed the LEPC and regulated facilities beyond emergency planning (e.g., long-term risk reduction, pollution prevention). There were limited activities in the area of risk communication.

The first article in this volume addresses emergency planning and describes a chemical risk data base and assessment system that was introduced by the city of Winterthur, Switzerland [12]. This tool was developed in order to identify facilities, hazardous substances, and situations that could pose a risk to the area and to develop safety measures for the priority cases. This approach and methodology could be used effectively in the U.S. for emergency planning as part of the SARA Title III program, as a basis for identifying and setting emergency response priorities.

Ultimately, industry plays a key role in the planning and notification process, and often must expend significant efforts and dollars to comply with these requirements. Besides industry's role as members of the LEPCs, facilities are required to provide the data necessary for the planning process. Consequently, they may be required to provide hazard assessment data, emergency plans and other pertinent information. The resulting effort can be substantial, particularly if a facility is large, handles many acutely hazardous chemicals, or is surrounded by a sizeable community.

The next article addresses the implications of SARA Title III on a facility's emergency notification and planning program [13]. Although the regulation does not require facilities to conduct their own emergency planning, emergency notification is required and participation of facilities in the community planning process is important for effective implementation of SARA Title III. This article demonstrates that proper facility planning is essential in developing effective notification procedures, and that responding to SARA Title III in a proactive manner involves many of the fundamental features of sound facility emergency response planning.

Annual toxic chemical release reporting

The most publicized and far-reaching requirement of SARA Title III has been the development and reporting of toxic chemical release information under Section 313. Many notable issues have arisen during the four years that reporting has been required, such as the substances on the toxic chemical list, the particulars of report preparation, trade secrets, the structure and use of the TRI data base, and, particularly, public response to the reported release quantities.

Considerable effort has been expended in both determining whether reporting was required and in the estimation of releases. In developing release estimates, many facilities have been concerned about the accuracy of these estimates and to what extent releases may be either under or over reported.

Although the regulation does not require that additional data be developed (i.e., through source monitoring), source monitoring has been used in many cases to either enable reporting or to improve accuracy and ensure that more accurate and less over-conservative release estimates are developed. Accurate estimates are difficult to develop for some sources, such as fugitive or secondary emissions, resulting in considerable effort to measure releases on facility-specific and industry-wide bases. Whether based on monitoring data or improved estimation methodologies, industry has worked to streamline the process to ensure that accurate estimates can be efficiently developed and reported for virtually any type of release.

Computer tools can be used as one means to streamline the reporting effort. Source-specific modular software products are available, such as EPA's model for predicting air emissions from hazardous waste treatment, storage, and disposal facilities [14]. Annual reviews of available environmental software are also routinely published (e.g., Pollution Engineering, [15]).

A useful procedure for streamlining the report effort is to develop a source- and facility-specific release inventory and a spreadsheet allowing the subsequent year's inventories to be more easily developed and updated. The spreadsheet method standardizes the estimation process, is self documenting, and easily accommodates changes to sources and estimating methodologies. This spreadsheet method can also be tailored to different facility configurations. This concept has previously been applied in the iron and steel industry [16] and is the subject of the third article in this series [17]. This article describes a methodology that uses source-specific emission factors in a computerized multi-spreadsheet model to facilitate annual reporting of releases from petroleum refining operations.

Although the initial public response to the reported data was somewhat muted, strong reactions have occurred in the ensuing years through extensive media coverage. Newspapers across the U.S. typically reported their lists of top polluters shortly after each year's Form Rs were submitted. These reports documented chemical releases both totally and by chemical, providing specific company names and facility locations.

In addition, analysis of the data submitted in the annual TRI have been published by various environmental groups and State agencies. Environmental groups have frequently identified companies, facilities and locations that emit the largest quantities of toxic chemicals. Examples of some of these reports include:

- "Discharge Reduction Scorecard: Baseline Report, 1987-1988," [18];
- "A Who's Who of American Toxic Air Polluters," NRDC [19];
- "Danger Downwind — A Report on the Release of Billions of Pounds of Toxic Air Pollutants," National Wildlife Federation [20];

- “Poisons in Our Neighborhoods: Toxic Pollution in the United States” [21];
 - “Phantom Reductions: Tracking Toxic Trends,” National Wildlife Federation [22];
 - “The Recycling Loophole in the Toxics-Release Inventory-Out of Site, Out of Mind” [23]; and
 - “Manufacturing Pollution: A Survey of the Nation’s Toxic Polluters” [24,25].
- The publicity provided by these reports underscores the need for companies to both develop accurate and defensible release estimates and to ensure that compliance with the law is achieved.

