

Louisiana Toxic Substance Incidents Program (LaTSIP)

2010 - 2013: A Summation Report

Louisiana Department of Health and Hospitals
Office of Public Health
Section of Environmental Epidemiology & Toxicology



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This public document was published in-house. This document was published by the Department of Health and Hospitals, Office of Public Health, Section of Environmental Epidemiology and Toxicology to report the 2013 Louisiana Toxic Substance Incidents Program (LaTSIP) Program results. This material was printed according to standards for printing by state agencies established pursuant to R.S. 43:31.

This document was supported by Cooperative Agreement 5U61TS000128 from the Agency for Toxic Substances and Disease Registry (ATSDR). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of ATSDR.

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EXECUTIVE SUMMARY

The National Toxic Substance Incidents Program (NTSIP) system, funded by the Agency for Toxic Substances and Disease Registry (ATSDR), actively collects information to describe the public health consequences of acute releases of toxic substances in participating states. The Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental Health Services, Section of Environmental Epidemiology and Toxicology has participated in this surveillance system since its creation in 2010 and with this program's predecessor since 2001. This report summarizes the characteristics of events reported in Louisiana during the years of 2010 - 2013. Information about acute events involving toxic substances was collected, including the substance(s) released, number of victims, number and types of injuries, and number of evacuations. The data were computerized using an ATSDR-provided web-based data entry system.

During the years of 2010 through 2013, 2715 events met the NTSIP surveillance definition in Louisiana. In 2408 (88.7%) events, only one substance was released. The most commonly reported categories of substances were volatile organic compounds, acids, and other (not belonging to one of the existing categories). During this reporting period, 200 events (8.3%) resulted in a total of 352 victims. The most frequently reported injuries were respiratory system problems and chemical burns. Evacuations were ordered for 193 (7.1%) events.

INTRODUCTION

The National Toxic Substance Incidents Program (NTSIP) is designed to protect people from harm caused by spills and leaks of toxic substances. The program is funded by the Centers for Disease Control and Prevention (CDC) / Agency for Toxic Substances and Disease Registry (ATSDR) and modeled partially after the Hazardous Substance Emergency Events Surveillance Program (HSEES, 1990-2009), the program that NTSIP was designed to replace. The Louisiana Department of Health and Hospitals, Office of Public Health, Center for Environmental Health Services, Section of Environmental Epidemiology and Toxicology participated in HSEES from 2001-2009 and in NTSIP since its creation in 2010. The Louisiana Toxic Substance Incidents Program (LaTSIP) collects information about chemical spills and maintains it in a centralized database. Trends in data can then be analyzed to develop approaches to minimize risk to public health.

From 1990 - 2009, the Agency for Toxic Substances and Disease Registry (ATSDR) maintained an active, state-based HSEES system to describe the public health consequences of releases of hazardous substances. The decision to initiate a surveillance system of this type was based on a study published in 1989 about the reporting of hazardous substances releases to three national databases: the National Response Center Database, the Hazardous Material Information System (HMIS), and the Acute Hazardous Events Database¹.

A review of these databases indicated limitations. Many events were missed because of specific reporting requirements (for example, the HMIS did not record events involving intrastate carriers or fixed-facility events). Other important information was not recorded, such as the demographic characteristics of victims, the types of injuries sustained, and the number of persons evacuated.

As a result of this review, ATSDR implemented the HSEES system to more fully describe the public health consequences of releases of hazardous substances. In 2010, NTSIP was formed to replace HSEES as a more comprehensive program by incorporating stakeholder suggestions. NTSIP has three components: National Database, State Partners, and Response Teams. Between 2010 and 2012, seven state health departments collected data for NTSIP: Louisiana, New York, North Carolina, Oregon, Tennessee, Utah, and Wisconsin. In 2013, Oregon stopped data collection; however, California and Missouri began collecting data.

LaTSIP has three goals: to describe toxic substance releases and the public health impact associated with such releases, to identify vulnerabilities in industry, transportation, and communities as they relate to toxic releases, and to promote the use of inherently safer technologies that could prevent exposures to toxic releases and subsequent health effects. These goals are intended to provide industry, responders, and the general public with information that can help prevent chemical releases and reduce morbidity and mortality if a release occurs.

This report provides an overview of LaTSIP during the years of 2010 - 2013, summarizes the characteristics of acute releases of toxic substances and their associated public health consequences, and demonstrates how data from the system are translated into prevention activities to protect public health.

METHODS

Detailed information was collected about each toxic substance incident, including substance(s) released, victims, injuries (adverse health effects and symptoms), and evacuations. Various data sources were used to obtain information about these events. These sources included the Louisiana Department of Public Safety and Corrections, Office of State Police, the Louisiana Department of Environmental Quality (LDEQ), the U.S. Coast Guard National Response Center, and the U.S. Department of Transportation, Hazardous Materials Information System (HMIS). Census data were used to estimate the number of residents in the vicinity of most of the events. All data were computerized using a web-based data entry system provided by ATSDR.

A NTSIP event is defined as **an uncontrolled or illegal acute release of any toxic substance**, in any amount for substances listed on the NTSIP Mandatory Chemical Reporting List, or, if not on the list, in an amount greater than or equal to 10 lbs or 1 gallon. Petroleum only incidents, as well as stack or flare incidents are included only when there is a public health action or an injury caused by the chemical. NTSIP defines victims as people who experience at least one documented adverse health effect within 24 hours after the event or who die as a consequence of the event. Victims who receive more than one type of injury or symptom are counted once in each applicable injury type or symptom. Events are defined as transportation related if they occur (a) during surface, air, pipeline, or water transport of hazardous substances, or (b) before being totally unloaded from a vehicle or vessel. All other events are considered fixed-facility events.

For data analyses, the substances released were categorized into 15 groups. The category “mixture” comprises substances from different categories that were mixed or formed from a reaction before the event; the category “other inorganic substances” comprises all inorganic substances except acids, bases, ammonia, and chlorine; and the category “other” comprises substances that could not be grouped into one of the other existing categories.

