# ACUTE HAZARDOUS EVENTS

# DATA BASE

INDUSTRIAL ECONOMICS, INCORPORATED

2067 MASSACHUSETTS AVENUE CAMBRIDGE, MASSACHUSETTS 02140

INTERIM FINAL

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# ACUTE HAZARDOUS EVENTS

# DATA BASE

Prepared for

The Office of Toxic Substances
Economics and Technology Division
U.S. Environmental Protection Agency
under
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Prepared by

Industrial Economics, Inc.
Cambridge, MA

Management Technology and Data Systems, Inc.
Boston, MA

PEI Associates, Inc.
Cincinnati, OH

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## FOREWORD

EPA published criteria for selecting substances on a listing of acutely hazardous substances, as well as a list resulting from the application of those criteria, in December 1985. Guidance documents for making use of the criteria and list were made available at the same time. Those materials were published as interim final documents, with opportunity for public review and comment.

The data base that is the subject of this report was developed as a part of the process of establishing the list-making criteria, and information from the data base was used in drafting the published criteria. EPA plans to add other records to the historical profile presented in this interim final report, in order to aid in the validation of the list-making criteria. Current plans are to supplement the current 3,121 records with records from two additional years of data from the National Response Center and from one or more State sources.

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ACUTE HAZARDOUS EVENTS DATABASE

Table of Contents

ACKNOWLEDGEMENTS.....i

EXECUTIVE SUMMARY..... ii

PROJECT BACKGROUND AND DATA BASE CHARACTERISTICS.....1
- Project Background.....1
- Methodology.....2
- AHE Database Characteristics.....4

DEATH OR INJURY EVENTS.....9
- Extent of Damage.....11
- Chemicals Participation.....12
- Quantities Involved.....13
- Mechanisms Behind Human Casualties.....13
- Circumstances of Release.....15
  - In-Plant Location.....15
  - In-Transit Location.....16
- Industries Involved.....16

NATURE OF ALL EVENTS.....19
- Extent of Damage.....19
- Chemicals Participation.....20
- Quantities Involved.....22
- Media Affected.....22

CIRCUMSTANCES OF RELEASE.....23
- In-Plant Location.....23
- In-Transit Location.....25

LARGE SCALE ATMOSPHERIC RELEASES OF ACUTELY TOXIC CHEMICALS.....27

ACUTE HAZARDOUS EVENTS DATABASE

Table of Contents
(Continued)

APPENDICES

A. Data Coding and Format Sheets
B. Data Base Profiles
C. Chemicals in the AHE Data Base
D. Data Base Summary for All Events
E. Data Base Summary for Death or Injury Events
F. Data Base Summary for Records Reporting Spill or Vapor Release as Worst End Effect
G. List of Events in Which Injury Occurred
H. List of Events in Which Deaths Occurred

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This study was conducted under EPA Contract Number 68-02-4055 by Industrial Economics, Inc.; Management Technology and Data Systems, Inc.; and PEI Associates, Inc. The principal members of the project team were: Dr. James Cummings-Saxton, Ms. Laura Lechner, and Ms. Anne E. Crook (Industrial Economics, Inc.); Dr. Samuel J. Ratick, Mr. Patrick Buckley, and Mr. Stephen Wu (Management Technology and Data Systems, Inc.); and Mr. Thomas K. Corwin, Mr. Edwin A. Pfetzing, Mr. E. Radha Krishnan, and Ms. Barbara A. Bruce (PEI Associates, Inc.).

The project team received valuable and generous assistance from individuals in several organizations in acquiring and making use of the data that went into the study. Among these are the EPA Office of Solid Waste and Emergency Response and the Transportation Systems Center of the U.S. Department of Transportation for access to the National Response Center data; EPA's Region 7, for making available its computerized data base; the California Highway Patrol and Office of Emergency Services; the New Jersey Department of Environmental Quality; the Ohio Environmental Protection Agency; and the Texas Air Control Board.

Several EPA employees had active roles in the project. Mr. Frederick W. Talcott was responsible for assembling and coding records from the news media; he was assisted by staff members of the EPA Headquarters Library and the Office of Standards and Regulations. Both Mr. Talcott and Ms. Karen East conducted analytic studies using the data base that have substantially contributed to this report. Mr. James Cottrell of the EPA Office of Toxic Substances, Information Management Division, provided valuable assistance in assigning CAS codes to several hundred listed substances.

We would like to thank the EPA project officers, Mr. Frederick W. Talcott and Mr. Neil Patel, for their active guidance and participation. Overall design and direction was provided by the Analysis Subgroup, led by Mr. Talcott, and including Ms. East, Mr. Patel, and Mr. David Wagner. These individuals and other members of the Acute Hazards List Workgroup provided reviews, comments, and other valuable assistance throughout the study effort.

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Copies of this Executive Summary and of the full report, Acute Hazardous Events Data Base (report number EPA 560-5-85-029) are available to the public from the National Technical Information Service, Springfield, Virginia 22161

## EXECUTIVE SUMMARY

The Acute Hazardous Events Data Base was assembled as part of EPA's review of the dangers posed to the U.S. public and industrial workers by sudden, accidental releases of toxic chemicals. Concern regarding such releases was heightened by the tragic incident that occurred on December 3, 1984 in Bhopal, India. EPA formed an Acute Hazards List Workgroup to investigate the safety-related characteristics of U.S. industry with regard to accidental chemical releases that could pose exceptional risks to human health, and to identify those chemicals that appear to represent unusually high risks. In late May, the decision was made to assemble an Acute Hazardous Events Data Base as part of the Acute Hazards Analysis review process.

### PURPOSE AND APPROACH

The main purpose of the AHE Data Base is to characterize the kinds of events releasing acutely toxic substances in the U.S., the substances involved, and the causative factors leading to their release. The AHE Data Base provides a historical perspective for those in the Acute Hazards List Workgroup who are assessing selection criteria for a priority list of acutely hazardous substances. The AHE Data Base was not constructed to serve as a basis for nation-wide estimates of frequencies of events, quantities released, or their consequences. Emphasis was placed on acquiring a measure of the scope of events rather than on estimating quantities precisely or frequencies of releases.

An important factor in the AHE Data Base development was the need for it to be assembled quickly in order to support other aspects of the analysis process. Because of the rigorous time constraints, several criteria were employed to screen data for

inclusion in the AHE Data Base. Emphasis was placed on incidents that had acute hazard potential. Incidents that involved death or injury were given highest priority. EPA further directed that priority be given to incidents involving chemicals released into air. Chemical releases were given priority over petroleum-related and other types of releases. Releases involving large quantities of material were given priority, and quantities involving less than one pound were not coded. Incidents involving evacuations also were given priority.

Through these data collection criteria, the AHE data base has been purposely biased toward events considered to have the greatest potential for sudden, large-scale harm to the populace. Thus, the summary statistics obtained from the data base are not reflective of the totality of potentially hazardous domestic materials released.

## DATA SOURCES

The data base contains 3,121 records which, through sampling, represent 6,928 separate events. One nation-wide government source, the National Response Center, contributed 1,225 records. A multi-state regional source, EPA's Region 7, provided 513 records. Five offices within four state governments were the source of 1,029 records. Four daily newspapers and one wire service contributed 290 records. Finally, 64 records were obtained from a summary prepared by an engineering consulting firm specializing in industrial accidents.

## EVENTS WITH INJURIES OR DEATHS

Human casualties occurred in fewer than seven percent of the recorded events. These events -- a total of 468 -- led to 138 deaths and 4,717 injuries, ranging in severity from temporary respiratory problems treated on-site to critical injuries and extended hospitalizations. Information on causation was scanty in many records.

Four high-volume industrial inorganic chemicals (chlorine, ammonia, hydrochloric acid and sulfuric acid) together were reported to have been released in over 25 percent of the events recording human casualties. Over 200 additional identifiable substances were recorded as released during events associated with deaths or injuries.

Neither great quantity nor high inherent toxicity alone produce the conditions for human casualties. When the characteristics of the released substances are examined, toxicity appears to be the cause of most of the injuries recorded, while flammability and explosivity are the mechanisms associated with most of the fatalities in the data base.

Transportation releases account for 25 percent of all events in the data base, and a somewhat higher percent of death or injury events (33 percent). Trucks are the predominant mode of transport in the death and injury events. Among events with human casualties at fixed facilities, storage vessels play a much larger role as release points than they do among events not leading to deaths or injuries.

When viewed from an industry perspective, the Chemicals and Allied Products and the Petroleum Refining industries together account for 34 percent of the reported injuries, and more than half of the reported deaths. The transportation industries account for 36 percent of reported injuries and about one-fourth of the reported deaths. Industries that use chemical or fuel products account for about 25 percent of the deaths and injuries.

## OTHER EFFECTS

Information on evacuations, property damage and environmental damage was seldom provided in the records examined. In records furnishing such information, evacuations totalled more than 200,000 individuals, with one event accounting for 20,000 people. Information on environmental and property damage was usually expressed in vague terms. One source reported over 60 large-scale industrial accidents having an average estimated economic cost of $30 million, with one event incurring more than $100 million in estimated damages.

## SUBSTANCES AND QUANTITIES RELEASED

For events reporting quantity released, the quantities approximate a log normal distribution. Amount released exceeds 1,000 pounds for over 38 percent of the recorded events. Releases over 100,000 pounds occur in less than three percent of the events, but these events account for 93 percent of the total quantity of materials released. Over 80 percent of the events in

the data base reported that at least one of the substances released was a liquid; 16 percent of the events involved the release of a gas.

## CAUSATIVE FACTORS

Among events occurring at fixed facilities, spills are the predominant end effect, followed by vapor releases, fires, and explosions. Storage vessels, process vessels, and valves or piping are responsible for nearly equal shares of in-plant events, but storage vessels typically release much larger quantities. Equipment failure is the cause most frequently reported for in-plant events, followed by operator error. Causation is difficult to assess for many of the events in the data base, however.

Over half of the in-transit events involve trucks, another 36 percent involve rail cars. Over 38 percent of the in-transit releases stem from a leak, and another 20 percent from collisions. Although few events were reported for pipelines, those spills dwarf other in-transit releases in terms of total quantity released.

## PROJECT BACKGROUND AND DATA BASE CHARACTERISTICS

### PROJECT BACKGROUND

The Acute Hazardous Events (AHE) Data Base was assembled as part of EPA's review of the dangers posed to the U.S. public and industrial workers by sudden, accidental releases of toxic chemicals. Concern regarding such releases was heightened by the tragic incident that occurred on December 3, 1984 in Bhopal, India. EPA formed an Acute Hazards List Workgroup to investigate the safety-related characteristics of the U.S. industry with regard to accidental chemical releases that could pose exceptional risks to human health, and to identify those chemicals that appear to represent unusually high risks. In late May, the decision was made to assemble an Acute Hazardous Events Data Base as part of the Acute Hazards Analysis review process.

An important factor in AHE Data Base development was the need for it to be quickly assembled in order to support other aspects of the analysis process. A team of three contractors was assembled, with Industrial Economics, Inc. responsible for overall direction. Other contractors included: Management Technology and Data Systems, Inc. (MTDS) and PEI Associates, Inc. The project was initiated in late May, 1985. An initial AHE Data Base containing 900 records was delivered to EPA at the end of seven weeks. The AHE Data Base was expanded to 2,100 records at the end of nine weeks, and reached its present 3,121 record size in mid-August. Through data sampling, the records in the AHE Data Base represent 6,928 actual incidents.

Because of the rigorous time constraints, several criteria were employed to screen data for inclusion in the AHE Data Base. Emphasis was placed on incidents that had acute hazard potential. Incidents that involved death or injury were given highest priority. EPA further directed that priority be given to incidents involving chemicals released into air. Chemical releases were given priority over petroleum-related and other types of releases. Releases involving large quantities of material were given priority, and quantities involving less than one pound were not coded. Incidents involving evacuations were also given priority.

Through these data collection criteria, the AHE Data Base has been purposely biased toward events considered to have the greatest potential for sudden, large-scale harm to the populace. Thus, the summary statistics obtained from the data base are not reflective of the totality of potentially hazardous domestic materials released.

## METHODOLOGY

The main purpose of the AHE data base is to characterize the kinds of events releasing acutely toxic substances in the U.S., the substances involved, and the causative factors leading to their release. The AHE data base provides a historical perspective for those in the Acute Hazards List Workgroup who are assessing selection criteria for a priority list of acutely hazardous substances. The AHE data base was not constructed to serve as a basis for nation-wide estimates of frequencies of events, quantities released or their consequences. Emphasis was placed on acquiring a measure of the scope of events rather than on estimating quantities precisely or frequencies of releases.

Data sources were selected that yielded a large number of usable records portraying a variety of release circumstances and outcomes. The sources differed in the extent and quality of various information types. For instance, some of the state sources indicated in-plant location and attributed cause more fully than other data sources, while the news media sources more frequently provided information on the human consequences of an event. Geographical distribution was sought, with emphasis given to regions having greater petrochemical production activity. Four state data sources and four daily newspapers were accessed to provide more detailed information in those regions than the information found in the nation-wide sources.

Records were sought for the five-year period from 1980 to early 1985. Most sources were available for only a portion of that period. Time and resource constraints limited the coding of records to about three years per source, with most of the records coming from 1983 and 1984.

The National Response Center (NRC) had the most readily available records. All NRC records involving air releases or deaths or injuries were coded, and a one-tenth sample was obtained from the remaining records. For other contributing sources, records were selected using the screening criteria described above. Project emphases and priorities previously discussed influenced the amount of time and attention the coders gave to individual records.

A two-page data collection form (Appendix A) and instructions for data coders were developed and pre-tested. Coders were junior level to senior level professionals with background training or experience in engineering, chemistry, risk assessment and other disciplines. For each contributing source, the time period and other constraints on the records of interest were specified and copies of the records were acquired, usually in hard-copy form. NRC data processing entailed the most systematic effort. The DOT Transportation Systems Center provided a specially prepared computer tape from which sample records were obtained and arranged for semi-automated coding. Other sources involved computer print-outs, and some were accessed as written records. United Press International was searched on-line through a commercial time-sharing service. The other news media were searched via printed annual indexes and back issues on microfilm.

A data record structure was developed for the coded records. The EPA project officers specified that the data base be accessible using commercially available personal computer (PC) software; dBase III was selected for compatibility with most of EPA's installed PC capability. A set of standardized programs were developed to provide summaries and tabulations on the whole of the data or selected portions. Those programs produced the information presented in this report.

Error checking took place both when records were entered and after assembly into an integrated data base. Neither the study team nor EPA has made an independent verification of the information within any of the records. Error checking and editing was limited to seeing that the coded records accurately reflected the

reports as received. Thus, the study team did not discover events not previously recorded elsewhere nor did they exercise quality control by second-guessing the records' details.

When one-quarter of the eventual 3,121 records had been coded and entered, preliminary results were presented for review by EPA project officers and the larger Workgroup. This process was repeated when about two-thirds of the records had been coded, and the form of most of the displays presented in this report was established at that time. Several displays (and their accompanying text) were added as drafts were circulated for comment, including some prepared by the EPA members of the study team.

## AHE DATA BASE CHARACTERISTICS

- The AHE Data Base currently includes 3,121 records that represent 6,928 events.

- The data base contains information on substances and quantities released, event location, description of causative factors, and description of end effects. The latter include: deaths, injuries, and property and environmental damage. The data base also contains company names, date of event, and city and state in which the event occurred.

- The types of accidents not contained in the AHE Data Base include: citizen complaints of oily substances, foul odors, and the like; incidents that are not chemicals industry related; and incidents in which only non-hazardous materials are involved.

- Records included in the Data Base were gathered from 13 sources -- four national, four regional, and five state -- as shown in Exhibit 1 and summarized below.

- National Response Center: Hazardous substances released nationally to air, water, and land. Includes in-plant and transport releases. PCBs and four other chemicals account for 60 percent of the records. Through a stratified random sampling scheme applied to the NRC data, the 1,225 records represent a total of 5,032 NRC-recorded events.

- News Wire Service (UPI): Nationwide coverage of large events. Evacuations, injuries, and deaths commonly reported.

- Marsh and McLennan: U.S. incidents included among the 100 worst industrial accidents (rated by property damage). One-tenth transportation related; the remainder split evenly between chemicals processing and petroleum refining.

- EPA Region 7: Incidents affecting all media in Iowa, Kansas, Missouri and Nebraska.

- Newspapers: News reports, mainly of large events. Regional coverage with emphasis on state events.

- State Reporting Systems: Texas data cover air releases from manufacturing facilities. Ohio data include manufacturing and transportation releases. California data emphasize transportation and releases to land. New Jersey data focus on large releases and events with significant effects.

o Exhibits 2 and 3 show the sources of Data Base events by year.

- Marsh and McLennan (M&M): Listing of the 100 largest worldwide petrochemical accidents contributed about 50 U.S. events before 1980 and 3 or 4 per year thereafter.

- Four states (California, Texas, Ohio, and New Jersey) yielded fewer than 100 events in 1980 and 1981, then increased to 400 events in 1984.

- EPA's Region 7 contributed over 100 events for each of the years 1981 through 1984.

- The National Response Center (NRC) yielded over 500 events in 1983 and just under 700 in 1984.

- Various news media (four papers and one wire service) contributed about 50 events per year from 1980 through 1984.

o Exhibit 4 expands on the news media sources.

- Approximately 60 newsworthy events were obtained from printed annual indexes for the LA Times (LAT), New Orleans Times-Picayunne (NTP), Chicago Tribune (CHT), and New York Times (NYT) in 1980 and 1981.

- Full text of United Press International (UPI) stories were obtained from computer listings from April 1983 on. This source yielded about 50 events in 1983 and 1984 and 34 through early July 1985.

- A gap in coverage occurs for the 15 months from January 1982 through March 1983. This gap is due to the time constraints imposed on the data collection process, and the extensive time required to review records of the individual newspapers.

## REPORT ORGANIZATION

The remainder of this report is divided into four major sections and a set of appendices. The major sections are:

- Death or Injury Events,
- Nature of All Events,
- Circumstances of Release, and
- Large Scale Atmospheric Releases of Acutely Toxic Chemicals.

The section on death and injury events discusses average numbers of deaths or injuries, chemicals frequently involved, quantities released, mechanisms leading to deaths, circumstances of releases (such as location, cause, process state, transit mode, etc.), and industries involved.

The section on all events provides an overview of information included in the AHE Data Base. Frequently reported chemicals, quantities released, media affected, environmental and property damage, and evacuations are discussed.

The section on the circumstances of release discusses end effects, event location, cause, production configuration, contributory effects of high temperature and pressure, in-transit mode, and relationships between these factors and quantity released for all events.

The final section considers large-scale atmospheric releases of acutely toxic materials. These events are examined from the perspective of their similarity to the situation that occurred in Bhopal.

Eight appendices provide detailed background material regarding the information contained in the AHE Data Base. The Data Coding and Format Sheets (Appendix A) identify the information included in a complete record, although few records include all of this data. Data Base Profiles (Appendix B) identify the principal characteristics of the source data files providing the information assembled with the AHE Data Base. Appendix C provides a list of all chemicals included in the data base, including their common name; 4-digit SIC code of the

producing sector; their Chemical Abstracts Service (CAS) identification number; and the number of incidents, injuries, and fatalities with which they are associated. Appendices D and E provide summary outputs of AHE Data Base information for all events and for death or injury events. Appendix F provides a similar summary for those events reporting a spill or vapor release as the worst end-effect. Appendices G and H provide a full list of all events in which an injury or death occurred.

## DEATH OR INJURY EVENTS

Each of the original records coded into the data base was examined for indications of human casualties. In most cases, the record appeared unambiguously to indicate the presence or absence of deaths or injuries. However, about 12 percent of the records indicated injuries as unknown, and eight percent of the records listed deaths as unknown. (Exhibits 5 and 6.) Although some records in the data base may represent events that involved injuries or deaths, it was not possible to estimate the degree of under-reporting without follow-up on those events.

Some other cautions are necessary in interpreting the reported casualty data:

- Reported Deaths or Injuries: None of the events have been independently verified in this study to date, either by EPA or the team of contractors. Thus, one should view these data as "deaths or injuries reported to one or more of the contributing sources."