In some cases, State regulatory agencies have also taken the initiative to utilize, monitor, and report the TRI data. State reporting tends to be more objective, taking the form of a demographic summary of the data [26,27]. The fourth article in this issue addresses compilation and use of the TRI data from 1987 and 1988 by the California Environmental Affairs Agency (Hanna et al. [28]). All data were entered into a microcomputer data base and subsequently evaluated. This initial assessment indicated that a large fraction of the total amount of chemicals released could be attributed to a few chemicals, industry types, or specific facilities.

Finally, many facilities made special efforts to voluntarily provide more detailed information to their communities on the nature and implications of the reported releases. As reported, the TRI data provide no indication of whether and to what extent health impacts could be anticipated. Many companies bridged that gap by performing ambient impact studies and assessments of health risks that might arise from releases. The last article in this series provides an example of an approach to conducting an off-site impact assessment of airborne releases [29]. Based on worstcase conditions, a sequence of steps is utilized to screen releases, so that priority releases/impacts can be identified for more refined dispersion modeling and risk assessment. This approach can be useful in setting source- and chemical-specific emission reduction priorities, as well as one means of assessing emergency response priorities and procedures.

Future outlook and implications

Compliance with the requirements of SARA Title III requires an ongoing commitment by industry. Not only will facilities have to comply with current regulations, but efforts are underway to expand the scope of the required reporting in several areas:

- reporting data to address the recycling, treatment, and reduction of waste;
- reporting peak release data;
- adding new chemicals to the list of reportable substances; and

- reporting for additional industrial sectors.

Some of these potential requirements are predicated on recommendations from the General Accounting Office [30]. Waste reduction related reporting is already required, as defined in the Pollution Prevention Act of 1990.

The U.S. Environmental Protection Agency has proposed expanded reporting requirements for pollution prevention information to be phased in during the 1991 and 1992 reporting years [5]. This proposed change has not yet been finalized, and, in fact, may be modified by EPA to encompass less information than initially proposed. However, if this reporting requirement remains unchanged from that proposed, companies that must comply with Section 313 reporting requirements would have to provide information on the Form R to document:

- quantity of each toxic chemical entering any waste stream or otherwise released to the environment before recycling/treatment/disposal during the calendar year; the percentage change from the previous year; and estimates for the following two years.
- amount of each toxic chemical that is recycled at the facility or elsewhere; the percent change from the previous year; estimates for the following two years; and the recycling processes used.
- amount of each toxic chemical that is treated at the facility or elsewhere during the year and the percent change from the previous year.
- quantity of each chemical released into the environment as the result of a catastrophic event, remedial action or other one-time event not associated with production processes.
- information on source reduction activities and the methods used to identify those activities (e.g., employee recommendations, external and internal audits, participatory team management, and material balance audits.)
- ratio of current: previous year chemical production or activity index.

For calendar year 1992 and beyond, EPA may require additional data including:

- changes in accounting practices, estimation methods, or other factors;
- indication if on-site recycling equipment or capacity was added during the reporting year;
- RCRA hazardous wastes affected by source reduction activities;
- other TRI chemicals affected by source reduction activities; and
- more detailed information about on-site treatment and recycling (e.g., waste streams affected, recycling methods, amount recycled with each method).

This could translate into yet another significant effort by industry to compile and report data related to waste/release reduction and pollution prevention. However, EPA has not yet finalized the proposed rule at the time this article was written. The OMB rejected EPA's TRI reporting package for 1991 and EPA is developing a new format for the Form R to be resubmitted to OMB [31].

SARA Title III can undoubtedly be viewed as a major landmark in U.S. environmental legislation. This initially controversial statute has had a profound impact on the course of community emergency planning and, in particular, on the dialogue between industry, regulatory agencies and the public regarding toxic chemical releases. The TRI is widely regarded as a data base of fundamental importance for many purposes. The implications of the release reporting requirements have probably been even more far reaching than the requirements themselves. Industry has made significant inventory reductions of certain highly toxic substances to reduce risk levels. Stricter procedures have been introduced at many facilities for purchase and control of any regulatory listed substance. Companies have striven to reduce releases and introduce more proactive environmental management practices. States have taken the toxic chemical list as a basis for pollution prevention legislation. Multi-national corporations are making similar disclosures in other countries, influencing environmental programs on a global scale.

A number of developments emanating from SARA Title III are either still ongoing or can be expected. The community emergency planning effort is certainly only part of the way along a long path. Improvements need to be made, for example, in the manner in which transportation hazards can be identified and assessed. Coordination of planning for toxic substance and fire and explosion emergencies needs to be further addressed. The impact of the TRI will be magnified once the greater volume of data generated by the requirements of the Pollution Prevention Act become available. Publication of these data will inevitably encourage the present trend to examine the source of wastes and releases rather than quantities after controls or treatment, thereby speeding up the introduction of cleaner technologies.