RESULTS

Between 2010 and 2013, a total of 2715 acute toxic substances events met the LaTSIP surveillance definition; 1882 (69.3%) events occurred in fixed facilities. The parishes with the most events (Table 1) were East Baton Rouge (481 [17.7%]), Calcasieu (290 [10.7%]), and Ascension (287 [10.6%]).

Table 1: Number of Events Meeting the Surveillance Definition, by Parish and Type of Event - Louisiana Toxic Substances Emergency Events Surveillance, 2010 - 2013

Parish	Type of Event				All Events	
	Fixed Facility		Transportation		No. Events	%*
	No. Events	%*	No. Events	%*		
Acadia	12	1.4	13	0.7	25	0.9
Allen	4	0.5	4	0.2	8	0.3
Ascension	53	6.4	234	12.4	287	10.6
Assumption	0	0	4	0.2	4	0.1
Avoyelles	1	0.1	4	0.2	5	0.2
Beauregard	3	0.4	12	0.6	15	0.6
Bienville	0	0	2	0.1	2	0.1
Bossier	30	3.6	13	0.7	43	1.6
Caddo	142	17.0	60	3.2	202	7.4
Calcasieu	61	7.3	229	12.2	290	10.7
Caldwell	1	0.1	1	0.1	2	0.1
Cameron	2	0.2	4	0.2	6	0.2
Catahoula	0	0	1	0.1	1	0
Claiborne	2	0.2	2	0.1	4	0.1
Concordia	1	0.1	0	0	1	0
De Soto	12	1.4	19	1.0	31	1.1
E. Baton Rouge	76	9.1	405	21.5	481	17.7
E. Carroll	1	0.1	1	0.1	2	0.1
E. Feliciana	0	0.0	3	0.2	3	0.1
Evangeline	3	0.4	8	0.4	11	0.4
Franklin	1	0.1	1	0.1	2	0.1
Grant	No NTSIP Events					
Iberia	5	0.6	10	0.5	15	0.6
Iberville	34	4.1	168	8.9	202	7.4
Jackson	3	0.4	3	0.2	6	0.2
Jefferson	38	4.6	63	3.3	101	3.7
Jefferson Davis	6	0.7	3	0.2	9	0.3
Lafayette	38	4.6	42	2.2	80	2.9
LaFourche	11	1.3	16	0.9	27	1.0
La Salle	1	0.1	0	0	1	0
Lincoln	5	0.6	0	0.0	5	0.2
Livingston	2	0.2	14	0.7	16	0.6
Madison	3	0.4	2	0.1	5	0.2
Morehouse	2	0.2	7	0.4	9	0.3
Natchitoches	4	0.5	12	0.6	16	0.6
Orleans	61	7.3	42	2.2	103	3.8

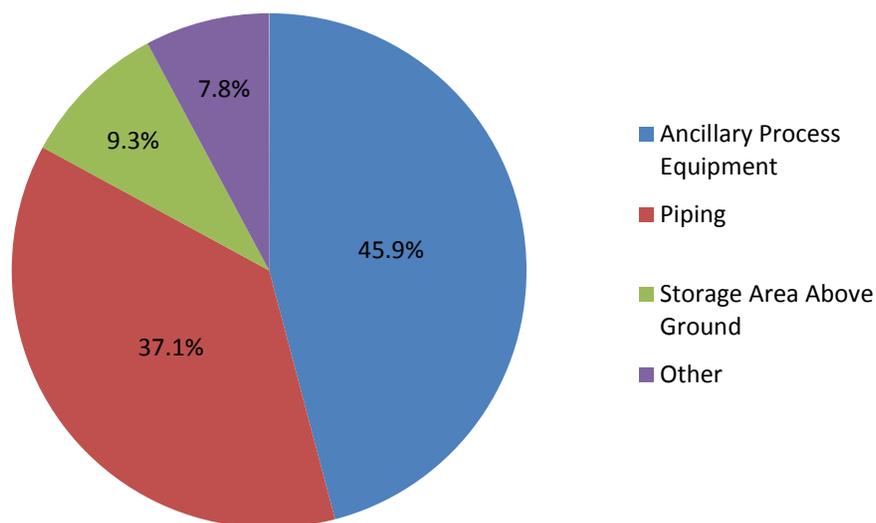
Parish	Type of Event				All Events	
	Fixed Facility		Transportation			
	No. Events	%*	No. Events	%*	No. Events	%*
Ouachita	19	2.3	34	1.8	53	2.0
Plaquemines	9	1.1	26	1.4	35	1.3
Pointe Coupee	18	2.2	7	0.4	25	0.9
Rapides	27	3.2	25	1.3	52	1.9
Red River	2	0.2	7	0.4	9	0.3
Richland	4	0.5	4	0.2	8	0.3
Sabine	3	0.4	2	0.1	5	0.2
St. Bernard	13	1.6	47	2.5	60	2.2
St. Charles	28	3.4	92	4.9	120	4.4
St. Helena	0	0	2	0.1	2	0.1
St. James	10	1.2	61	3.2	71	2.6
St. John the Baptist	16	1.9	47	2.5	63	2.3
St. Landry	4	0.5	5	0.3	9	0.3
St. Martin	7	0.8	7	0.4	14	0.5
St. Mary	5	0.6	5	0.3	10	0.4
St. Tammany	5	0.6	12	0.6	17	0.6
Tangipahoa	6	0.7	21	1.1	27	1.0
Tensas	No NTSIP Events					
Terrebonne	4	0.5	12	0.6	16	0.6
Union	0	0	2	0.1	2	0.1
Vermilion	4	0.5	12	0.6	16	0.6
Vernon	3	0.4	1	0.1	4	0.1
Washington	0	0	3	0.2	3	0.1
Webster	7	0.8	4	0.2	11	0.4
W. Baton Rouge	20	2.4	33	1.8	53	2.0
W. Carroll	0	0.0	4	0.2	4	0.1
W. Feliciana	1	0.1	3	0.2	4	0.1
Winn	0	0	2	0.1	2	0.1
Total	833	99.9	1882	100.1	2715	99.7

* Percentage = (number of events by type of event per parish ÷ total number of events) x 100

‡ Percentages do not total 100% because of rounding.