- Causation: Direct evidence of causation rarely exists in the contributing sources of these records. Some of the deaths or injuries reported to have occurred in association with a particular event may not, in fact, have been caused by the event. Another aspect is that some casualties may well have been caused by a triggering accident that released a substance into the environment (e.g., a truck driver whose injuries were caused by a collision, and not the succeeding exposure to released materials.) Whenever possible, deaths explicitly resulting from a collision were removed from the data base. However, it is not possible

to identify how many of the deaths and injuries remaining in the data base fall into this type of situation.

- Range of Severity: Although some records indicate in some detail the type and severity of the reported injuries, most records do not. To break out the severity of injuries for these records requires an investment in detailed follow-up that was not possible during this study. Thus, an individual "injury" could range from temporary respiratory or eye irritation treated on-site to critical injury leading to prolonged hospital treatment.

- Numbers: Some of the source records provide counts of injuries that suggested precision, whereas others (explicitly or implicitly) were approximate counts. If the source provided a number, it was recorded; but sometimes it was necessary to translate phrases such as "a few" or "about 50" etc. into specific numbers. Thus, the precision of the individual records composing the data base is highly variable.

Although there is understandable interest in making nation-wide estimates of deaths and injuries, the study was not designed with that purpose in mind. Rather, the objective was to better understand the kinds and causes of accidental releases. Before drawing conclusions regarding five-year national totals, the reader should carefully assess the cautionary notes above and consider the following factors:

- The five media sources (four daily papers and one wire-service) contributed nine percent of the total number of records, but those records accounted for 33 percent of the total injuries and almost 70 percent of the deaths. Although these sources together cover the period 1980 to 1985, no one source was completely searched for the entire period, and most were searched for three years or less. (Exhibit 4 and Appendix E)

- Although each of the four daily papers had a separate regional focus, they each also reported moderate to severe accidents from other parts of the country. Some events appeared in two or three of these sources, as well as occasional other sources. Thus, it is believed that most of the major events that received national media attention during the period have been included in the data base.

- On the other hand, some events involving human casualties showed up in only one of the sources searched. This suggests that one would find other events of similar magnitude both by searching additional years for the sources used in this study, and by examining other media sources with different regional specializations.

- Some types of events may not be reported to one of the contribuing sources due to the circumstances under which the events occurred, such as an event involving casualties that are limited to the work-place. The federal OSHA and state occupational safety and health records have not been examined to determine the extent of over-lap between those records and the ones in the data base. Thus, it is not possible at this point to estimate how many additional records might be identified by accessing those sources.

EXTENT OF DAMAGE

- Four hundred sixty-eight events (6.8 percent of all events) involve death or injury. Total deaths reported is 138 and total injuries 4,717.

- When injuries occur, the average number of injuries per incident is 10. Number of injuries per event ranges from 1 to 355. (Appendix E)

- When deaths occur, the average number of deaths per incident is 2. Number of deaths per event ranges from 1 to 11. (Appendix E)

- Injuries are reported for 98.1 percent of the events resulting in deaths or injuries. Deaths are reported for 13.7 percent of the events resulting in deaths or injuries. (Exhibit 5 and 6)

- Evacuations are reported almost seven times more frequently among incidents resulting in deaths or injuries. (Exhibit 7)

- For those events involving death or injury, property damage was reported in over 35 percent and environmental damage in approximately 10 percent of the events.

CHEMICALS PARTICIPATION

- The twenty most frequently reported substances account for 44 percent of the events resulting in deaths or injuries. (See Exhibit 8 for list of substances.)

  - Chlorine is involved in 9.6 percent of the events resulting in deaths or injuries. (Exhibit 9)

  - Anhydrous Ammonia, Hydrochloric Acid, and Sulfuric Acid are involved respectively in 6.8, 5.6, and 4.7 percent of the events resulting in deaths or injuries. (Exhibit 9)

  - The next six most reported chemicals are involved in 9.0 percent of the events resulting in deaths or injuries. (Exhibit 9)

  - The next ten most reported substances are involved in 8.3 percent of the events resulting in deaths or injuries.

- Polychlorinated Biphenyls (PCBs) play a much less significant role among the death or injury events than they do among the overall events (2.8 percent versus 28 percent).

QUANTITIES INVOLVED

- More than half of incidents resulting in deaths or injuries released less than 1,000 pounds. (Exhibit 10)

- Events involving releases greater than 100,000 pounds account for almost all of the quantity reported released in events resulting in deaths or injuries. (Exhibit 10)

- Few events resulting in deaths or injuries involve a substance with a reportable quantity (RQ) of one pound.1/ There is no discernible trend as to the number of events involving substances with RQs of 10, 100, 1,000, and 5,000 pounds. (Exhibit 11)

- Two hundred thirty-nine of the death or injury events involved chemicals that have been assigned an RQ. Sixty-four percent of the events involved releases exceeding the RQ. In approximately three percent of the events the quantity released exceeded 1,000 times the RQ. In 12 percent of the events the amount released was between 100 and 1,000 times the RQ. (Exhibit 12)

MECHANISMS BEHIND HUMAN CASUALTIES

Results of a preliminary analysis of the apparent cause of reported deaths or injuries are displayed in Exhibit 13. The analysis draws upon the records containing the 20 substances reportedly released in association with the greatest total number of deaths or injuries. These records account for two-thirds of the total reported injuries and three-quarters of the total reported deaths.

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*1/ A reportable quantity, as defined in 40 CFR 302 is "that quantity, as set forth in this part, the release of which requires notification pursuant to this part". A reportable quantity is assigned to substances designated as hazardous under sections 102(a) and 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 or under section 311(b)(2)(A) of the Clean Water Act.*

The reported end effects (fire, explosion, vapor release, or spill) were used as surrogates for cause of death and injury, since most records do not contain sufficiently explicit information to make a more precise determination. Vapor releases and spills were used as indicators of toxicity as the cause of the injury or fatality, because it was reasoned that these events are more likely to lead to a toxic exposure than a fire or explosion. Individual records were examined in order to consider all recorded information while classifying events, since multiple end effects are often reported in an individual record. The classification reflects a best judgement regarding the cause of the human effects.

- o Fires and explosions predominate as the cause of deaths, while toxic exposure via a spill or vapor release is nearly always associated with injuries. (Exhibit 13)

- o Representative substances among the events analyzed include the following:

  - Injury Events

    + Fire or Explosion as the cause: Ammonia, Chlorine, Hydrochloric Acid

    + Toxicity as the cause: Ammonia, Chlorine, Hydrochloric Acid, Phosgene, Nitric Acid

  - Death Events

    + Fire or Explosion as the cause: Chlorine, Gasoline, Oil, Propane

    + Toxicity as the cause: Chlorine, Hydrogen Sulfide, Sodium Nitrate

## CIRCUMSTANCES OF RELEASE

### In-Plant Location

- Storage vessels are reported as in-plant event location almost twice as often for events resulting in deaths or injuries as for other events. (Exhibit 14)

- Operator error is reported as the attributed cause slightly more frequently for events resulting in deaths or injuries than for other events. The cause of the accidental release is unknown almost twice as frequently for events resulting in deaths or injuries as for other records. (Exhibit 15)

- Loading or unloading operations are reported slightly more frequently and steady state is reported half as frequently for events resulting in deaths or injuries than for other events. (Exhibit 16)

- Equipment failures in death or injury incidents account for approximately one-quarter of release events at most plant locations, and two-thirds at valve and pipe sites. Upset conditions represent less than five percent of release events at all locations except process vessels, at which they account for 13 percent. (Exhibit 17)

- Loading and unloading release events resulting in death or injury are six times as likely to occur at storage vessel sites as at other plant locations. Steady state release events are most likely to occur at process vessels, valves and pipes, and in "other" plant locations. (Exhibit 18)

- Spills are reported as an end effect in 54.2 percent of the events resulting in death or injury, vapor release in 52.6 percent, fire in 26.9 percent, and explosion in 23.3 percent. In events resulting in deaths, spills were reported as an end effect in 28.1 percent, vapor release in 40.6 percent, fire in 65.6 percent, and explosion in 70.3 percent. (Exhibit 19)

- Fires are reported over five times more frequently as the end effect of a release in events in which deaths or injuries result than in other events. (Exhibit 19)

- Explosions are reported over six times more frequently as an end effect of a release when deaths or injuries result than in other events. (Exhibit 19)

In-Transit Location

- In-transit incidents play a larger role in death or injury events than they do in overall events -- 35 percent versus 25 percent. (Exhibit 20)

- Truck transport represents an increased share and rail transport a decreased share for events resulting in deaths or injuries than for other in-transit events. (Exhibit 21)

- Collision is reported as in-transit cause over twice as frequently for incidents resulting in deaths or injuries than for other incidents. (Exhibit 22)

INDUSTRIES INVOLVED

- Industry sectors were identified for the responsible parties in the 468 events reporting deaths and/or injuries. Sources for this included the Dun & Bradstreet Reference Book, SRI Directory of Chemical Producers, and identifying information in each of the individual records. It was possible to assign a 4-digit Standard Industrial Classification (SIC) codes to 95 percent of the records. The reported responsible parties ranged over all sectors of the economy, with a heavy concentration in manufacturing, transportation, and wholesale and retail trade.

- When the 4,717 reported injuries are distributed among responsible parties, Petroleum Refining and Chemicals and Allied Products are associated with five percent and 29 percent of the total, respectively. The Transportation industry (mostly In-Transit, but including other Transportation Services) are associated with 36 percent of the reported injuries. "Down-stream" users of chemical products as a whole are responsible for 26 percent of the total, with Manufacturing (other than Petroleum and Chemicals) accounting for half of that amount. (Exhibit 23)

- The contribution of the Petroleum Refining and Chemicals and Allied Products sectors is more extensive in the incidents leading to the 138 reported deaths. These two sectors are involved in incidents associated with more than half the deaths. Their respective contributions are 13 and 38 percent. The Transportation industry accounts for a smaller fraction of deaths than for injuries, but remains responsible for almost one-fourth of the total. The role of "down-stream" users of chemicals also is just under one-fourth. (Exhibit 24)

- About one-third of the events with reported deaths or injuries also reported evacuations. The industry distribution of these events shows a similar pattern to the distribution of injuries, although the industry sectors "down-stream" from Petroleum and Chemicals account for a larger fraction than those two sectors combined (35 percent). Wholesale and Retail Trade and Other Services account for about the same fraction of the total as Manufacturing, other than Petroleum and Chemicals. (Exhibit 25)

- There appear to be differences among the industries in terms of the kinds of end effects reported. For most industries, events with human casualties tend to report vapor releases or spills about twice as often as fires or explosions. That is, "toxic" end effects outweigh "flammability" end effects two to one. For Agriculture, the ratio of "toxic" to "flammability" is more extreme

-- about four to one. The ratio is reversed, however, for events involving the Petroleum Refining industry -- "flammability" end effects outweigh "toxic" end effects by about three to one. (Exhibit 26)

## NATURE OF ALL EVENTS

### EXTENT OF DAMAGE

- Injuries are reported in 6.6 percent of the 6,928 total events. (Exhibit 5)

- Deaths are reported in only 0.9 percent of the events. (Exhibit 6)

- Evacuation is reported in only 4.9 percent of the events; however, in over 78 percent of the events it was not stated whether evacuation was required. (Exhibit 7)

- At least 217 thousand people are reported evacuated for all events in which evacuation is reported. This total excludes non-specific descriptions of number of people evacuated, such as "several people" or "all employees."

- When evacuation is reported, an average of 638 people per event are evacuated. Number of people evacuated ranges from 10 people to 20,000 people.

- Less than seven percent of the events involve property damage, while 27 percent explicitly do not. Similarly, less than three percent involve environmental damage, while 10 percent explicitly do not. However, in each case, there is a large number of events in which it was not stated whether property (66 percent) or environmental (87 percent) damaged occurred. Estimates of property damage are usually expressed in very general terms; they range up to $100 million for one event.

- One of the contributing sources (Marsh & McLennan) presented data on 64 domestic industrial accidents from 1956 to 1984 resulting in large amounts of property damage. Ten percent of the accidents were transport-related. The remaining 90 percent split evenly between the Petroleum Refining industry and the Chemicals and Allied Products industries. Estimated costs (in 1984 dollars) averaged about $30 million for each of these incidents. The worst accidents (in terms of economic costs) were four accidents in the Petroleum Refining industry with estimated costs between $70 million and $100 million each. (Exhibit 27)

CHEMICALS PARTICIPATION

- The 20 most frequently reported substances account for 57.8 percent of the data base events. (See Exhibit 8 for list of substances.)

  - PCBs are reported in 23.0 percent of the incidents. (Exhibit 28)

  - The next nine most frequently reported substances appear in 25.6 percent of the incidents. (Exhibit 28)

  - The next ten most frequently reported substances appear in 9.3 percent of the incidents.

- Half of the top 20 substances have a reportable quantity (RQ) of 1,000 pounds of more. (Exhibit 8)

- A total of 770 different substance names were recorded among the 3,121 coded records. Although some of the names were quite vague or contained apparent misspellings, it was possible to assign four-digit SIC codes to 93 percent of the substances. (Appendix C)

- Based on their 4-digit SIC codes, the substances were assigned to one of 11 major SIC groups. Forty percent of the named substances are Industrial Organics and 20 percent are Industrial Inorganics, with the remainder split among Pesticides, Plastics, Petroleum Products and other categories. (Exhibit 29)

- For total number of events in which substances are reported to have been released, Industrial Organics and Industrial Inorganics maintain about the same proportions as the count of substance names (35 percent and 21 percent). Fertilizers (12 percent), Chlorine and Alkalies (9 percent) and Plastics (8 percent) also account for significant shares. (Exhibit 30)

- Petroleum Products dominate the total quantities released (over 81 percent of total volume), Industrial Organics are second (13 percent), and Fertilizers third (2.4 percent). (Exhibit 31)

- The distribution of events with injuries is similar to that for all events. Industrial Organics and Industrial Inorganics account for about half of the events. Petroleum Products play a significantly more significant role, at 6.4 percent. The distribution is similar when number of injuries is considered. (Exhibits 32 and 33)

- Comparing the distribution of events with fatalities with that of all events, Industrial Organics maintain the same predominant position (about 40 percent), but Industrial Inorganics account for only about 10 percent. Petroleum Products, on the other hand, account for almost 15 percent of the events with fatalities, or roughly five times the rate of occurence of these products in the data base as a whole. Not surprisingly, Explosives account for a much greater share of fatalities than their contribution to events as a whole. The shares for Chlorine and Alkalies, Pesticides, and Fertilizers decline in events with fatalities. (Exhibit 34).

QUANTITIES INVOLVED

- Quantity released is identified in 75.2 percent of the events. In 38.1 percent of the events for which the quantity released is identified, the release size exceeds 1,000 pounds. (Exhibit 35)

- Releases of over 100,000 pounds occur in less than 2.5 percent of the events, but account for 93.2 percent of the total quantity of material reported released in the data base. The largest release reported was 266 million pounds, and 2,569 releases between 10 and 1,000 pounds were reported. (Exhibit 35)

- All but one (Sodium Hydroxide) of the ten most frequently reported substances are on average released in quantities lower than the average quantity released for all substances. (Exhibit 36)

MEDIA AFFECTED

- In 81.8 percent of the events, at least one of the substances released is a liquid; in 15.5 percent of the events, at least one of the substances released is a gas; and in 3.3 percent of the events at least one of the substances released is a solid. If PCBs are excluded, the distribution is 75.5 percent liquid, 20.9 percent gas, and 4.5 percent solid. (Exhibit 37)

- Air is affected in approximately 30 percent of the events and not affected in 5 percent; water is affected in 15 percent and not affected in 41 percent; and land is affected in 53 percent and not in 13 percent. There is a large percentage of events in which it is not specified whether a particular media was affected: 65 percent for air, 44 percent for water, and 34 percent for land.

## CIRCUMSTANCES OF RELEASE

- Three quarters of the events occur at a plant location; the remainder occur during transit. If PCBs are excluded, 66 percent are in-plant and 34 percent are in-transit.

## IN PLANT LOCATION

- Spill is reported as an end-effect in 71.7 percent of the events; vapor release in 25.8 percent; fire in 5.0 percent; and explosion in 3.6 percent. Excluding the PCB events, the proportions are: spills, 67.8 percent; vapor releases, 33.1 percent; fire, 5.9 percent; and explosion, 4.1 percent. Note that multiple end-effects may be reported; therefore, percents will not total to 100 percent. (Exhibit 38)

- The estimated severity of end effects was estimated to be (in order of decreasing severity) explosion, fire, vapor release, spill, other, and unknown. A majority of the events (61.8 percent) report spill as the worst end effect occurring. Another 23.7 percent of the events report vapor release as the most severe end effect occurring. Only 3.7 and 2.8 percent of the events, respectively, report explosion or fire as the worst end effect occurring.

- Storage vessels, process vessels, and valves or piping account for approximately equal shares of in-plant events. (Exhibit 14)

- Storage vessels account for 86.6 percent of the quantity released. However, when deaths or injury are involved, "other" locations (transformers, capacitors, scrubbers, other air pollution control equipment, etc.) account for 87.5 percent of the quantity released. (Exhibit 39)

- Equipment failure is identified as the cause of 43.3 percent of the number of the events occurring in-plant (Exhibit 15). However, "other" causes (corrosion, power failure, vandalism, pollution control equipment down for maintenance, etc.) account for 80.8 percent of the quantity released. (Exhibit 40)

- In-plant events primarily occur under steady state conditions (30.6 percent) or during loading or unloading operations (15.1 percent). Operational configuration is not reported for about half the incidents. (Exhibit 16)

- In-plant locations have similar patterns of event causes, with three notable exceptions: valve and pipe locations are more frequent for equipment failures, storage locations are more frequent for operator causes, and process vessel locations are more frequent for process upset causes. (Exhibit 41)

- Steady state incidents occur most frequently for all in-plant locations, except storage. Loading and unloading incidents are the most frequent contributors to storage mishaps. (Exhibit 42)

- The majority of the incidents involving process vessels, "other" locations, or unknown locations release less than 1,000 pounds of material; while the majority of incidents involving storage vessels or valves and pipes release more than 1,000 pounds of material. (Exhibits 43, 44, 45, 46, and 47)

- Ten percent of the in-plant events account for over 97 percent of the amount released. Those events greater than 100,000 pounds in release size (2.5 percent of in-plant events) account for 93 percent of the quantity released.

- Events involving releases over 100,000 pounds account for the majority of material released for all locations except valves and pipes and unknown location. (Exhibits 43, 44, 45, 46, and 47)

- The majority of events attributed to all causes except operator error release less than 1,000 pounds. The majority of events attributed to operator error release over 1,000 pounds. (Exhibits 48, 49, 50, 51, 52, and 53)

- Events involving releases over 100,000 pounds account for the majority of material released for all causes except fire. Events involving releases of 50,000 to 100,000 pounds account for most of the material released when fire is the cause. (Exhibits 48, 49, 50, 51, 52, and 53)

- In 2.2 percent of the events, high temperature is reported as a contributing factor. However, in 81.7 percent of the events it is not stated whether high temperature was a contributing factor.

- In 3.5 percent of the events, high pressure is reported as a contributing factor. In 80.8 percent of the events, it is not stated whether high pressure was a contributing factor.