In summary, SARA Title III is a firmly implanted regulatory program that requires compliance by a wide spectrum of industry. Reporting will continue into the foreseeable future and, if anything, will become progressively more onerous. EPA's current and anticipated use of the data underscores the need for industry to pay close attention to the accuracy and reasonableness of the data to be reported. The public's access to the data accentuates this need and suggests that industry should continue to take a proactive approach to communicating both the data and their significance.

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Glossary

- AEC** Atomic Energy Act
- AIHA** American Industrial Hygiene Association
- ARIP** Accidental Release Information Program
- CAS** Chemical Abstract Service
- CERCLA** Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (a.k.a. Superfund)
- CFR** Code of Federal Regulations
- De Minimis** The concentration below which a chemical, as part of a mixture or trade-name product, does not have to be considered for reporting under Section 312 or 313 of SARA Title III. The *de minimis* levels are 1.0% or 0.1% if a chemical is a non-carcinogen or carcinogen, respectively, as defined by OSHA
- Dose Response Assessment** Determination of the relation between magnitude of exposure and the potential for specific health outcomes for each pollutant

DP Damage Potential

EHS (Extremely Hazardous Substance) A substance listed under 40 CFR part 255 Appendices A and B. The emergency planning, emergency release notification and hazardous chemical reporting provisions of Title III all make reference to EHSs

ERPGs Emergency Response Planning Guidelines

Exposure Assessment The qualitative and quantitative determination of the amount of a foreign entity a person or population comes into contact with

FIFRA Federal Insecticide, Fungicide, and Rodenticide Act

Hazard Identification The qualitative indication that a substance or condition may adversely affect human health

Hazardous Chemical Any substance that meets the OSHA health hazard or physical hazard definitions under the Hazard Communication Standard, 29 CFR § 1910.1200. The hazardous chemical reporting provisions of Title III make reference to hazardous chemicals

Hazardous Substance A substance listed or designated as a CERCLA hazardous substance under 29 CFR § 302.4. The emergency release notification provisions of Title III make reference to CERCLA hazardous substances

HCS (Hazard Communication Standard) 29 CFR § 1910.1200 of the Occupational Safety and Health Act

IDLH (Immediately Dangerous to Life and Health) Maximum level from which one could escape within 30 minutes without any escape-impairing symptoms or irreversible health effects

ISC Industrial Source Complex — EPA Model

LDRP Leak Detection and Repair Program

LEPC (Local Emergency Planning Committee) Community body required to be established by Title III. LEPC functions include community emergency planning, data management and information dissemination to the public. LEPCs are granted specific authorities under Title III. Committee members include state and local officials, emergency response, health, environmental, and transportation personnel, new media, community groups, and industry representatives

MSDS (Material Safety Data Sheet) Written or printed material concerning a hazardous chemical prepared in accordance with the Hazard Communication Standard, 29 CFR § 1910.1200

NRC National Research Council

NRC National Response Center, as defined under CERCLA/SARA

NWS National Weather Service

OSHA Occupational Safety and Health Act/Administration

POTW Publicly Owned Treatment Works

RAM Random Access Memory

RCRA Resource Conservation and Recovery Act

Risk Assessment/Characterization The qualitative or quantitative estimation

of the likelihood of adverse effects that may result from exposure to specific health hazards or as a result of the absence of beneficial influences

RQ (Reportable Quantity) The amount of a substance that triggers reporting requirements under Title III and CERCLA/Clean Water Act. Reportable Quantities are listed or defined in 40 CFR Part 355 and 40 CFR § 302.4

SARA Superfund Amendments and Reauthorization Act of 1986

Section 302 The Section of the Title III Statute that identifies EHSs and the emergency planning notification requirement

Section 303 The Section of the Title III Statute that requires preparation of community emergency response plans

Section 304 The Section of the Title III Statute that defines emergency release notification requirements

Section 311 The Section of the Title III Statute that defines hazardous chemical reporting requirements

Section 312 The Section of the Title III Statute that defines annual hazardous chemical inventory reporting requirements

Section 313 The Section of the Title III Statute that defines annual toxic chemical release inventory reporting requirements

SERC (State Emergency Response Commission) State organization established according to Title III. The duties of the SERC include the establishment of LEPCs and procedures for receiving and processing information

SIC Standard Industrial Classification

SQL Structural Query Language

Superfund Federal legislation designed to pay for cleanup, containment, and damages to natural resources caused by the release of hazardous substances into the environment (a.k.a. CERCLA).

Title III The Emergency Planning and Community Right-to-Know Act of 1986 (Title III of SARA)

TPQ (Threshold Planning Quantity) A quantity of an Extremely Hazardous Substance present at a facility that triggers certain requirements under Title III. The emergency planning and hazardous chemical reporting provisions of Title III make reference to EHSs

TRI Toxic Release Inventory

TRIS Toxic Release Inventory System

TSCA Toxic Substances Control Act

U.S. EPA Chemical Emergency Preparedness Program Designed to address accidental releases of toxic substances to air

VOC Volatile Organic Compound