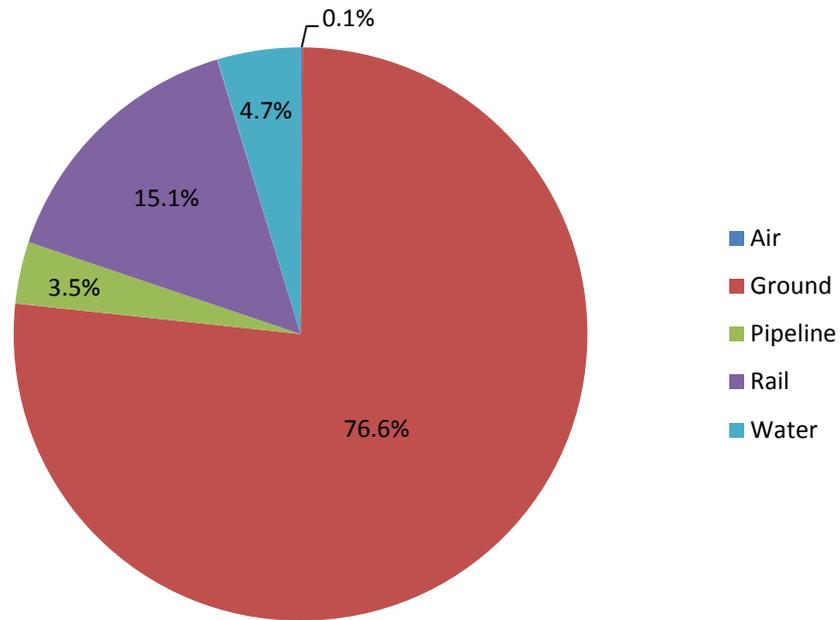
For each of the 1274 fixed-facility event occurring in mining, manufacturing, or utilities, one or two choices can be selected to describe the type of area where the event occurred or the equipment involved with the event. Only one type of area was reported for 896 (70.3%) fixed facility events, a combination of two area types were reported for 374 (29.4%). Four events occurred at an unknown location. Among events with one type of area reported, the main areas were classified as follows: 411 (45.9%) ancillary process equipment, 332 (37.1%) piping, and 83 (9.3%) storage area above ground (Figure 1). Material handling areas, process vessels, transportation within the fixed facility, transformers or capacitors, incinerators, laboratories, and waste areas constituted the remaining 70 (7.8%) events.

Figure 1: Primary Areas or Equipment of Fixed Facilities Involved in Mining, Manufacturing, or Utility Events Where Only One Type of Area was Reported - Louisiana Toxic Substance Incidents Program, 2010 - 2013



Of the 833 transportation-related events, most (638 [76.6%]) occurred during ground transport (e.g., truck, van, or tractor) (Figure 2). The largest proportions of transportation-related events occurred during unloading of a stationary vehicle / vessel (241 [28.9%]) or occurred from a moving vehicle or vessel (216 [25.9%]).

Figure 2: Distribution of Transportation - Related Events, by Type of Transport - Louisiana Toxic Substance Incidents Program, 2010 - 2013



Primary and secondary factors contributing to the events were reported for all events (Figures 3a and b). Most (71.0%) fixed-facility events reported equipment failure as the primary factor, and most (34.9%) transportation-related events reported human error as the primary factor. Secondary factors were reported for 238 (8.8%) events (Figure 3b). Equipment failure was the most commonly reported secondary factor for both fixed facility and transportation events, accounting for 83.2% of fixed facility events and 93.4% of transportation events.

Figure 3a: Primary Factors Reported as Contributing to Events - Louisiana Toxic Substance Incidents Program, 2010 - 2013

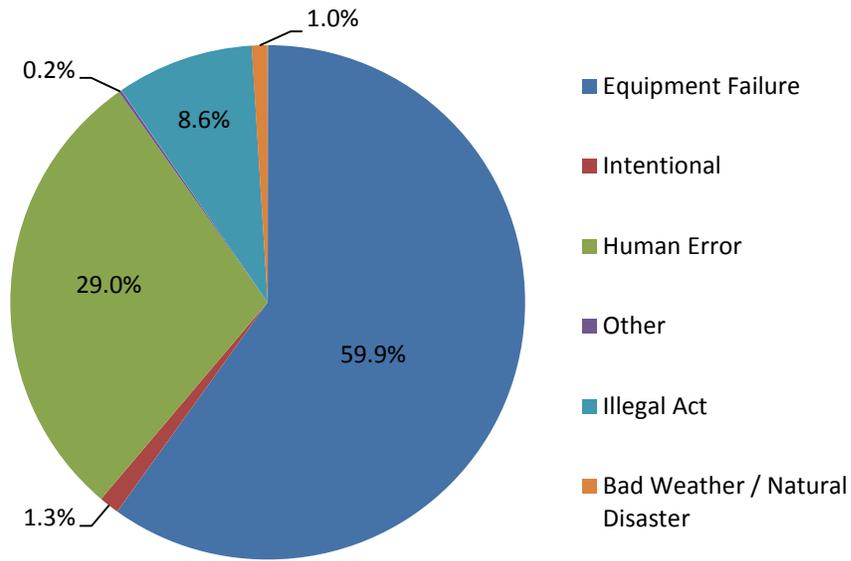
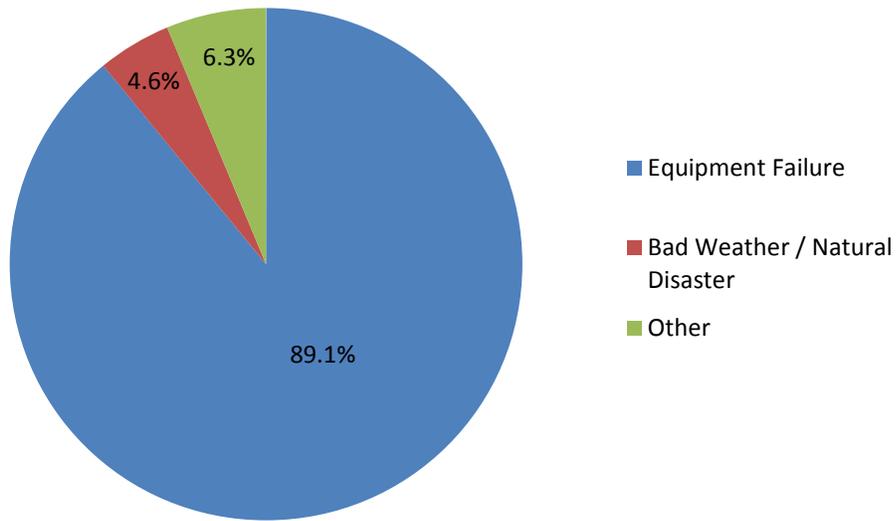