IN-TRANSIT LOCATION

- In-transit events account for 25.2 percent of the events. (Exhibit 20)

- Most in-transit events (54.5 percent) involve trucks; another 36.1 percent involve rail cars. (Exhibit 21)

- Of the releases of hazardous materials during transportation, 38.4 percent are the result of a leak, and 20.3 percent are the result of a collision. (Exhibit 22)

- Over half of the events for each transit mode, except pipelines, release less than 1,000 pounds. The majority of events occurring in pipelines release over 1,000 pounds. (Exhibits 54, 55, 56, 57 and 58)

- The quantity reported released in events occurring in pipelines accounts for 58.8 percent of the total quantity released in in-transit events. However, the bulk of this was contributed by three large pipeline spills; otherwise, pipelines are responsible for only a small fraction of release events and quantities. The quantities reported released in truck and rail events respectively account for 17.4 and 16.1 percent of the total quantity reported released in in-transit events. (Exhibit 59)

- Events involving releases over 100,000 pounds account for almost all of the quantity reported released in pipeline and barge events. In rail events, incidents involving over 50,000 pounds account for nearly all the quantity reported released. (Exhibits 55, 56, and 57)

- Over one-quarter of the rail releases are in the 100 to 1,000 pound range, yet about the same number of events are in the 10,000 to 100,000 pound range, i.e., 100 times as large. (Exhibit 55)

- In events involving "other" transit modes (usually airplanes) no events are reported with quantities over 10,000 pounds. (Exhibit 58)

## LARGE SCALE ATMOSPHERIC RELEASES OF ACUTELY TOXIC CHEMICALS

The AHE Data Base was developed to support EPA review of public and worker safety relative to accidental release of acutely toxic chemicals. The assembled AHE Data Base was subsequently analyzed to assess the extent to which historical U.S. release events correspond to the situation that occured in Bhopal, India. It was found that no U.S. incident in the data base closely corresponds to the Bhopal incident, and that the general character of U.S. release events differs from that observed in Bhopal. Significant aspects of the incident in Bhopal, and attributes of AHE Data Base incidents are as follows:

- In Bhopal, an estimated 80,000 pounds of methyl isocyanate and reaction products was released from a storage vessel over an approximately two-hour period. Although the causes of the accident have not been clearly identified, several factors appear to have contributed. These include: operator error, equipment failure, and upset condition. The end effect of the incident was a vapor release resulting in the deaths of over 2,000 people.

- In comparison, 11 deaths is the maximum number attributable to a single incident in the AHE Data Base. None of the seven incidents in the AHE Data Base that lead to five or more deaths involve highly toxic materials. As shown in Exhibit 13, nearly all (92 percent) of the deaths are associated with fires and/or explosions rather than with toxic chemicals.

- Only 3 percent of the AHE Data Base events for which quantity is identified involve releases that exceed 80,000 pounds. These large-scale releases account for 5.7 percent of the death or injury events. None of the large release events involve a toxic chemical release that results in a fatality.

- Approximately 30 percent (25 events) of the large-scale events (those releasing at least 80,000 pounds of materials) involve acutely toxic substances. About half of these large-scale acutely toxic releases involve the formation of a vapor cloud. The other events release either unknown substances, less toxic materials, or fire and explosion hazards.

- One-fifth of the large-scale acutely toxic release led to one or more injuries. The total number of injuries for these events was reported to be 429, which includes one transportation event that reportedly injured 343 people and led to the evacuation of 17,000.

- Less than three percent of the events involve a storage vessel and result in a vapor release. Four percent involved a storage vessel and are caused by operator error. Less than two percent of the events are caused by operator error and result in a vapor release.

- Less than one percent of the events involve a storage vessel, result in a vapor release, and are caused by operator error.

Exhibit 1

DATA SOURCES FOR THE AHE DATA BASE

| National Data Sources | Number of Records | Period |
|---|---|---|
| National Response Center | 1,225 * | 1983-84 |
| United Press International | 139 | 1983-85 |
| New York Times | 46 | 1980-84 |
| Marsh & McLennan | 64 | 1956-84 |
| | 1,474 | |
| **Regional Data Sources** | | |
| Region 7 EPA | 513 | 1981-85 |
| New Orleans Times-Picayunne | 65 | 1980-81 |
| Los Angeles Times | 28 | 1980-84 |
| Chicago Tribune | 12 | 1980-81 |
| | 618 | |
| **State Data Sources** | | |
| Texas Air Control Board | 442 | 1980-85 |
| Ohio EPA | 263 | 1981-85 |
| New Jersey Department of Environmental Quality | 116 | 1983-85 |
| California: | | |
| Office of Emergency Services | 141 | 1984-85 |
| Highway Patrol | 67 | 1983-85 |
| | 1,029 | |
| TOTAL | 3,121 * | |

* *National Response Center (NRC) data included 5,032 accidental releases of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) chemicals during 1983 and 1984. Of these, the 802 events designated as air releases were all included in the AHE Data Base. One-tenth of the remaining 4,230 events were randomly selected for inclusion in the AHE Data Base. As a result, the 1,225 NRC-origin records in the AHE Data Base represent 5,032 events; and the 3,121 total records in the AHE Data Base represent 6,928 incidents.*

Exhibit 2

DISTRIBUTION OF EVENTS BY SOURCE AND YEAR

| Source | Before 1980 | 1980 | 1981 | 1982 | 1983 | 1984 | First Half 1985 | Total |
|---|---|---|---|---|---|---|---|---|
| National Response Center | -- | -- | -- | -- | 539 | 679 | 7 | 1225 |
| United Press International | -- | -- | -- | 1 | 56 | 48 | 34 | 139 |
| Marsh & McLennan | 48 | 5 | 1 | 3 | 4 | 3 | -- | 64 |
| EPA Region 7 | 1 | 1 | 101 | 144 | 108 | 107 | 51 | 513 |
| Newspapers: | | | | | | | | |
| Los Angeles Times | 1 | 5 | 8 | 10 | 3 | 1 | -- | 28 |
| New Orleans Times-Picayunne | -- | 31 | 34 | -- | -- | -- | -- | 65 |
| Chicago Tribune | -- | 7 | 5 | -- | -- | -- | -- | 12 |
| New York Times | -- | 10 | 19 | 12 | 4 | 1 | -- | 46 |
| Subtotal | 1 | 53 | 66 | 22 | 7 | 2 | 0 | 151 |
| States: | | | | | | | | |
| Calif. Office of Emergency Services | -- | -- | -- | -- | -- | 119 | 22 | 141 |
| California Highway Patrol | -- | -- | -- | -- | 32 | 32 | 3 | 67 |
| Texas Air Control Board | -- | 19 | 66 | 64 | 57 | 127 | 109 | 442 |
| Ohio EPA | -- | -- | 1 | 77 | 59 | 103 | 23 | 263 |
| New Jersey Department of Environmental Quality | -- | -- | -- | 1 | 46 | 36 | 33 | 116 |
| Subtotal | 0 | 19 | 67 | 142 | 194 | 417 | 190 | 1,029 |
| TOTAL | 50 | 78 | 235 | 312 | 908 | 1,256 | 282 | 3,121 |

[redacted]Exh[redacted] 3 [redacted]

# NUMBER OF EVENTS IN DATABASE

By Source of Event

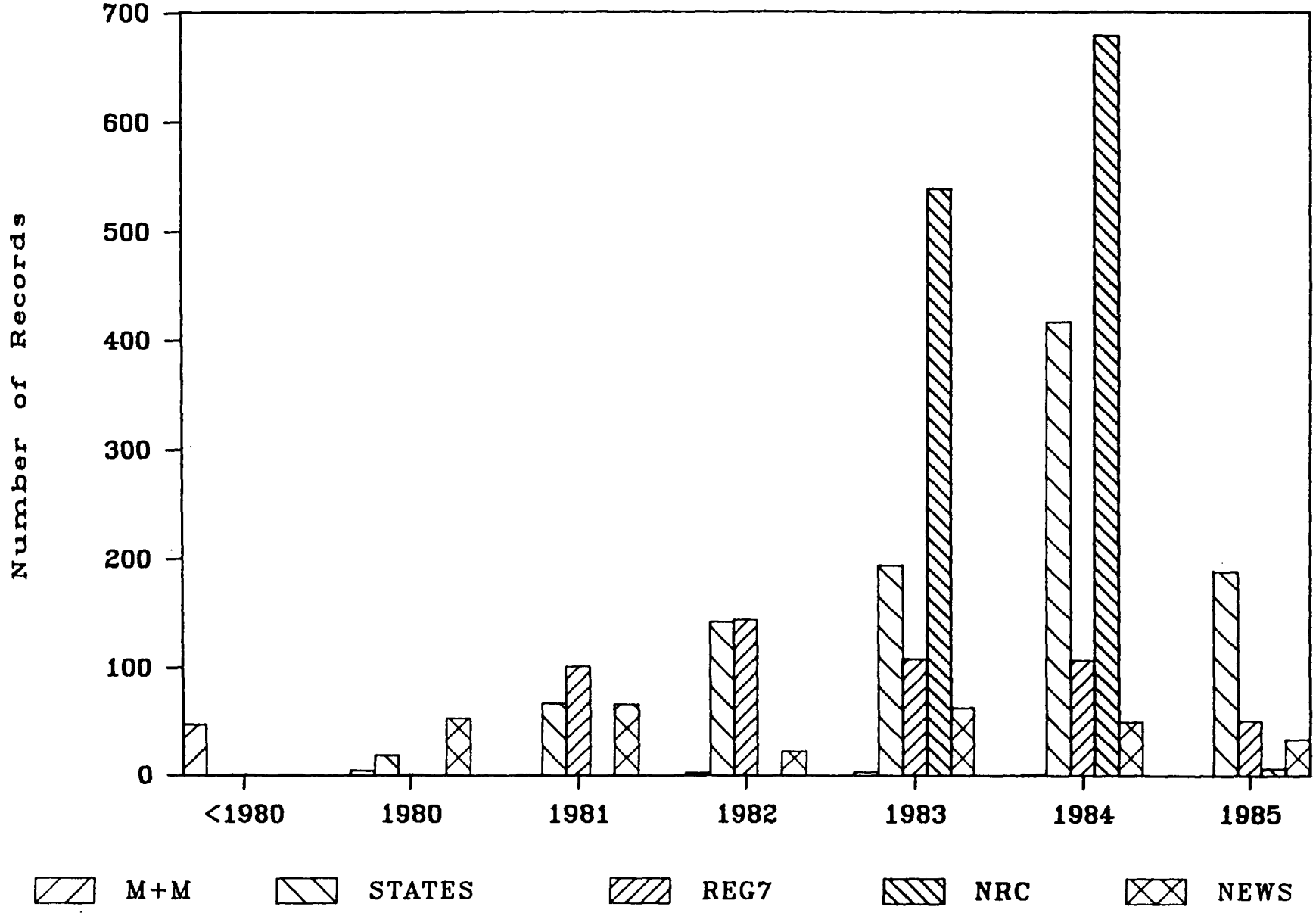


Exhibit 4

# NUMBER OF EVENTS IN DATABASE

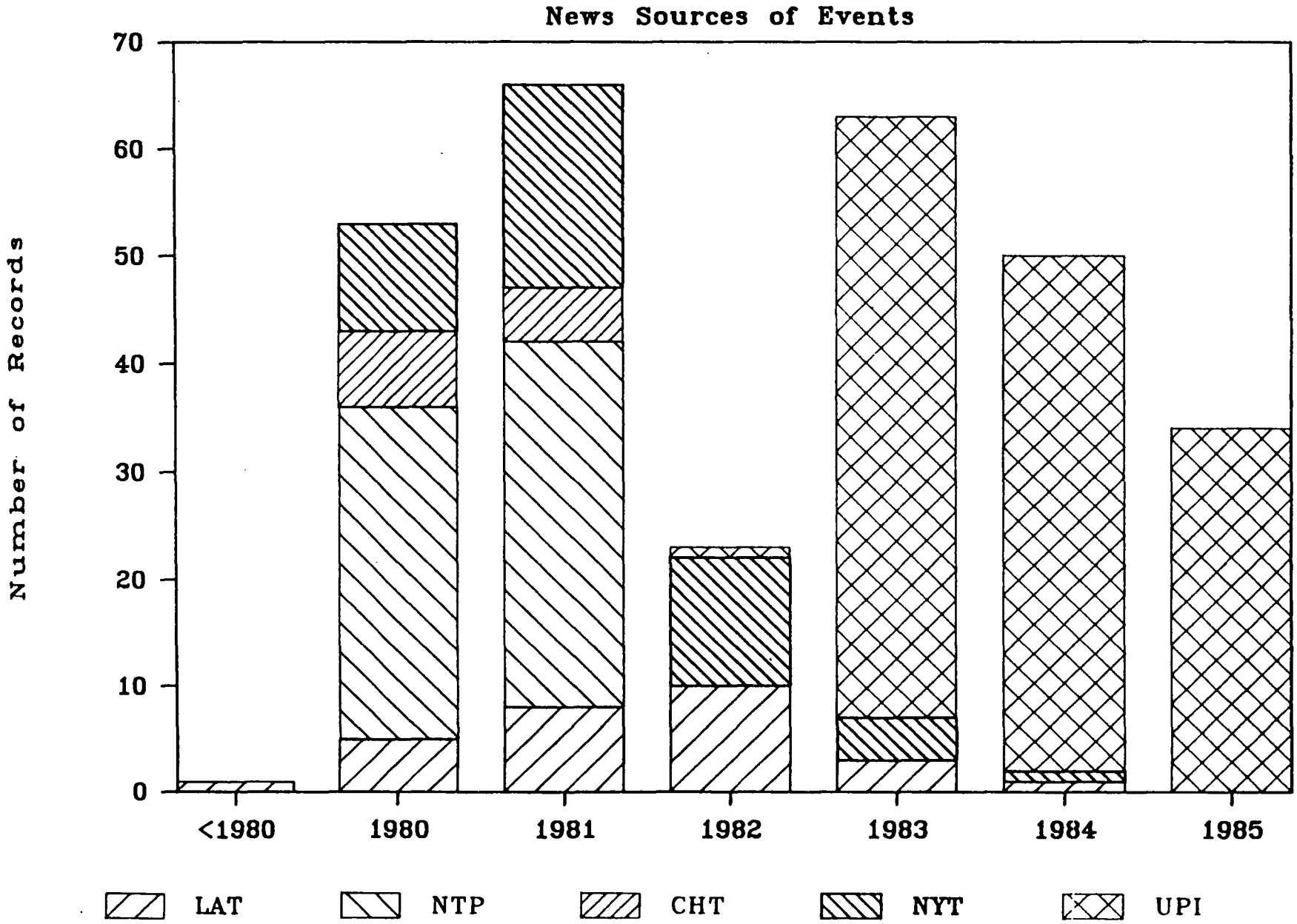
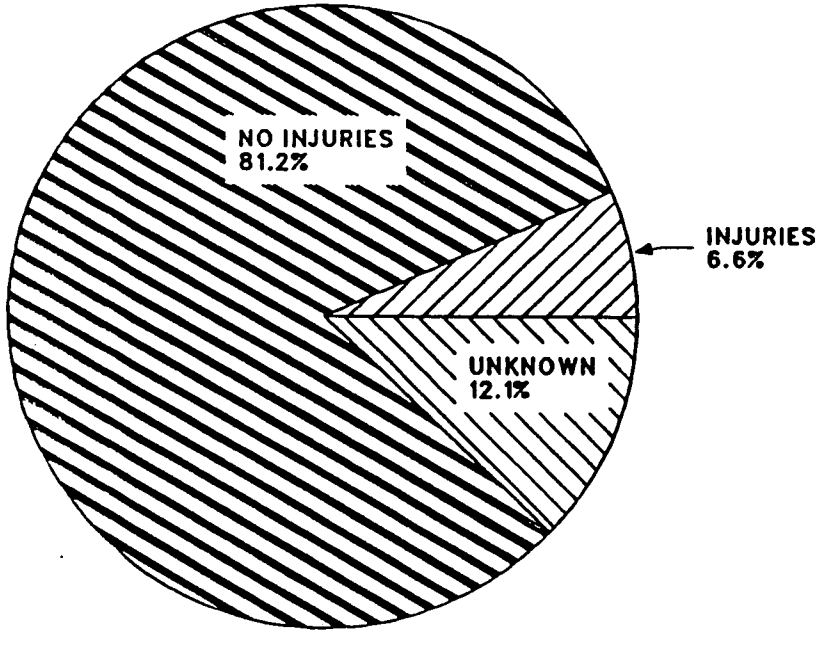


Exhibit 5

# ACUTE HAZARDOUS EVENTS DATABASE

## OCCURRENCE OF INJURIES

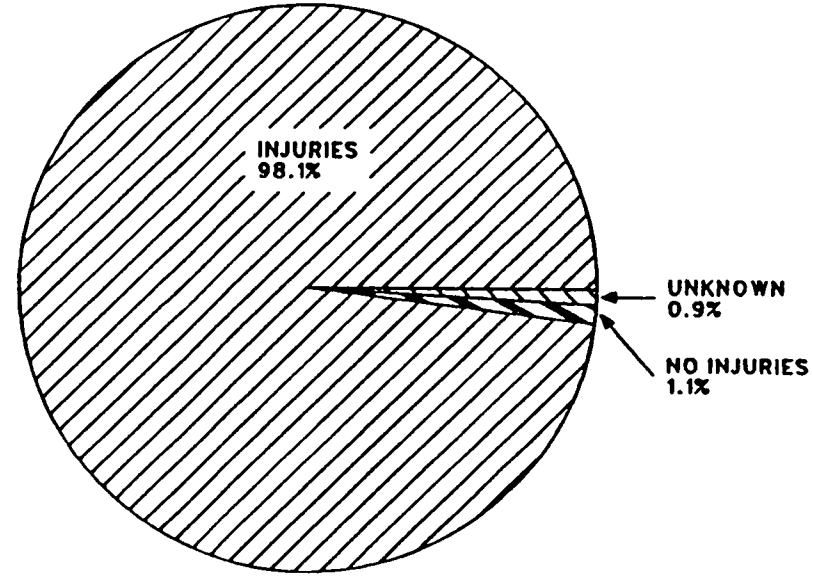
*ALL EVENTS*




NUMBER OF EVENTS = 6928

## OCCURRENCE OF INJURIES

*DEATH/INJURY EVENTS*




NUMBER OF EVENTS = 468

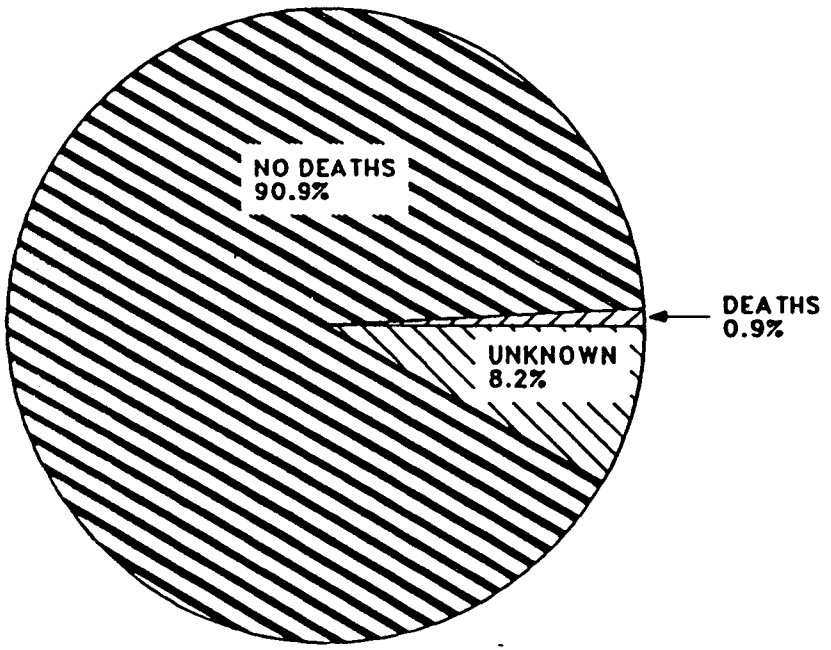
IEc/MTDS

Exhibit 6

# ACUTE HAZARDOUS EVENTS DATABASE

## OCCURRENCE OF DEATHS

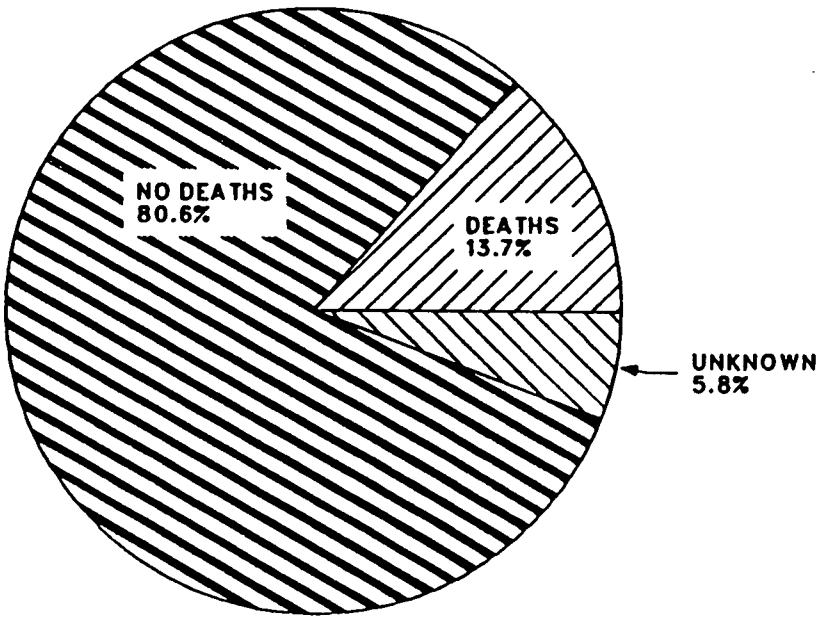
*ALL EVENTS*




NUMBER OF EVENTS = 6928

## OCCURRENCE OF DEATHS

*DEATH/INJURY EVENTS*




NUMBER OF EVENTS = 468

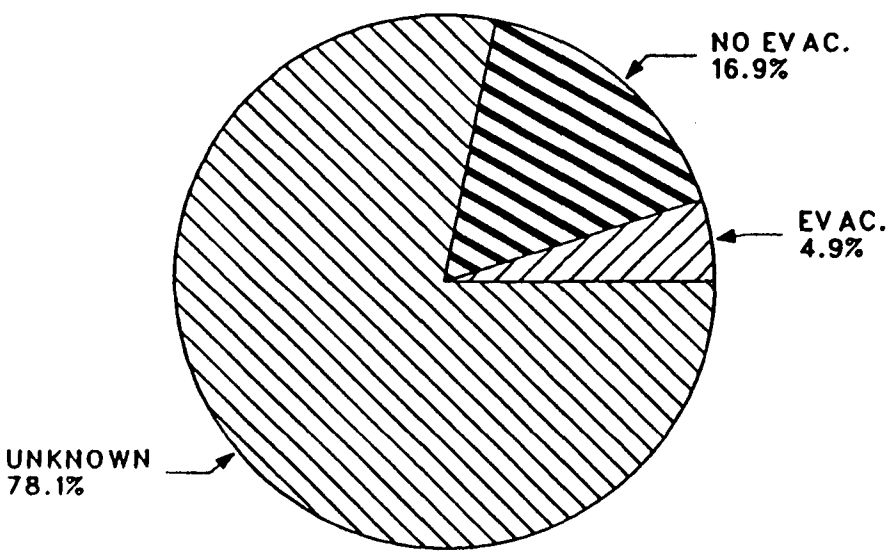
IEc/MTDS

Exhibit 7

# ACUTE HAZARDOUS EVENTS DATABASE

## OCCURRENCE OF EVACUATIONS

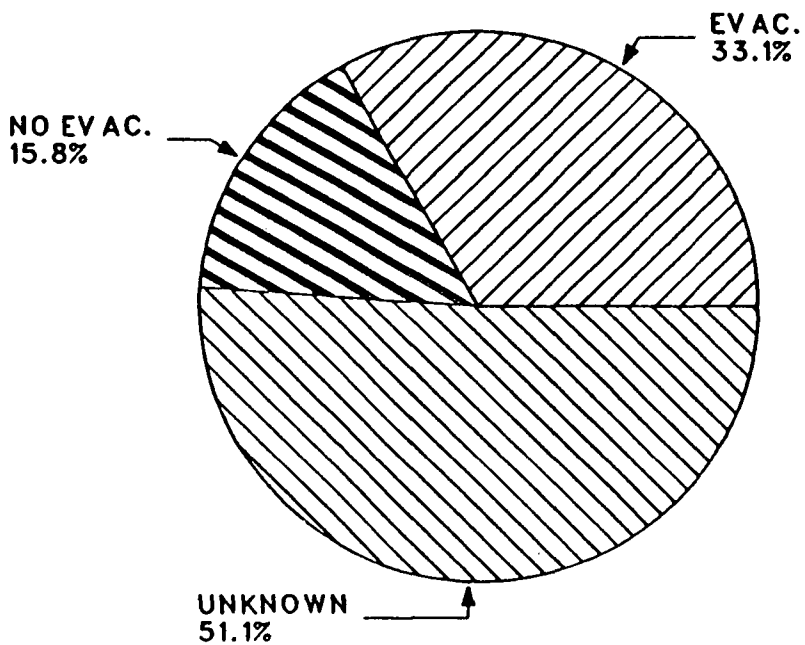
*ALL EVENTS*




NUMBER OF EVENTS = 6928

## OCCURRENCE OF EVACUATIONS

*DEATH/INJURY EVENTS*




NUMBER OF EVENTS = 468

IEc/MTDS

Exhibit 8

TWENTY MOST FREQUENTLY REPORTED SUBSTANCES

| Substance | Reportable Quantity (RQ) (lbs) |
|---|---|
| Polychlorinated Biphenyls (PCBs) | 10 |
| Sulfuric Acid | 1000 |
| Anhydrous Ammonia | 100 |
| Chlorine | 10 |
| Hydrochloric Acid | 5000 |
| Sodium Hydroxide | 1000 |
| Methyl Alcohol | 5000 |
| Nitric Acid | 1000 |
| Methyl Chloride | 1 |
| Toluene | 1000 |
| Vinyl Chloride | 1 |
| Fertilizer | N/A |
| Solvent | N/A |
| Phosphoric Acid | 5000 |
| Benzene | 1000 |
| Ethylene Dichloride | 100 |
| Styrene | 1000 |
| Hydrogen Sulfide | 100 |
| Tetrachloroethylene | 1 |
| Sulfur Dioxide | N/A |

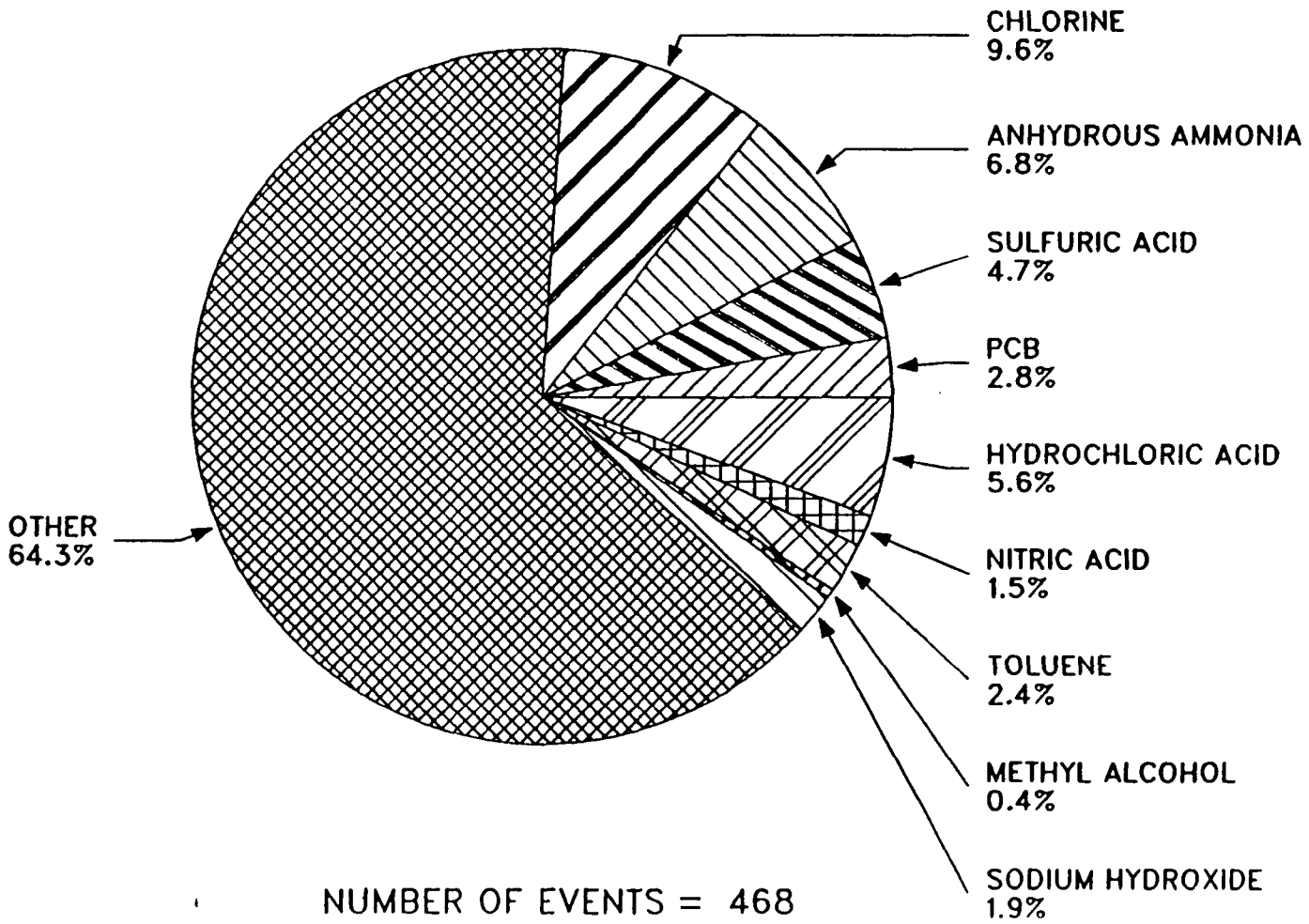
---

Note: N/A means a reportable quantity was not available for that substance.

[redacted] [redacted]hib[redacted]