Figure 3b: Secondary Factors Reported as Contributing to Events – Louisiana Toxic Substance Incidents Program, 2010 - 2013



Over 88% of all events involved the release of only one substance. Two substances were released in 6.8% of the events, and 4.4% involved the release of more than two substances (Table 2). Fixed-facility events were more likely than transportation events to have two or more substances released in an event (15.0% vs. 2.9%).

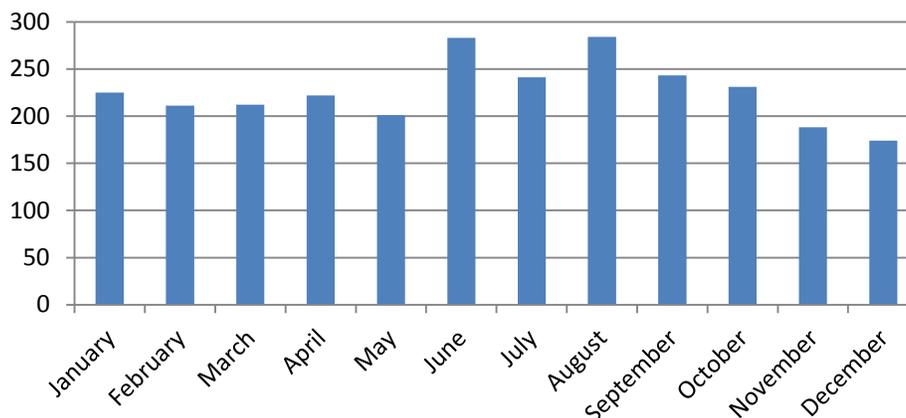
Table 2: Number of Substances Involved per Event, by Type of Event - Louisiana Toxic Substance Incidents Program, 2010 - 2013

No. Substances	Type of Event						All Events		
	Fixed Facility			Transportation					
	No. Events	%*	Total Substances	No. Events	%*	Total Substances	No. Events	%*	Total Substances
1	1599	85.0	1599	809	97.1	809	2408	88.7	2408
2	166	8.8	332	19	2.3	38	185	6.8	370
3	57	3.0	171	3	0.4	9	60	2.2	180
4	22	1.2	88	1	0.1	4	23	0.8	92
≥ 5	38	2.0	249	1	0.1	7	39	1.4	256
Total	1882	100.0	2439	833	100.0	867	2715	99.9	3306

*Percentages may not total 100% because of rounding.

LaTSIP events were more likely to occur in industrial areas as opposed to commercial, residential or agricultural areas (for events where only 1 area was selected). In addition, for LaTSIP events where the time was known, LaTSIP events were more likely to occur in the 6 hours before noon (36.9%) and the 6 hours after and including noon (30.2%), compared with the 6 hours before midnight (16.7%) and the 6 hours after and including midnight (16.2%). Additionally, 15.0% – 18.3% of events occurred on each weekday as compared with 7.3% - 9.8% on a weekend day. The highest number of events occurred in August (284 [10.5%]) and June (283 [10.4%]) (Figure 4).

Figure 4: Monthly Breakdown of LaTSIP Events for Calendar Years 2010 - 2013 - Louisiana Toxic Substance Incidents Program, 2010 - 2013



Industries

The largest proportions of LaTSIP events were associated with the manufacturing (1244 [45.8%]) and transportation / warehousing (736 [27.1%]) industries (Table 3). The industry with largest number of events with victims was the manufacturing industry (74 [37.0%]). Additionally, there were 37 (18.5%) events with victims where an industry was not involved (ex. methamphetamine manufacturing) or the industry was not identified.

The total number of victims was greatest in the “*Manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone)*” industry (170 [48.3%]) followed by the number of victims in the “*Transportation and Warehousing I*” industry (58 [16.5%]). Of the events where the industry was identified, the “*Manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone)*” industry resulted in a large proportion of events with victims and the largest number of victims; however, only 5.9% of all 1222 events in that category resulted in victims. Conversely, 50.0% of events in the “*Arts, Entertainment, and Recreation*” industry resulted in victims; however, this industry represents a small proportion (0.3%) of events with victims. Two events within the “*Manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone)*” industry resulted in more than 10 injuries.. In one event, a standby re-boiler ruptured creating a vapor cloud that was ignited, causing the death of 2 workers. A total of 114 people were treated at local hospitals; however, only 17 reported symptoms that qualified for inclusion into the NTSIP database. In a second event, a fire and subsequent explosion forced the evacuation of a chemical facility. A major interstate highway was also shut down. Twenty-five people reported symptoms such as headaches, respiratory issues, or shortness of breath related to the event.

**Table 3: Industries Involved in Toxic Substance Events and Events with Victims, by Category
- Louisiana Toxic Substance Incidents Program, 2010 - 2013**

Industry Category	Total Events		Events with Victims		Percentage of Events with Victims	Total Number of Victims (Maximum)^
	Number	%*	Number	%*	%*	
Accommodation and Food Services	2	0.1	0	0	0	0
Administrative and Support and Waste Management and Remediation Services	30	1.1	0	0	0	0
Agriculture, Forestry, Fishing and Hunting	7	0.3	0	0	0	0
Arts, Entertainment, and Recreation	2	0.1	1	0.5	50.0	1 (1)
Construction	43	1.6	6	3.0	14.0	9 (2)
Educational Services	10	0.4	1	0.5	10.0	1 (1)
Finance and Insurance	No LaTSIP Events					
Health Care and Social Assistance	10	0.4	3	1.5	30.0	7 (4)
Information	2	0.1	0	0	0	
Management of Companies and Enterprises	No LaTSIP Events					
Manufacturing (Food, Textile, Apparel)	8	0.3	1	0.5	12.5	1 (1)
Manufacturing (Metal, Electrical, Transport, Professional)	14	0.5	1	0.5	7.1	3 (3)
Manufacturing (Paper, Printing, Chemicals, Petroleum, Leather, Lumber, Stone)	1222	45.0	72	36.0	5.9	170 (25)
Mining	52	1.9	7	3.5	13.5	8 (2)
Not an Industry / Not Identified / Unknown	293	10.8	37	18.5	12.6	47 (2)
Other Services (except Public Administration)	5	0.2	1	0.5	20.0	1 (1)
Professional, Scientific, and Technical Services	19	0.7	5	2.5	26.3	5 (1)
Public Administration	16	0.6	2	1.0	12.5	6 (5)
Real Estate and Rental and Leasing	2	0.1	0	0	0	0
Retail Trade I	8	0.3	2	1.0	25.0	2 (1)
Retail Trade II	11	0.4	3	1.5	27.3	6 (3)
Transportation and Warehousing I	701	25.8	40	20.0	5.7	58 (6)
Transportation and Warehousing II	35	1.3	3	1.5	8.6	4 (2)
Utilities	66	2.4	3	1.5	4.5	5 (3)
Wholesale Trade	157	5.8	12	6.0	7.6	18 (4)
Total	2715	100.2	200	100.0	-	352 (25)

^Minimum number of victims per event = 1.

* Total percentage may not equal 100 due to rounding

Substances

A total of 3306 substances were released in all events. The individual substances most frequently released were Methamphetamine Chemicals NOS and Hydrochloric Acid (Appendix). Substances were grouped into 15 categories. The substance category most commonly released in fixed-facility events were volatile organic compounds (917 [37.6%]), while in transportation-related events, the most common substance categories released were acids (217 [25.0%]).

Two types of releases for each substance (e.g., spill and air) could be reported. Of the 3306 substances released, 223 (6.7%) substances involved more than one release type such as a liquid spill or a volatilization of a gas.

Table 4: Number of Substances Involved, by Substance Category and Type of Event - Louisiana Toxic Substance Incidents Program, 2010 - 2013

Substance Category	Type of Event				All Events	
	Fixed facility		Transportation		No. Substances	%*
	No. Substances	%*	No. Substances	%*		
Acids	225	9.2	217	25.0	442	13.4
Agricultural Chemicals and Pesticides	83	3.4	33	3.8	116	3.5
Ammonia	87	3.6	11	1.3	98	3.0
Bases	82	3.4	126	14.5	208	6.3
Chlorine	95	3.9	14	1.6	109	3.3
Formulations	4	0.2	2	0.2	6	0.2
Hetero-Organics	51	2.1	22	2.5	73	2.2
Hydrocarbons	80	3.3	19	2.2	99	3.0
Mixture§	34	1.4	17	2.0	51	1.5
Other†	319	13.1	60	6.9	379	11.5
Other Inorganic Substances‡	314	12.9	64	7.4	378	11.4
Oxy-Organics	48	2.0	30	3.5	78	2.4
Paints and Dyes	1	0.0	8	0.9	9	0.3
PCB's	2	0.1	0	0.0	2	0.1
Polymers	91	3.7	32	3.7	123	3.7
Undetermined	6	0.3	12	1.4	18	0.5
Volatile Organic Compounds	917	37.6	200	23.1	1117	33.8
Total	2439	100.0	867	100.0	3306	100.0

§Substances from different categories that were mixed or formed from a reaction before the event.

†Not belonging to one of the existing categories.

‡All inorganic substances except for acids, bases, ammonia, and chlorine

* Total percentage may not equal 100 due to rounding

Victims

A total of 352 victims were involved in 200 events (7.4% of all events) (Table 5). Of the 200 events with victims, 136 (68.0%) events involved only one victim, and 37 (18.5%) involved two victims. Of all victims, 273 (77.6%) were injured in fixed-facility events.

Table 5: Number of Victims per Event, by Type of Event - Louisiana Toxic Substance Incidents Program, 2010 - 2013

No. Victims	Type of Event						All Events		
	Fixed facility			Transportation			No. Events	%*	Total Victims
	No. Events	%*	Total Victims	No. Events	%*	Total Victims			
1	95	66.0	95	41	73.2	41	136	68.0	136
2	27	18.8	54	10	17.9	20	37	18.5	74
3	12	8.3	36	4	7.1	12	16	8.0	48
4	4	2.8	16	0	0.0	0	4	2.0	16
=> 5	6	4.2	72	1	1.8	6	7	3.5	78
Total	144	100.1	273	56	100.0	79	200	100.0	352

*Total percentage may not equal 100 due to rounding

To represent the magnitude of the effects of substances involved in injuries, the number of events in a specific substance category was compared with the number of events in the same category that resulted in victims. In events that involved one or more substances from the same substance category, substances were counted once in that category. In events that involved two or more substances from different categories, substances were counted once in the multiple substance category. Substances released most often were not necessarily the most likely to result in victims (Table 6). For example, events categorized as volatile organic compounds constituted 25.7% of all events; however, only 4.3% of these events resulted in injuries. Conversely, events involving formulations accounted for 3.7% of all events, but 33.3% of these events resulted in injuries. Employees (267 [75.9%]) constituted the largest proportion of the population groups injured, followed by members of the general public (73 [20.7%]) (Figure 5).