# ACUTE HAZARDOUS EVENTS DATABASE
## DISTRIBUTION OF EVENTS BY CHEMICAL FOR DEATH/INJURY EVENTS

*10 CHEMICALS REPRESENTING THE LARGEST NUMBER OF TOTAL EVENTS*

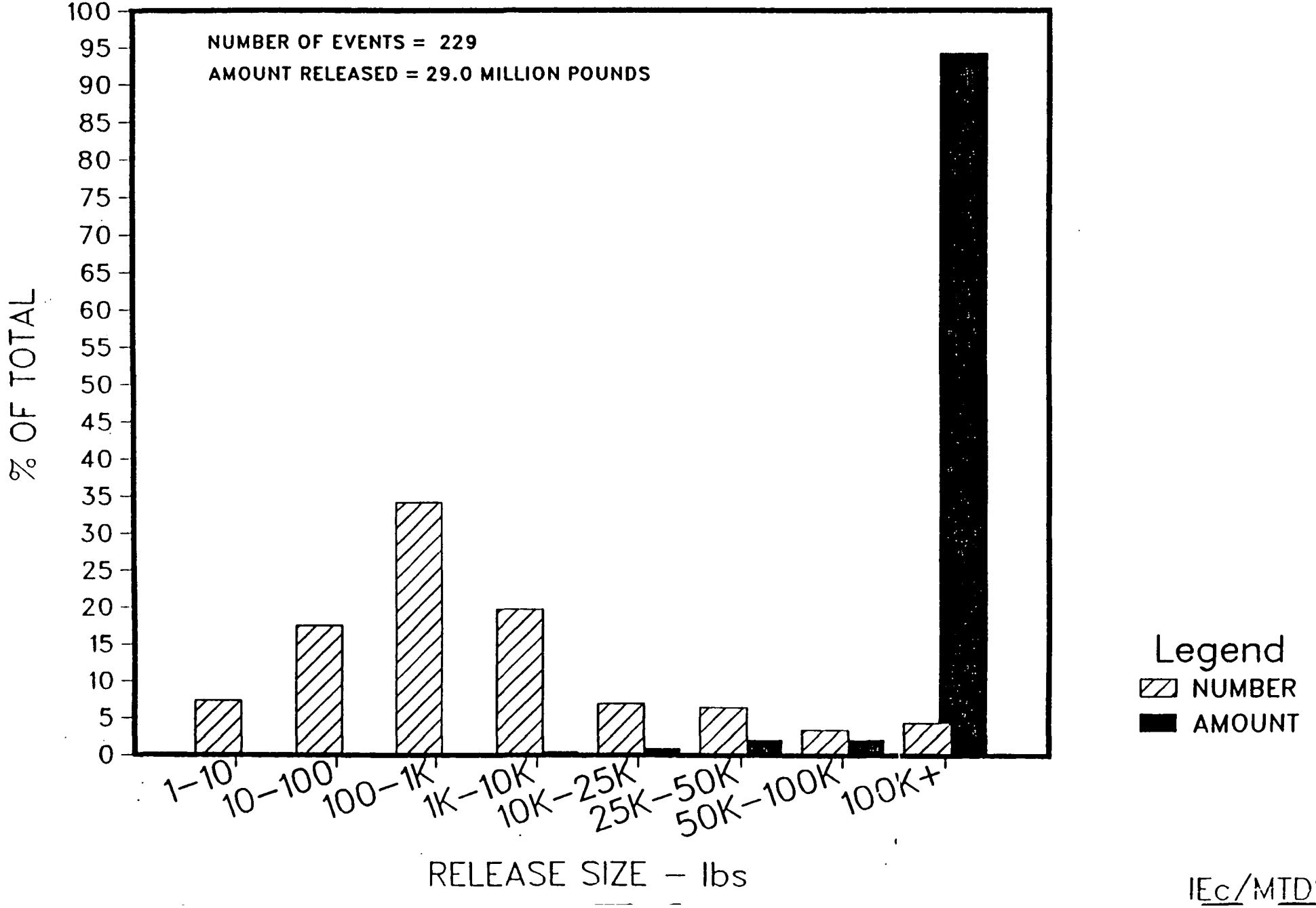



NUMBER OF EVENTS = 468

IEc/MTDS

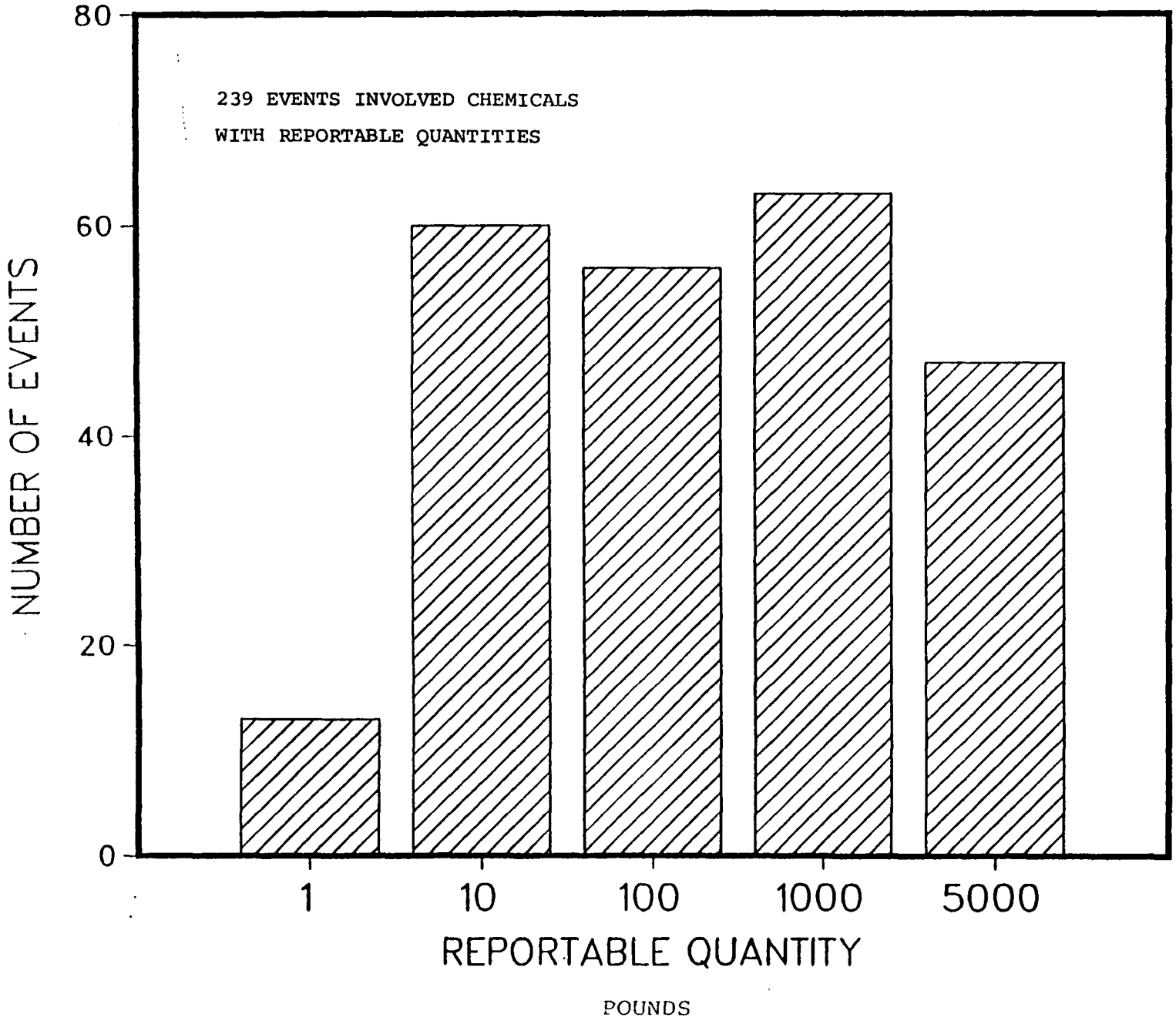
Exhibit 10

# ACUTE HAZARDOUS EVENTS DATABASE FREQUENCY DISTRIBUTION BY RELEASE SIZE FOR EVENTS INVOLVING DEATHS AND INJURIES




IEc/MTDS

# ACUTE HAZARDOUS EVENTS DATABASE
## NUMBER OF EVENTS BY REPORTABLE QUANTITY FOR DEATH AND INJURY EVENTS




IEc/MTDS

Exhibit 12

# ACUTE HAZARDOUS EVENTS DATABASE QUANTITY RELEASED/REPORTABLE QUANTITY FOR DEATH AND INJURY EVENTS

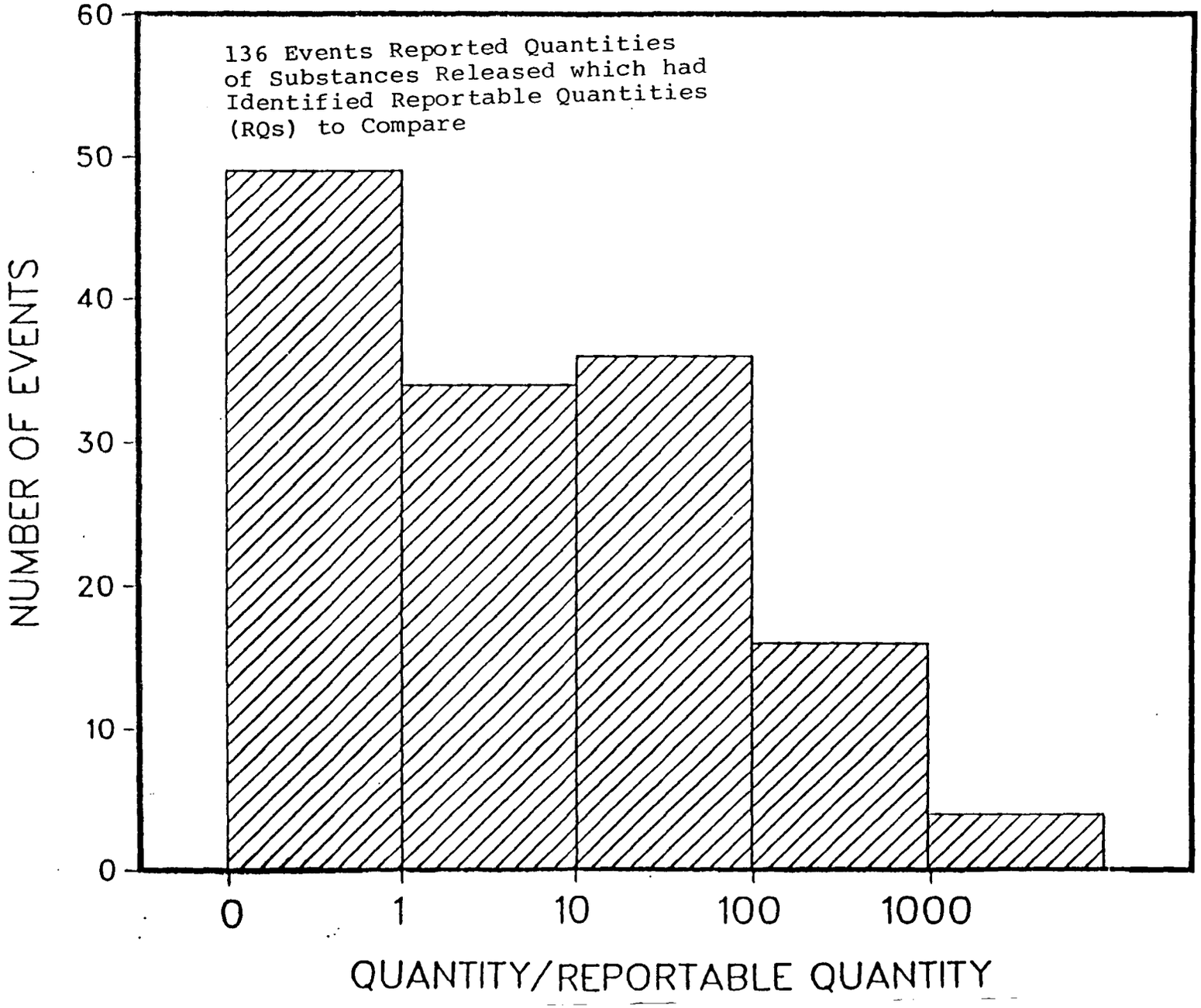


Exhibit 12

# ROLE of FIRE/EXPLOSION vs TOXICITY

As Apparent Cause of Deaths or Injuries

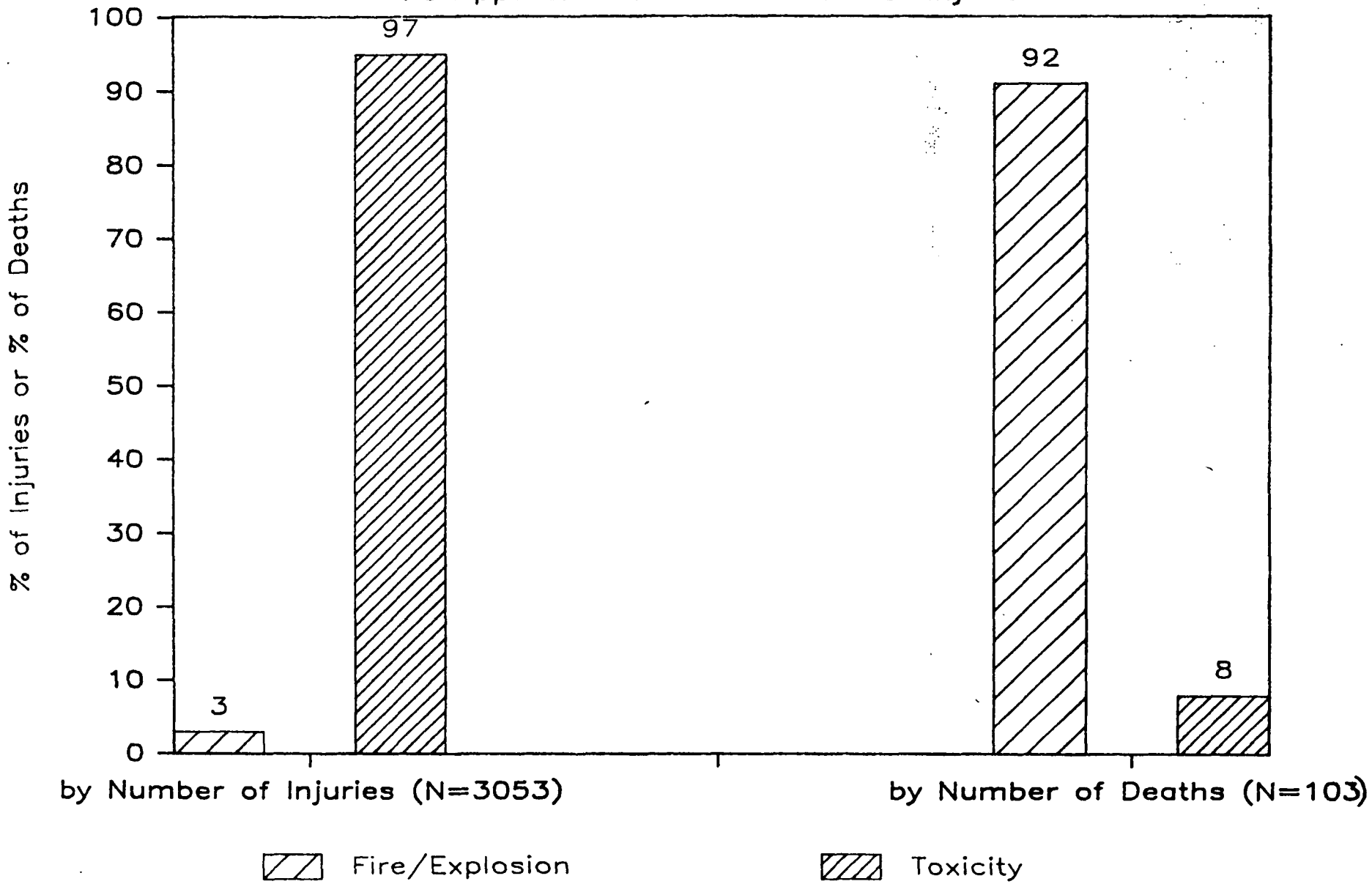
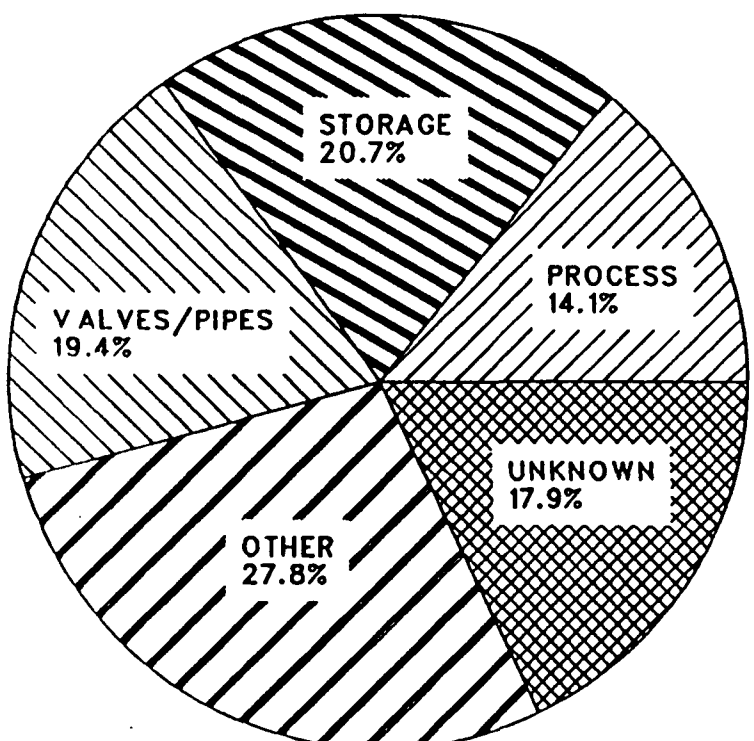