Table 6: Frequency of Substance Categories in All Events and Events with Victims - Louisiana Toxic Substance Incidents Program, 2010 - 2013

Substance Category	All Events		Events with Victims		
	No.	%*	No.	Percentage of all Releases with Victims*	Percentage of Events with Victims in Substance Category
Acids	377	13.9	27	13.5	7.2
Agricultural Chemicals and Pesticides	87	3.2	4	2.0	4.6
Ammonia	91	3.4	6	3.0	6.6
Bases	197	7.3	22	11.0	11.2
Chlorine	100	3.7	14	7.0	14.0
Formulations	6	0.2	2	1.0	33.3
Hetero-organics	53	2.0	4	2.0	7.5
Hydrocarbons	78	2.9	4	2.0	5.1
Mixture Across Chemical Category [†]	44	1.6	4	2.0	9.1
Multiple Substance Category**	194	7.1	18	9.0	9.3
Other [‡]	345	12.7	46	23.0	13.3
Other Inorganic Substances [§]	272	10.0	12	6.0	4.4
Oxy-organics	60	2.2	5	2.5	8.3
Paints and Dyes	7	0.3	1	0.5	14.3
PCB's	1	0.0	0	0.0	0.0
Polymers	87	3.2	1	0.5	1.1
Indeterminate/Unknown	17	0.6	0	0.0	0.0
Volatile Organic Compounds	699	25.7	30	15.0	4.3
Total	2715	100.0	200	100.0	7.4

*Total percentage may not equal 100 due to rounding

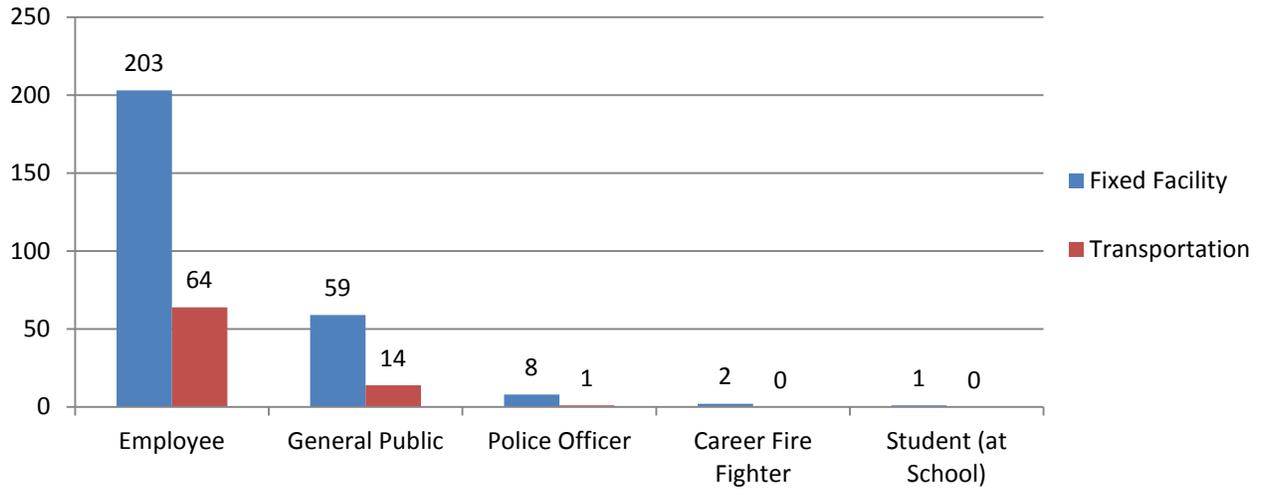
**Substances in events that involved multiple substances were counted only once in a substance category when all the substances were associated with the same category. If events involved multiple substances from different substance categories, they were counted only once in the multiple substance category.

[†]Substances from different categories that were mixed or formed from a reaction before the event.

[‡]Not classified.

[§]All inorganic substances except for acids, bases, ammonia, and chlorine.

Figure 5: Number of Victims, by Population Group and Type of Event - Louisiana Toxic Substance Incidents Program, 2010 - 2013



Victims were reported to have sustained a total of 415 injuries or symptoms (Table 7). Some victims had more than one injury or symptom. Of all reported injuries/symptoms, the most common in fixed-facility events were respiratory system problems (89 [27.5%]), chemical burns (40 [12.3%]) and thermal burns (35 [10.8%]). In addition, there were an additional 8 burns (2.5%) that were either both thermal and chemical in origin or unknown in origin. In transportation-related events, non-chemical related trauma (28 [30.8%]) and chemical burns (21 [23.1%]) were reported most frequently.

Table 7: Frequencies of Injuries / Symptoms, by Type of Event[^] - Louisiana Toxic Substance Incidents Program, 2010 - 2013

Injury / Symptom	Fixed Facility		Transportation		All Events	
	No. injuries	%*	No. injuries	%*	Total no.	%*
Burns (Chemical)	40	12.3	21	23.1	61	14.7
Burns (Thermal)	35	10.8	1	1.1	36	8.7
Burns (Both Chemical and Thermal)	4	1.2	0	0.0	4	1.0
Burns (Unknown)	4	1.2	0	0.0	4	1.0
Dizziness/Central Nervous System Symptoms	6	1.9	3	3.3	9	2.2
Eye Irritation	35	10.8	3	3.3	38	9.2
Gastrointestinal System Problems	13	4.0	2	2.2	15	3.6
Headache	14	4.3	1	1.1	15	3.6
Heart Problems	1	0.3	0	0.0	1	0.2
Heat Stress	No Injuries of this Type Reported					
Other	8	2.5	7	7.7	15	3.6
Respiratory System Problems	89	27.5	13	14.3	102	24.6
Shortness of Breath	13	4.0	0	0.0	13	3.1
Skin Irritation	16	4.9	5	5.5	21	5.1
Trauma (Chemical-Related)	19	5.9	5	5.5	24	5.8
Trauma (Not Chemical-Related)	18	5.6	28	30.8	46	11.1
Trauma (Unknown)	1	0.3	2	2.2	3	0.7
Unknown	8	2.5	0	0	8	1.9
Total	324	100.0	91	100.0	415	100.0

[^]The number of injuries is greater than the number of victims (352) because a victim could have had more than one injury.

*Total percentage may not equal 100 due to rounding

Beginning in 2011, LaTSIP made the decision that if it was an employee or responder that was injured, we could safely assume that the victim was over 18. For this report, 2010 age data was adjusted to reflect this.

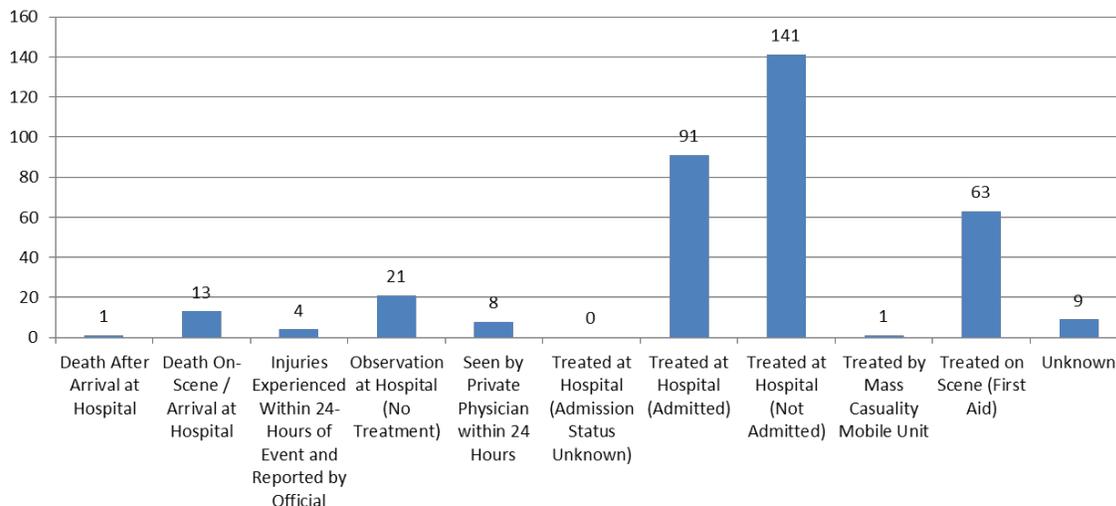
The age category was reported for 342 (96.7%) injured persons; 341 injured persons were reported as adults (18 years of age or older), with 1 being reported as a child under 18, and 10 were unknown. Sex was also known for 295 (83.8%) victims; of these, 256 (86.8%) were males.

Of the 352 victims, 141 (40.1%) were treated at a hospital but not admitted, and 91 (25.9%) were admitted to a hospital. There were also 14 deaths (Figure 6).

Two events resulted in 42 (13.0%) victims. In one event, an explosion killed 2 employees and sent a total of 114 people to local hospitals (most of these people did not have symptoms, and were therefore not included in the NTSIP database). Of the victims that reported symptoms, most experienced thermal burns. A second event resulted in 17 victims. In this event, an explosion occurred at a chemical facility. Most of the victims reported symptoms of shortness of

breath or other respiratory system issues. It is unknown what chemicals were released because the information had not been released at the time of NTSIP data finalization.

Figure 6: Injury Disposition - Louisiana Toxic Substance Incidents Program, 2010 - 2013

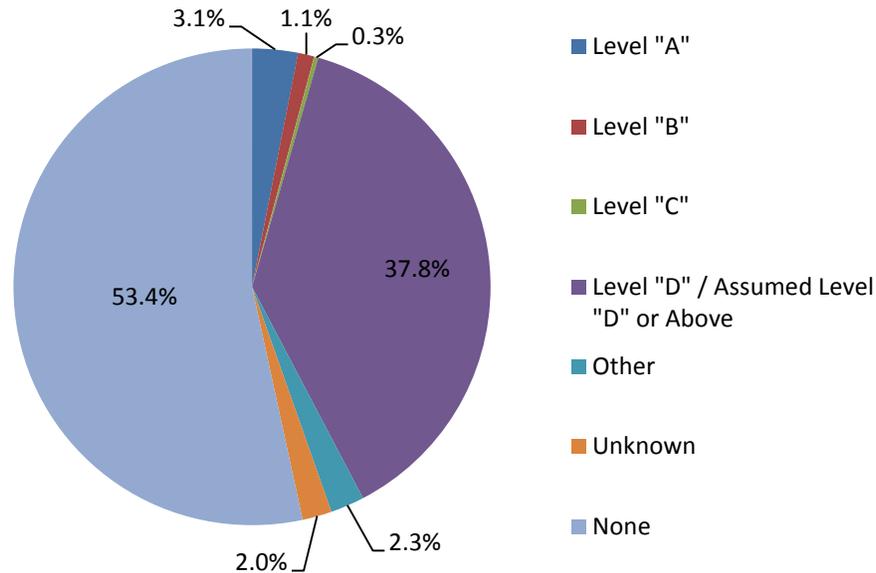


Personal protective equipment (PPE) use was reported for all employee-victims and responder-victims. Level “A” is the most protective form of PPE and used when the greatest level of skin, respiratory, and eye protection is necessary. Level “D” provides limited protection against chemical hazards but includes protection as coveralls, boots/shoes (chemical-resistant leather, steel toe and shank), safety glasses or chemical splash goggles, and hard hat.

After discussions with industry groups, it was decided that although PPE may not have been reported for employees at the large chemical plants, they were most likely wearing coveralls at a minimum, which would qualify as Level “D” PPE or above. To represent this, all NTSIP data was reanalyzed and adjustments were made to the data to reflect this. For employee victims of fixed-facility events assigned to a NAICS code beginning with 32, if their PPE status was unknown, it was changed to “Assumed Level D or Above.”

Using the recalculated results, most victims were still not wearing PPE (53.4%); however, this number was much lower than in previous individual year calculations by approximately 20% per year. It is assumed that 29% were wearing Level “D” or above, while another 8.8 were confirmed to be wearing Level “D”. Another 2.3% were categorized as wearing other types of PPE such as boots or eyewear (Figure 7).

Figure 7: PPE Status of Employee and Responder Victims - Louisiana Toxic Substance Incidents Program, 2010 – 2013



Nearby Populations

The proximity of the event location in relation to selected populations was determined using geographic information systems (GIS). Residences were within ¼ mile of 2043 (75.2%) NTSIP events (Table 8).