Exhibit 14

# ACUTE HAZARDOUS EVENTS DATABASE

## IN-PLANT EVENTS BY LOCATION

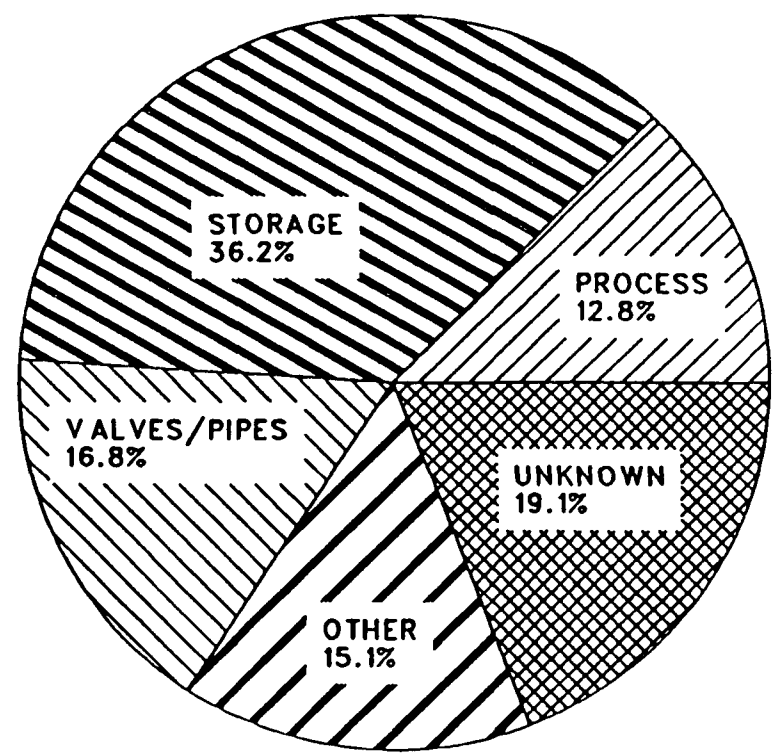
*ALL EVENTS*




NUMBER OF EVENTS = 5179

## IN-PLANT EVENTS BY LOCATION

*DEATH/INJURY EVENTS*




NUMBER OF EVENTS = 304

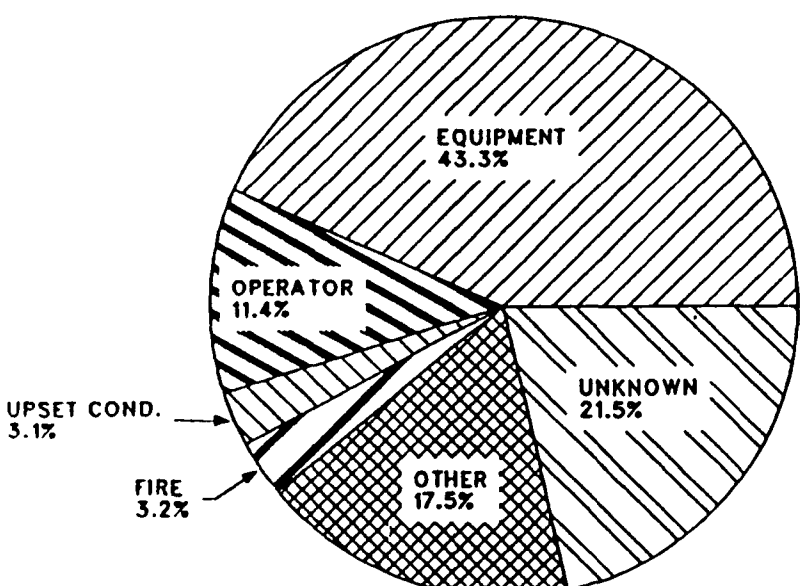
IEc/MTDS

Exhibit 15

# ACUTE HAZARDOUS EVENTS DATABASE

## IN-PLANT EVENTS BY CAUSE

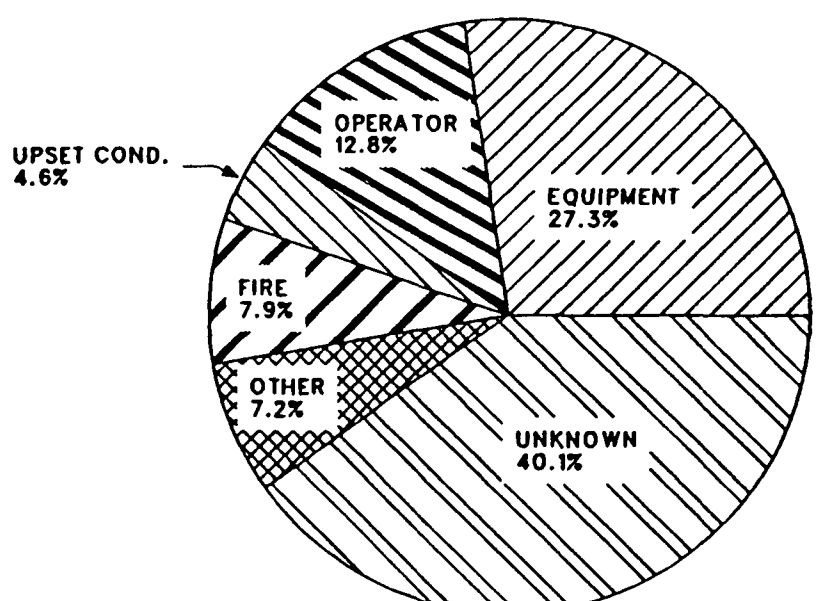
*ALL EVENTS*




NUMBER OF EVENTS = 5179

## IN-PLANT EVENTS BY CAUSE

*DEATH/INJURY EVENTS*




NUMBER OF EVENTS = 304

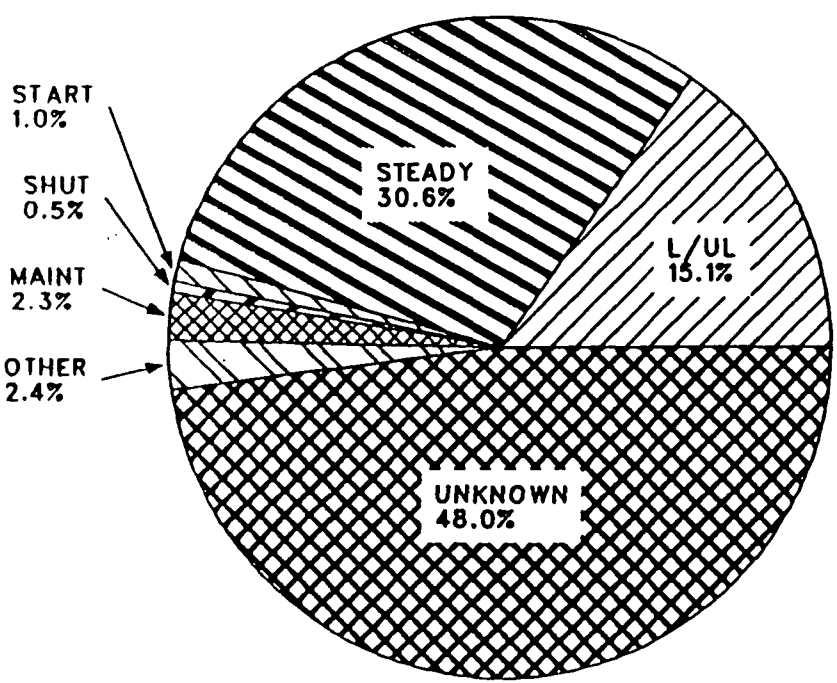
IEc/MTDS

Exhibit 16

# ACUTE HAZARDOUS EVENTS DATABASE

## IN-PLANT EVENTS BY CONFIGURATION

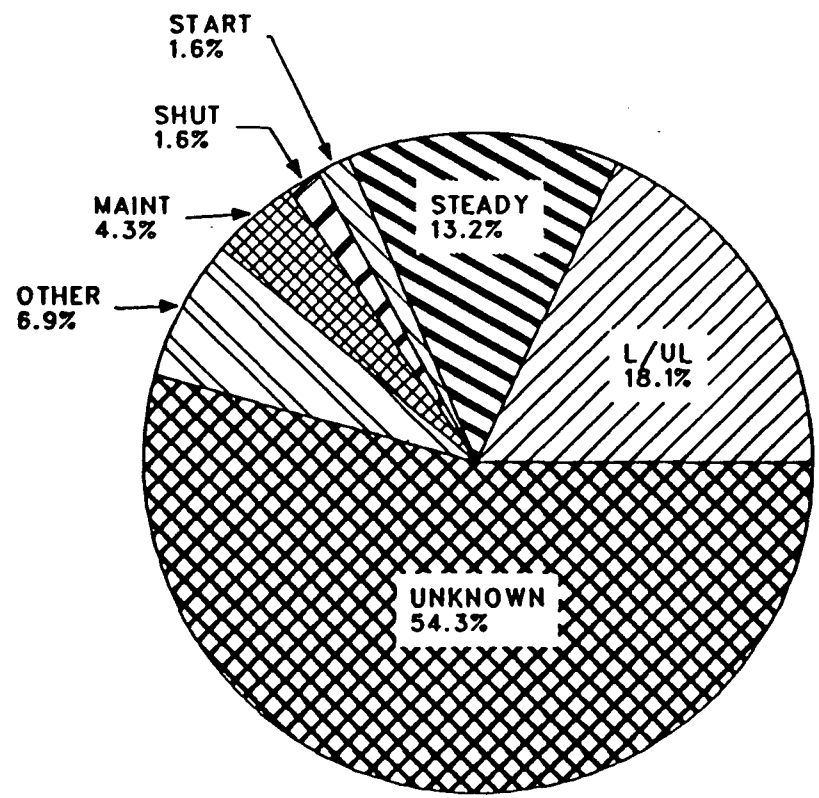
*ALL EVENTS*




NUMBER OF EVENTS = 5179

## IN-PLANT EVENTS BY CONFIGURATION

*DEATH/INJURY EVENTS*

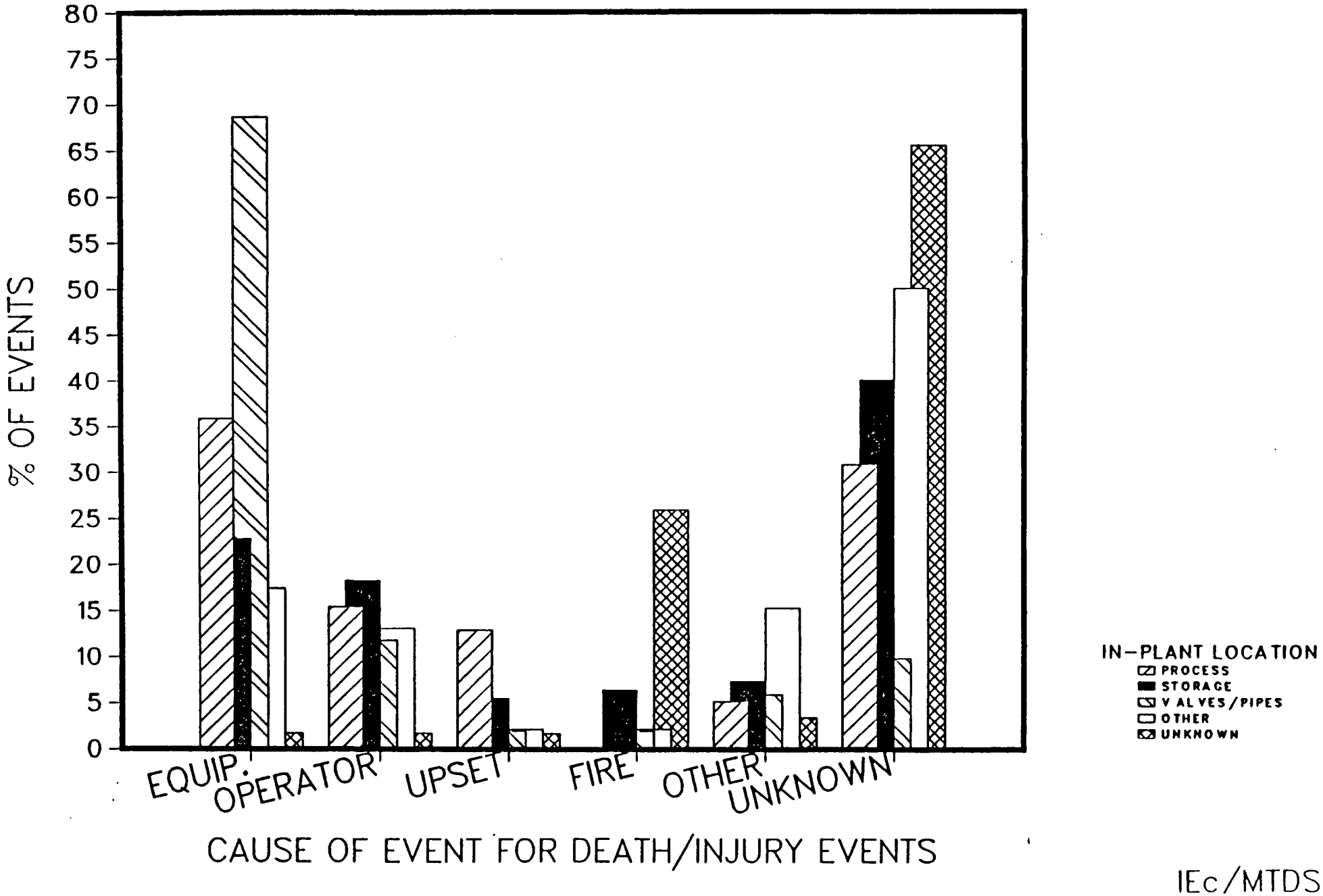



NUMBER OF EVENTS = 304

IEc/MTDS

Exhibit 17

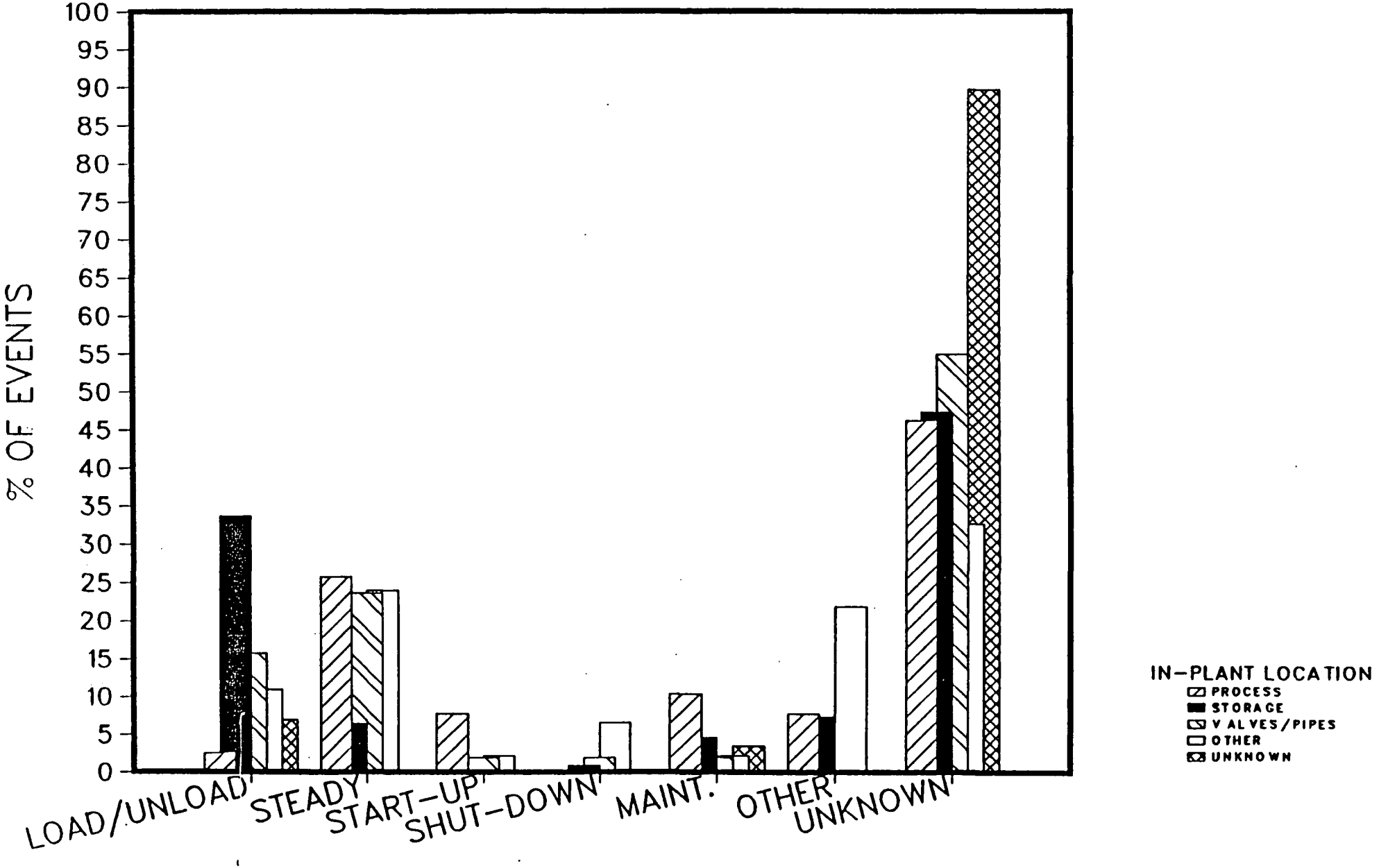
# ACUTE HAZARDOUS EVENTS DATABASE
# IN-PLANT EVENTS BY CAUSE AND LOCATION




IEc/MTDS

Exhibit 18

# ACUTE HAZARDOUS EVENTS DATABASE
# IN-PLANT EVENTS BY CONFIGURATION AND LOCATION

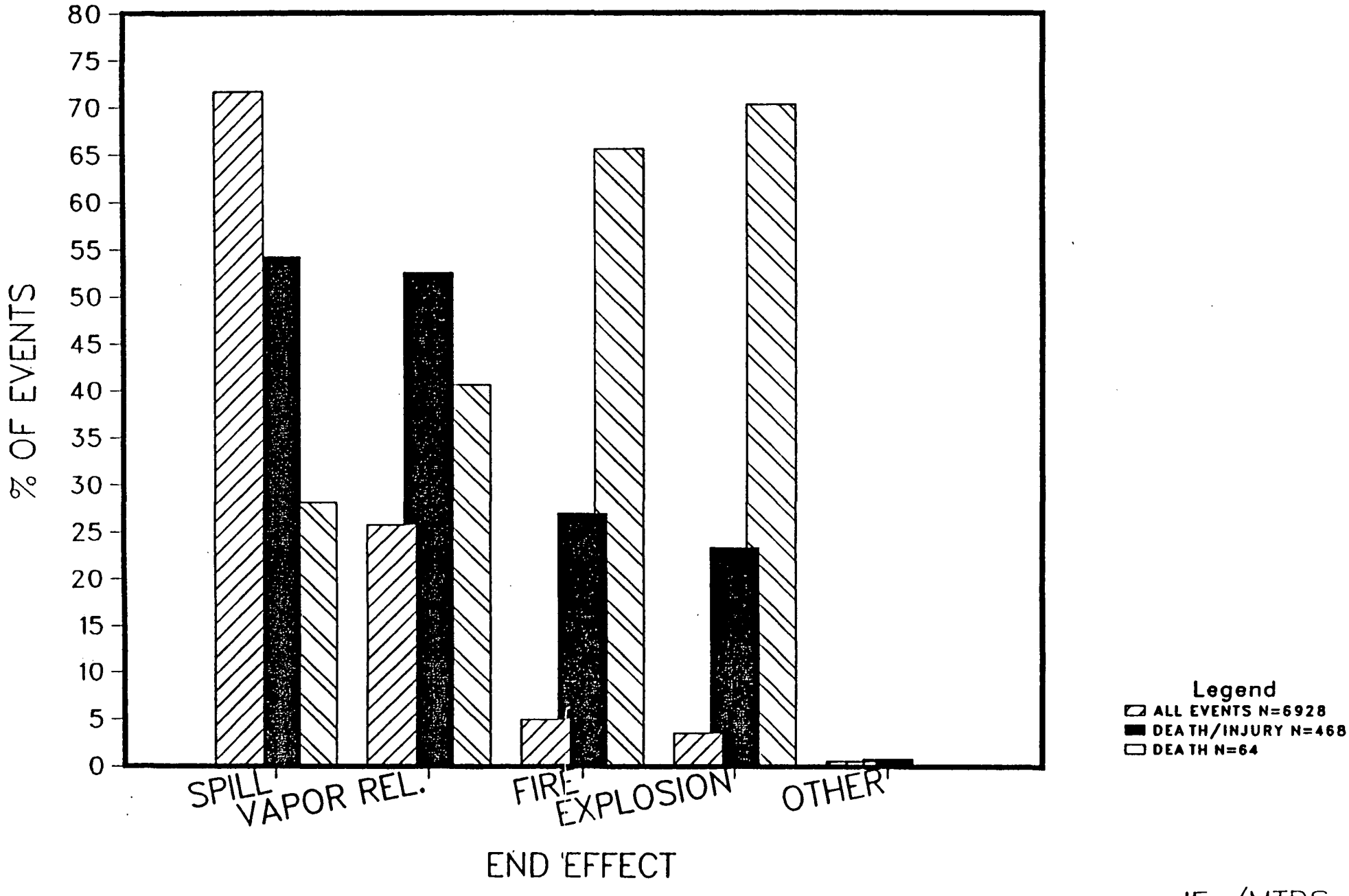



PLANT CONFIGURATION FOR DEATH/INJURY EVENTS

IEc/MTDS

Exhibit 19

# ACUTE HAZARDOUS EVENTS DATABASE
# FREQUENCY OF REPORTED END EFFECTS



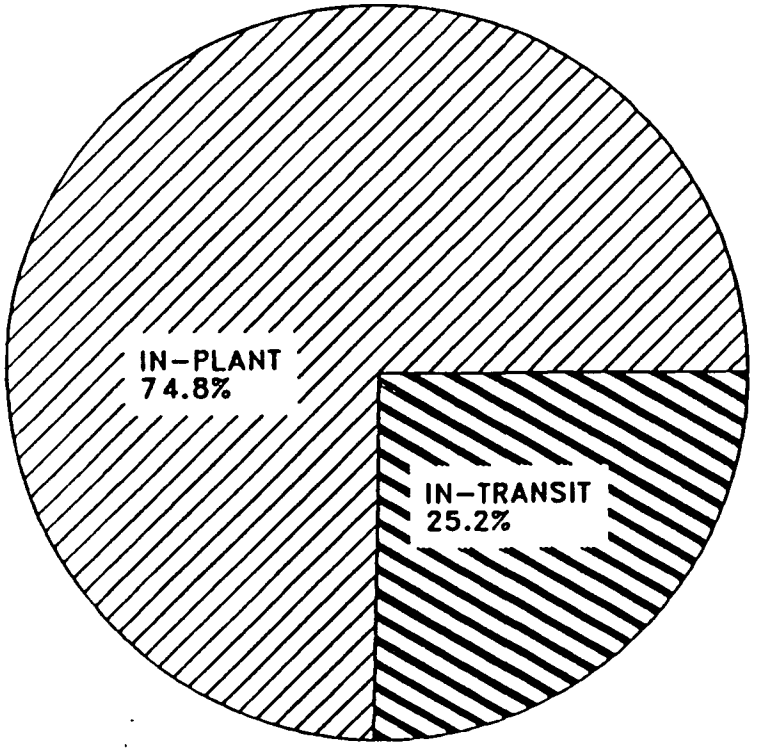

IEc/MTDS

Exhibit 20

# ACUTE HAZARDOUS EVENTS DATABASE

## IN–PLANT VS. IN–TRANSIT EVENTS

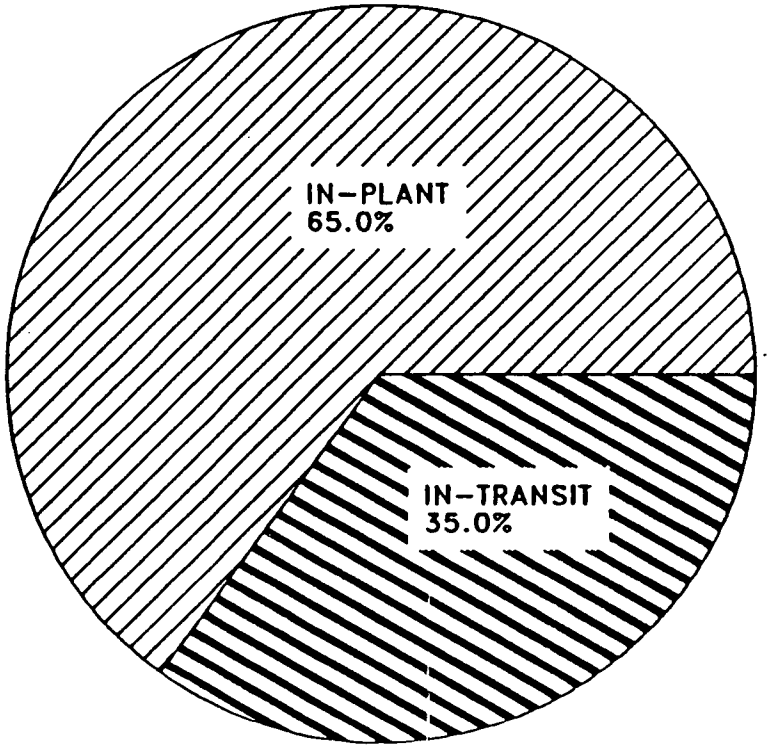
*ALL EVENTS*




NUMBER OF EVENTS = 6928

## IN–PLANT VS. IN–TRANSIT EVENTS

*DEATH/INJURY EVENTS*




NUMBER OF EVENTS = 468

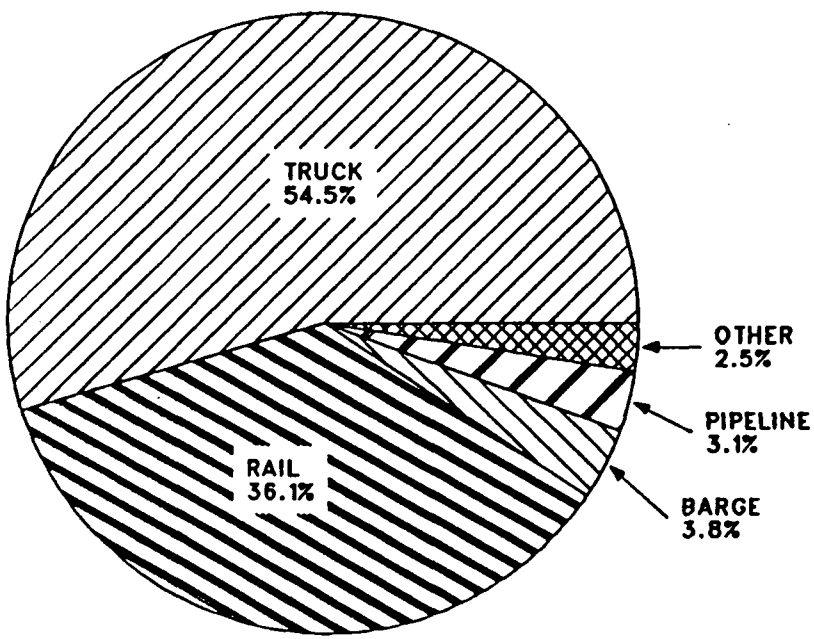
IEc/MTDS

Exhibit 21

# ACUTE HAZARDOUS EVENTS DATABASE

## IN–TRANSIT EVENTS BY MODE

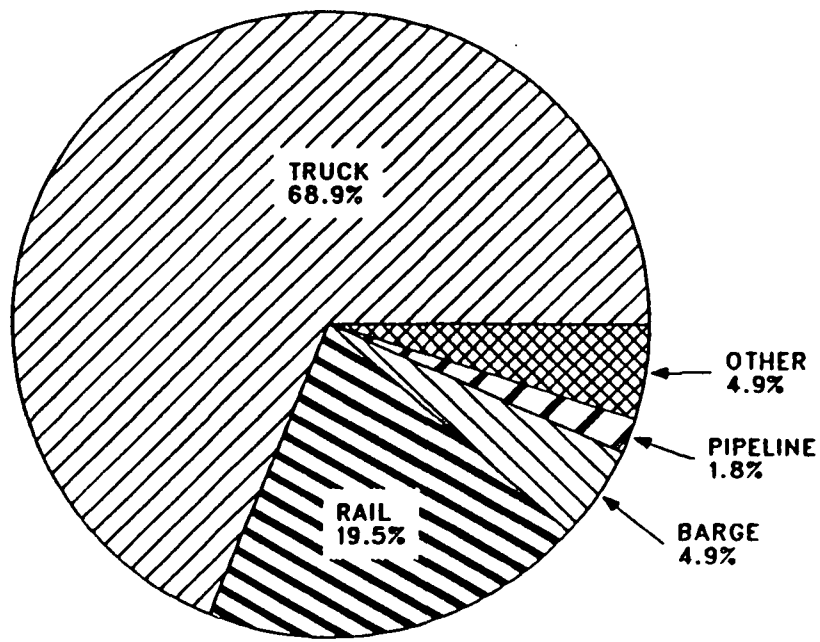
*ALL EVENTS*




NUMBER OF EVENTS = 1749

## IN–TRANSIT EVENTS BY MODE

*DEATH/INJURY EVENTS*




NUMBER OF EVENTS = 164

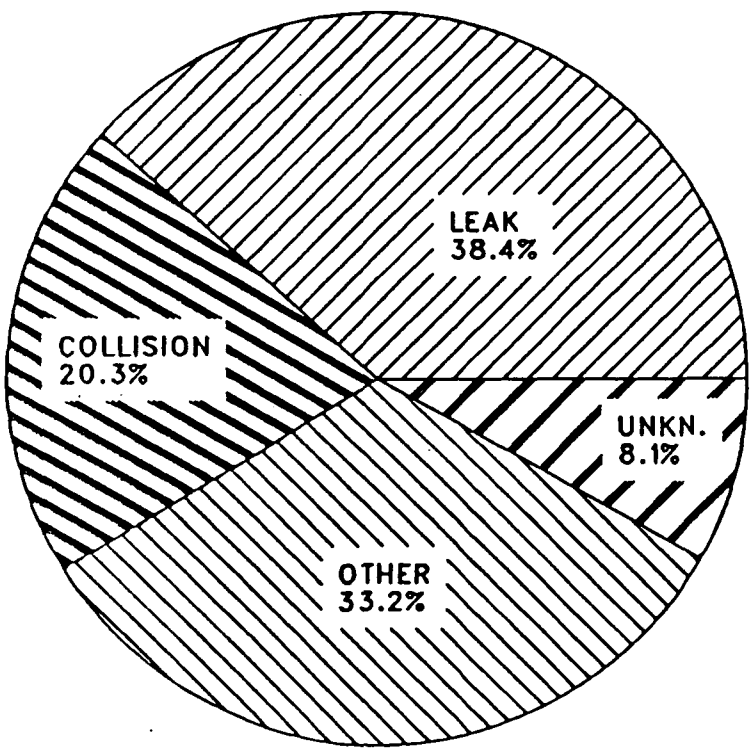
IEc/MTDS

Exhibit 22

# ACUTE HAZARDOUS EVENTS DATABASE

## IN-TRANSIT EVENTS BY CAUSE

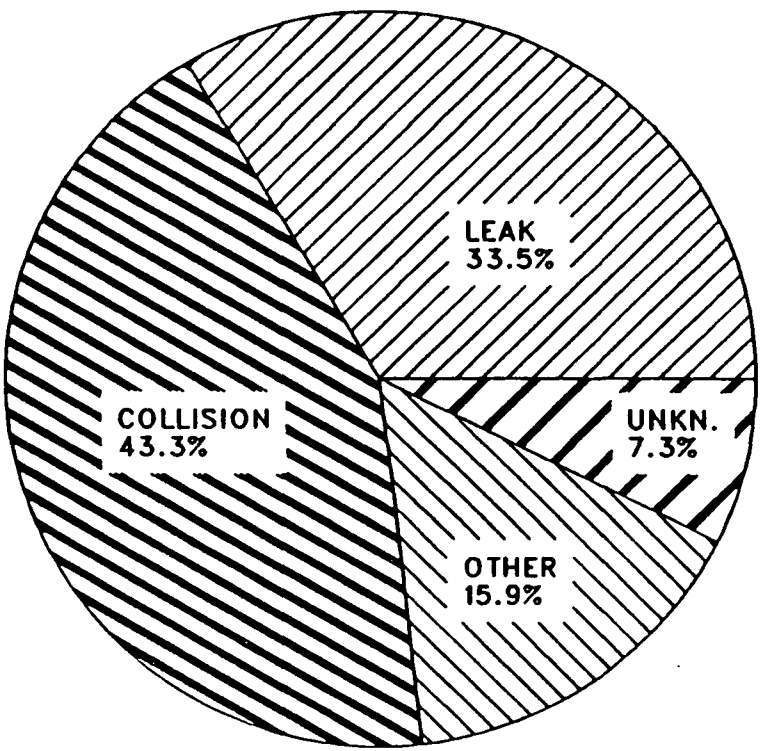
*ALL EVENTS*




NUMBER OF EVENTS = 1749

## IN-TRANSIT EVENTS BY CAUSE

*DEATH/INJURY EVENTS*



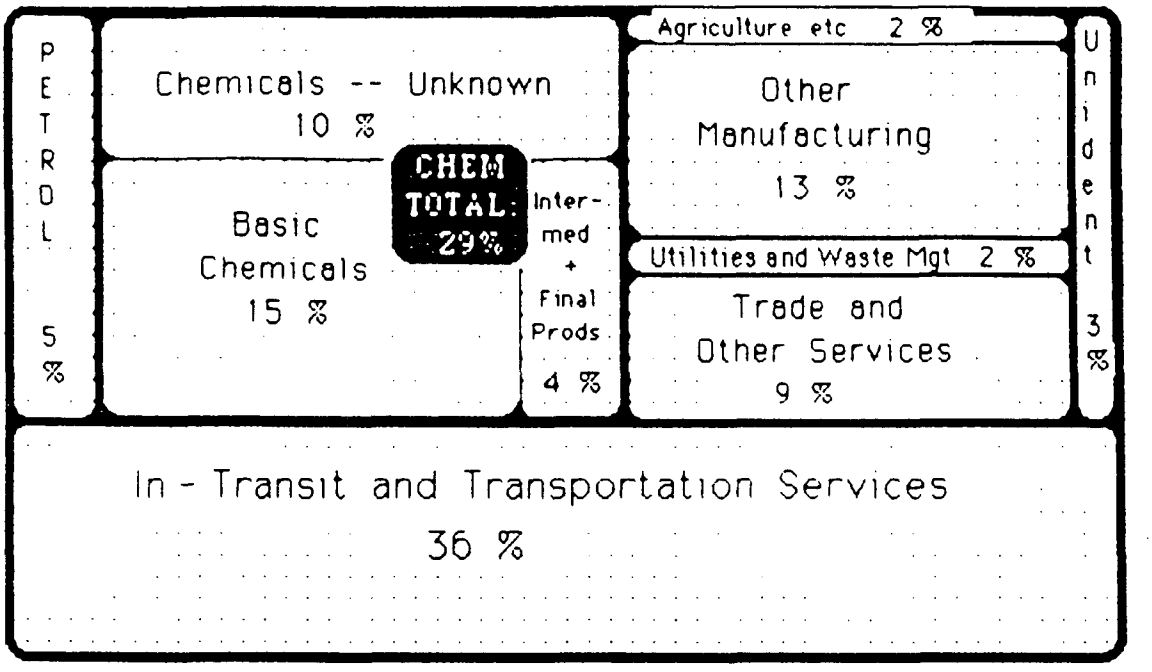

NUMBER OF EVENTS = 164

IEc/MTDS

Exhibit 23

# Reported Number of Injuries

## Distribution by Industry Sector

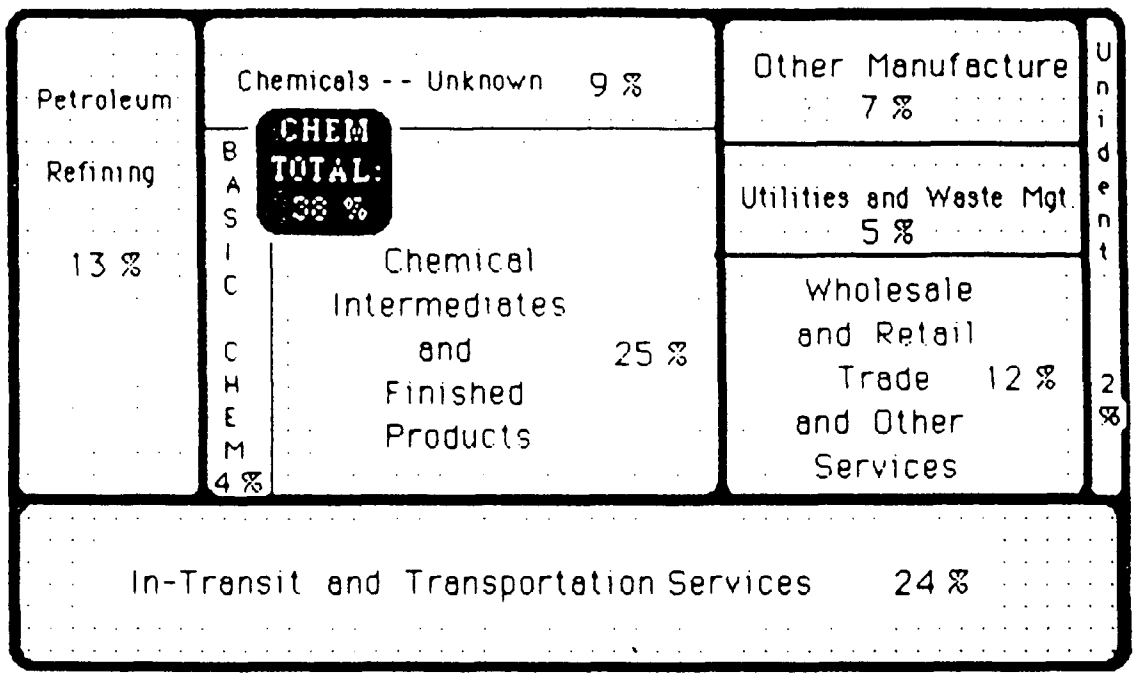



TOTAL INJURIES: 4717 in five year period

Exhibit 24

# Reported Number of Deaths

## Distribution by Industry Sector

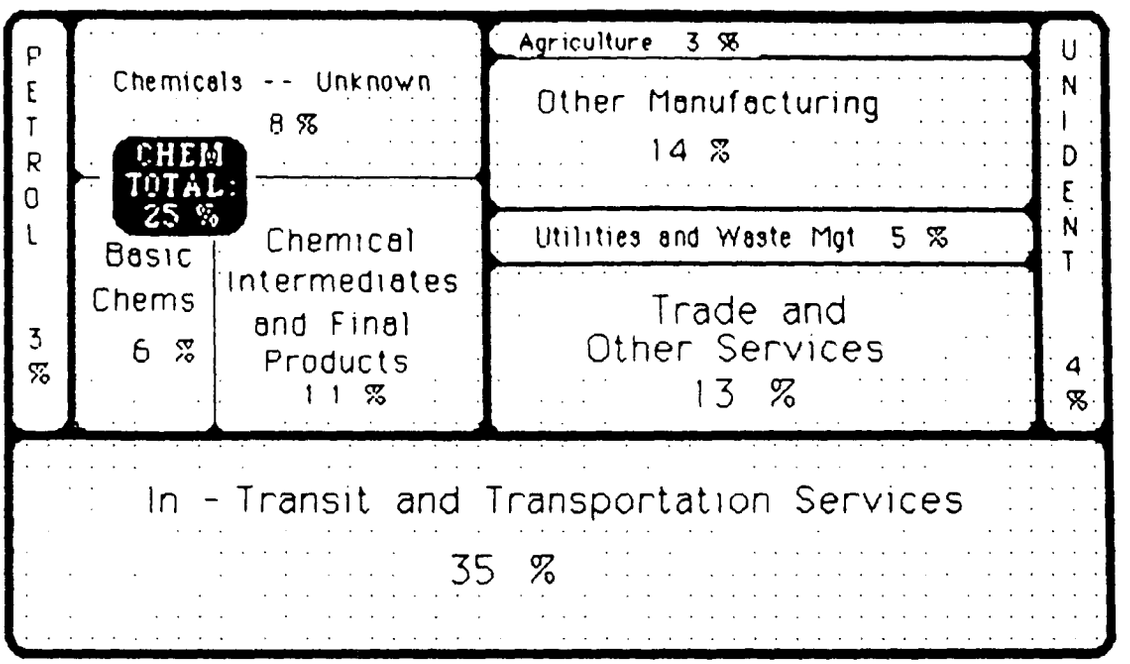



TOTAL DEATHS 138 in five year period

Exhibit 25

# Number of Events With Reported Evacuations

## Distribution by Industry Sector




TOTAL EVENTS WITH EVACUATIONS: 155 in five year period

(NOTE. These events include only those with reported deaths or injuries. Other evacuation events are not included.)

Exhibit 26

# END EFFECTS: DEATH OR INJURY EVENTS

FIXED FACILITIES -- BY INDUSTRY TYPE

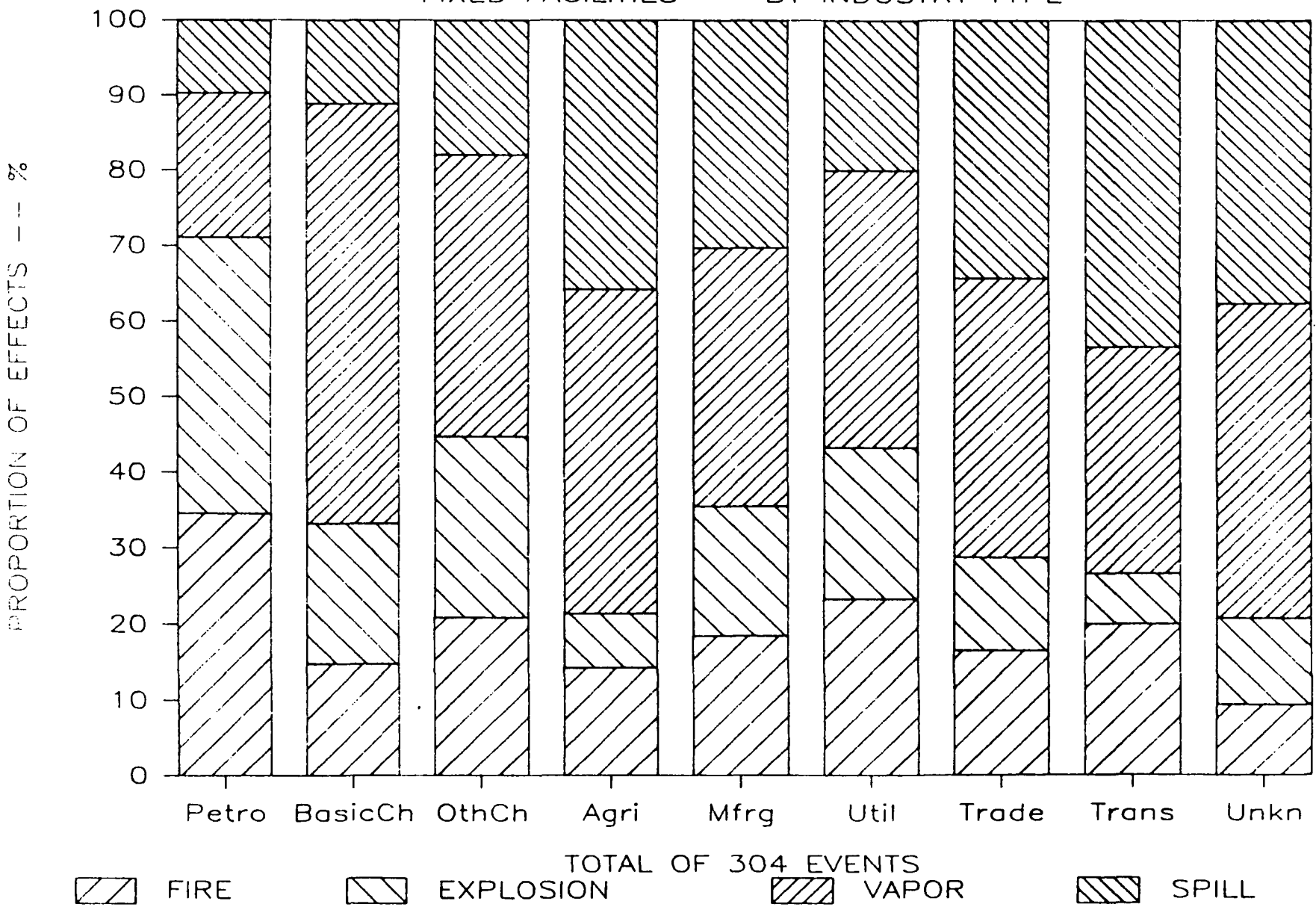


Exhibit 27

# PROPERTY DAMAGE

From 64 Major Domestic Accidents

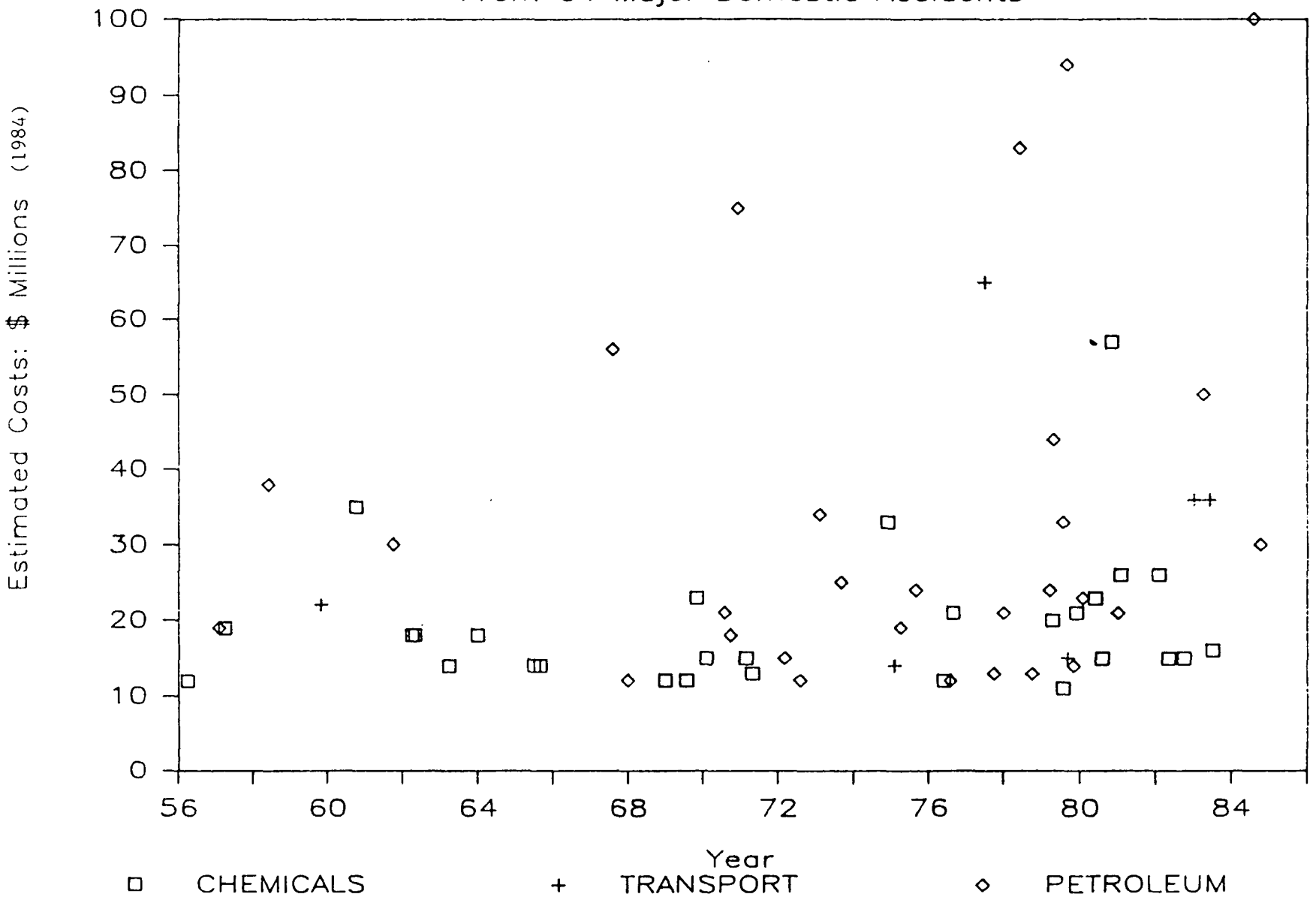
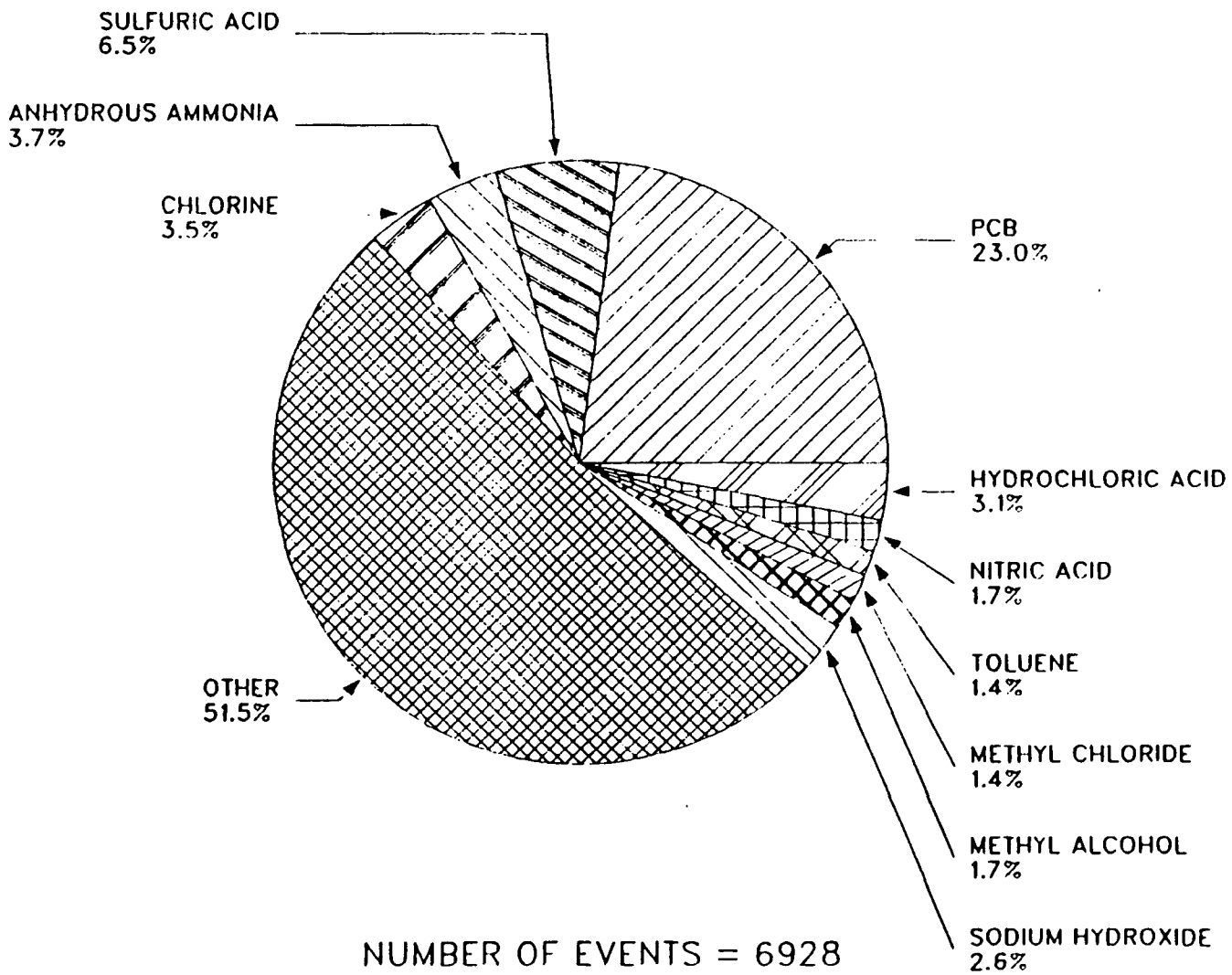