Table 8: Facilities within ¼ Mile of NTSIP Events - Louisiana Toxic Substance Incidents Program, 2010 - 2013

Facility Type	Number Within 1/4 Mile of NTSIP Event	% of Total NTSIP Events
Hospital	12	0.4
Licensed Day Care	184	6.8
Nursing Home	50	1.8
Other Business	1718	63.3
Residence	2043	75.2
School	130	4.8

The number of events at which persons were at risk of exposure was determined primarily using GIS. There were 2053 (75.6%) events with persons living within ¼ mile of the event; 2372 (87.4%) events with persons living within ½ mile; and 2651 (97.6%) events with persons living within 1 mile. There were 16 events where the GIS could not calculate the number of persons at risk.

Evacuations / Restrictions / Shelter in Place

Evacuations were ordered in 193 (7.1%) events. Of these evacuations, 67.3% were of buildings or affected parts of buildings, while the remainder used either a circle/ radius, evacuated the downstream / downwind area, or had no defined criteria. The estimated number of people evacuated ranged from under 5 to over 1000 people per event. Evacuations lasted from approximately 5 minutes to nearly 2 days. Restricted access was reported for 389 (14.3%) events. Restricted access ranged from parking lots to portion of buildings, to entire facilities. Officials ordered in-place sheltering for 106 (3.9%) of events.

Decontamination

A total of 251 people were decontaminated in 160 events. Of the 251 people who were decontaminated, 162 (64.5%) were decontaminated at a medical facility, 78 (31.1%) were decontaminated at the scene, and 11 (4.4%) people was decontaminated both on scene and at the hospital.

Response

Of the 2715 events, 20.1% reported 2 or more categories of personnel who responded, 8.0% reported 3 or more categories, and 3.0% reported 4 or more categories. Company response teams (59.6%) responded most frequently to events, followed by law enforcement agencies (15.5%), third party cleanup-up contractors (7.6%), and fire departments (7.1%) (Table 9).

Table 9: Distribution of Personnel Who Responded to the Event - Louisiana Toxic Substance Incidents Program, 2010 - 2013

Responder Category	No.	%*
3rd Party Clean-Up Contractor	274	7.6
Certified HazMat Team	208	5.8
Company's Response Team	2139	59.6
Department of Works / Utilities / Transportation (Includes Coast Guard)	5	0.1
EMT	40	1.1
Environmental Agency / EPA Response Team	57	1.6
Fire Department	255	7.1
Health Department / Health Agency	11	0.3
Hospital	5	0.1
Law Enforcement Agency	556	15.5
Local OEP	5	0.1
No Response	10	0.3
Other	14	0.4
Specialized Multiagency Team	2	0.1
State, County, or Local Emergency Managers	8	0.2
Total^	3589	99.9

*Total percentage may not equal 100 due to rounding

^The number of responders is greater than the number of events (2715) because an event could have had more than one category of responder

SUMMARY OF RESULTS

The numbers of toxic substance events, number of substances released, events with victims, and deaths for the individual years between 2010 and 2013 in Louisiana are shown in Table 10.

There were a total of 1882 fixed facility events and 833 events were associated with transportation. There were 3306 substances released, and the most frequent releases involved Methamphetamine Chemicals NOS (225 releases or 6.8%), Hydrochloric Acid (174 releases or 5.3%) and Benzene (129 releases or 3.9%).

There were a total of 352 victims resulting from 200 events; these victims included 14 (4.0%) fatalities. Respiratory system problems were the most frequently reported injury and accounted for 24.6% of injuries. Employees were the most commonly reported victim type. Of the 278 employee and responder victims, 156 (56.1%) had not worn any form of PPE.

Table 10: Cumulative Data for 2010 Through 2013 - Louisiana Toxic Substance Incidents Program, 2010 - 2013

Year	Type of Event			No. Substances Released	No. Victims	No. Deaths	Events with Victims	
	Fixed Facility	Transportation	Total				No.	% [†]
2010	531	209	740	937	91	1	62	8.4
2011	528	267	795	971	71	5	47	5.9
2012	457	222	679	798	77	5	50	7.4
2013	366	135	501	600	113	3	41	8.2
Total	1882	833	2715	3306	352	14	200	7.4

[†] Percentage of events with victims.

REFERENCES

1. Binder S. Death, injuries, and evacuations from acute hazardous materials releases. *Am J Public Health* 1989;70:1042-4.

APPENDIX

The 10 Substances Most Frequently Involved in Events - Louisiana Toxic Substance Incidents Program, 2010 - 2013

	Chemical Substance	Number of Releases
1	Methamphetamine Chemicals NOS	225
2	Hydrochloric Acid	174
3	Benzene	129
4	Ethylene	125
5	Sulfuric Acid	116
6	Sodium Hydroxide	115
7	Sulfur Dioxide	112
8	Ammonia	96
9	Natural Gas	87
10	Chlorine	82

GLOSSARY

Ancillary Process Equipment – Equipment used in the processing of chemicals, but excluding the process vessel.

Cooperative Agreement - An award similar to a grant, but in which the sponsor's staff may be actively involved in proposal preparation as well as research activities once the award has been made.

Fixed Facility Events - Events involving toxic materials that occur in a non-moving facility such as an oil refinery or manufacturing plant.

In-Place Sheltering - Protecting yourself where you are (home, workplace) and remaining there until given further instructions. This includes closing all windows, doors and vents as well as turning off all cooling, heating or ventilating systems.

Petroleum Only - Events in which only a petroleum product (i.e. gasoline, diesel fuel, etc.) is released.

Process Vessel - Chemical reaction chamber where chemicals are processed such as a tank, reactor or distillation column.

Responders - Individuals such as police officers, sheriff deputies, firefighters, and paramedics that respond to the scene of an emergency situation.

Toxic Substance Releases - Discharge of any toxic substance such as, chemical, biological, radiological, or medical material that may reasonable be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutations or malformations.

Transportation Events – Events involving toxic materials transported by ground transportation, railroad, aircraft, boats, ships and pipelines outside the boundaries of a fixed facility property.