Exhibit 28

# ACUTE HAZARDOUS EVENTS DATABASE
# DISTRIBUTION OF EVENTS BY CHEMICAL FOR ALL EVENTS

## *10 CHEMICALS REPRESENTING THE LARGEST NUMBER OF EVENTS*




NUMBER OF EVENTS = 6928

IEc/MTDS

Exhibit 29

# DISTRIBUTION OF 770 NAMED SUBSTANCES

By SIC Group of Substance Released

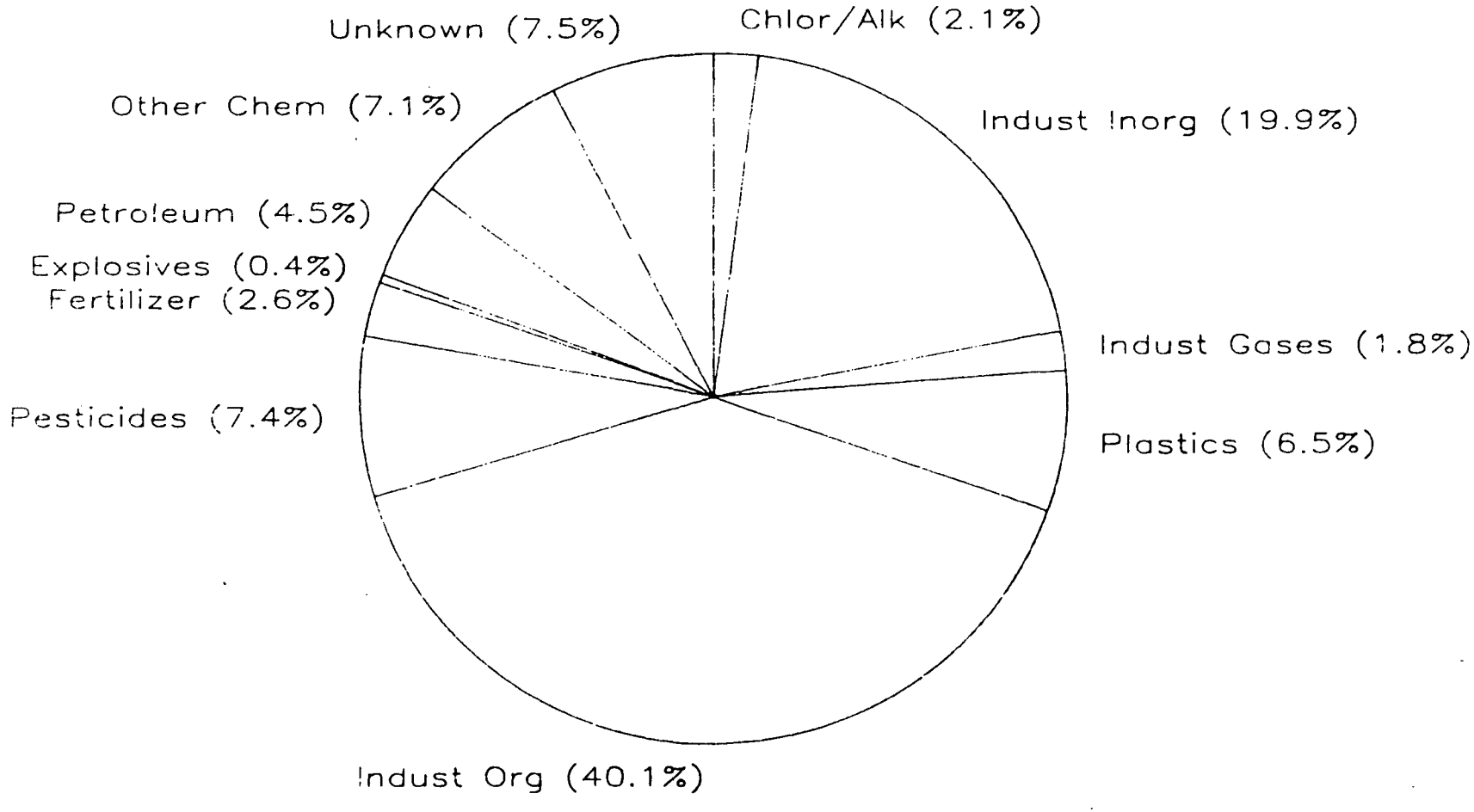


Exhibit 30

# DISTRIBUTION OF TOTAL EVENTS

By SIC Group of Substance Released

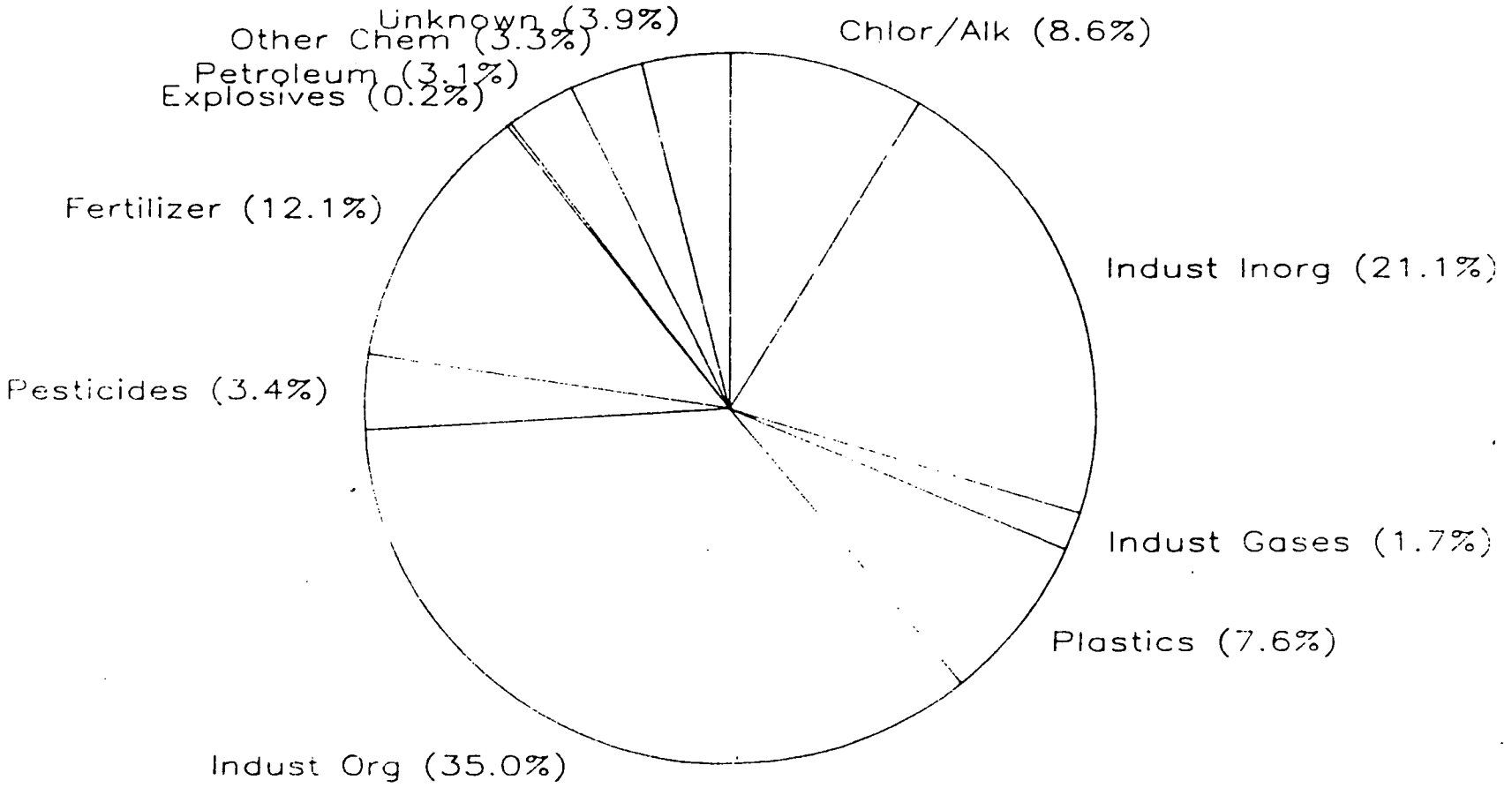


Exhibit 31

# DISTRIBUTION OF QUANTITIES RELEASED

By SIC Group of Substance Released

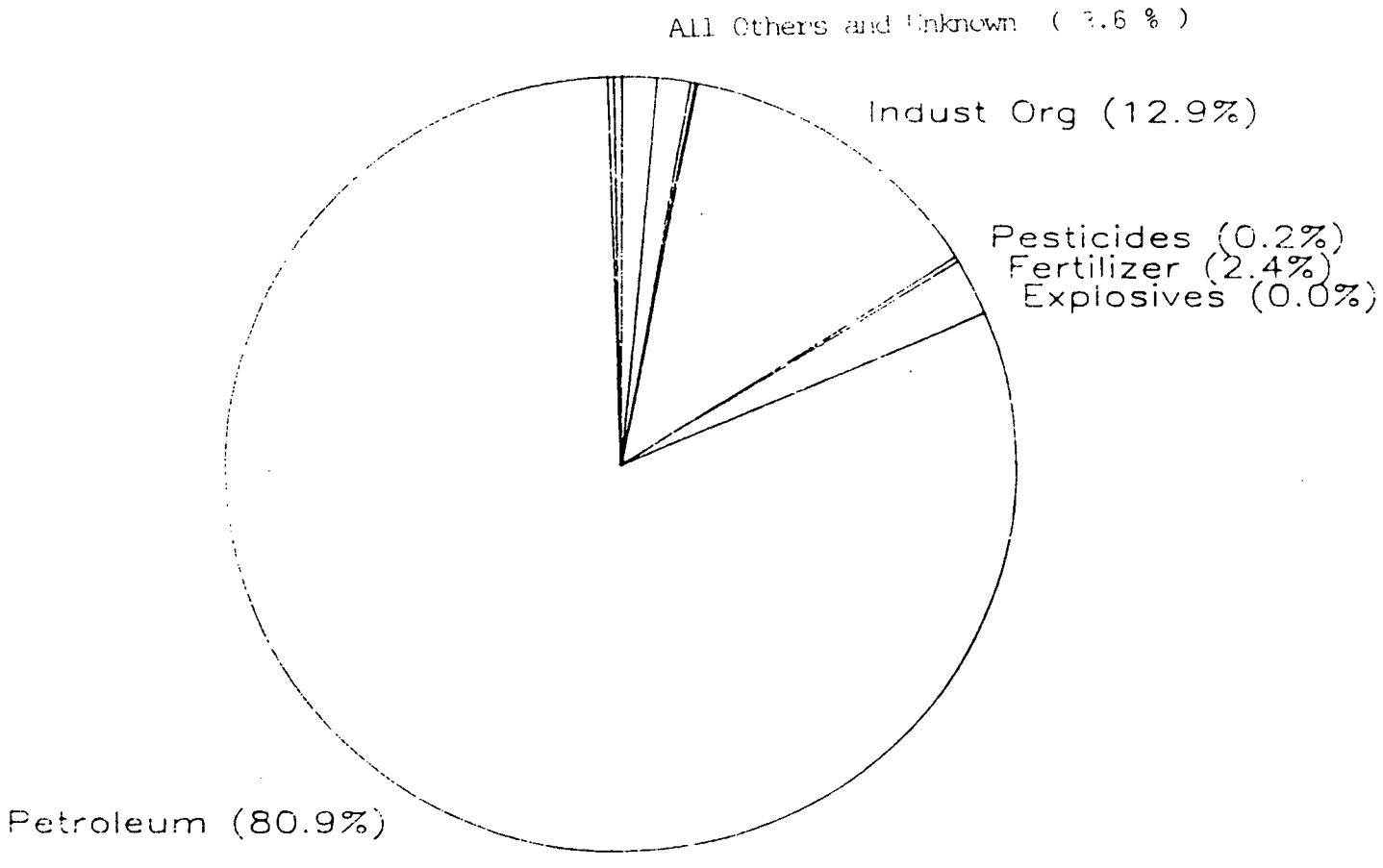


Exhibit 32

# DISTRIBUTION OF EVENTS WITH INJURIES

By SIC Group of Substance Released

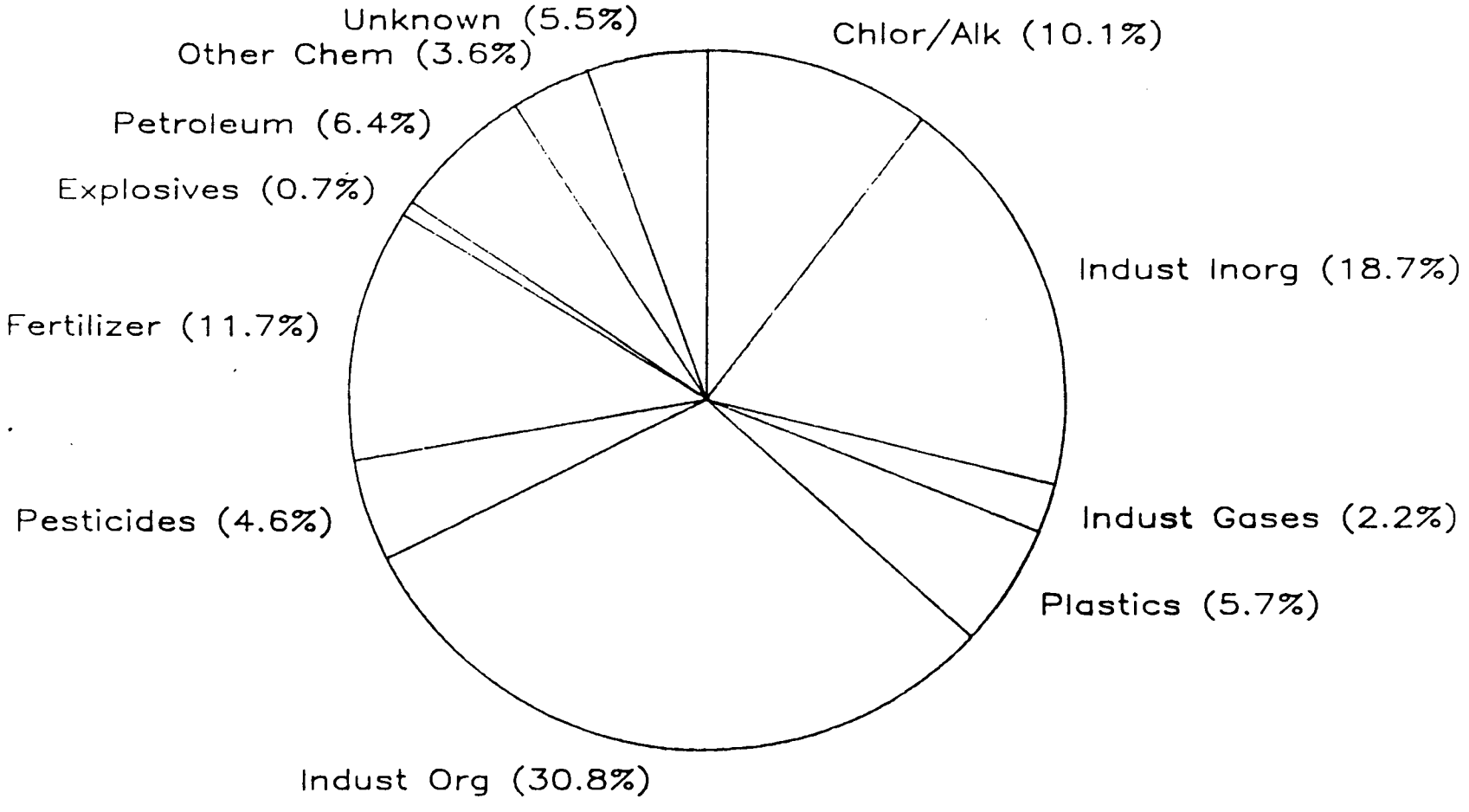


Exhibit 33

# DISTRIBUTION OF NUMBER OF INJURIES

By SIC Group of Substance Released

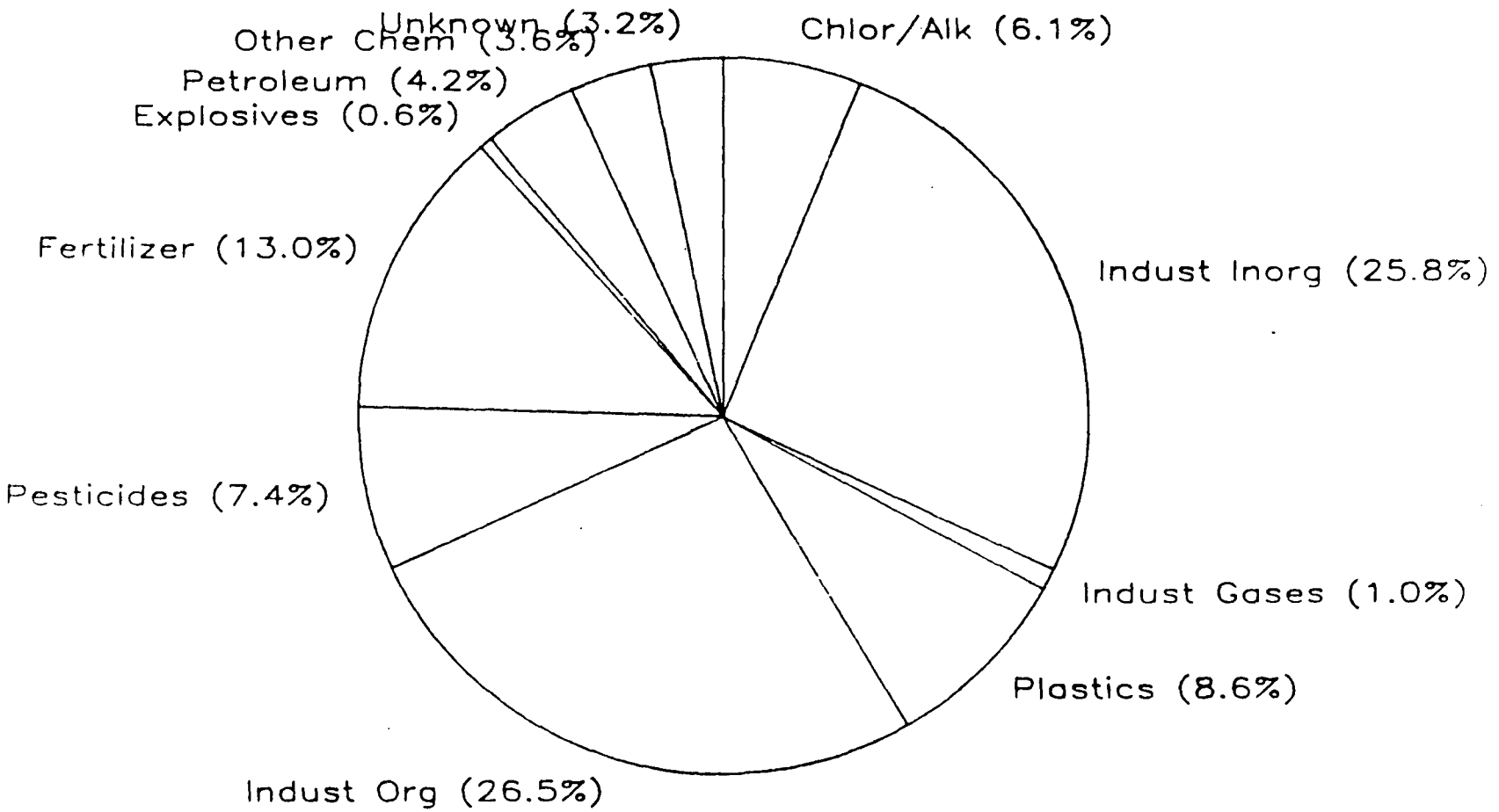


Exhibit 34

# DISTRIBUTION OF EVENTS WITH FATALITIES

By SIC Group of Substance Released

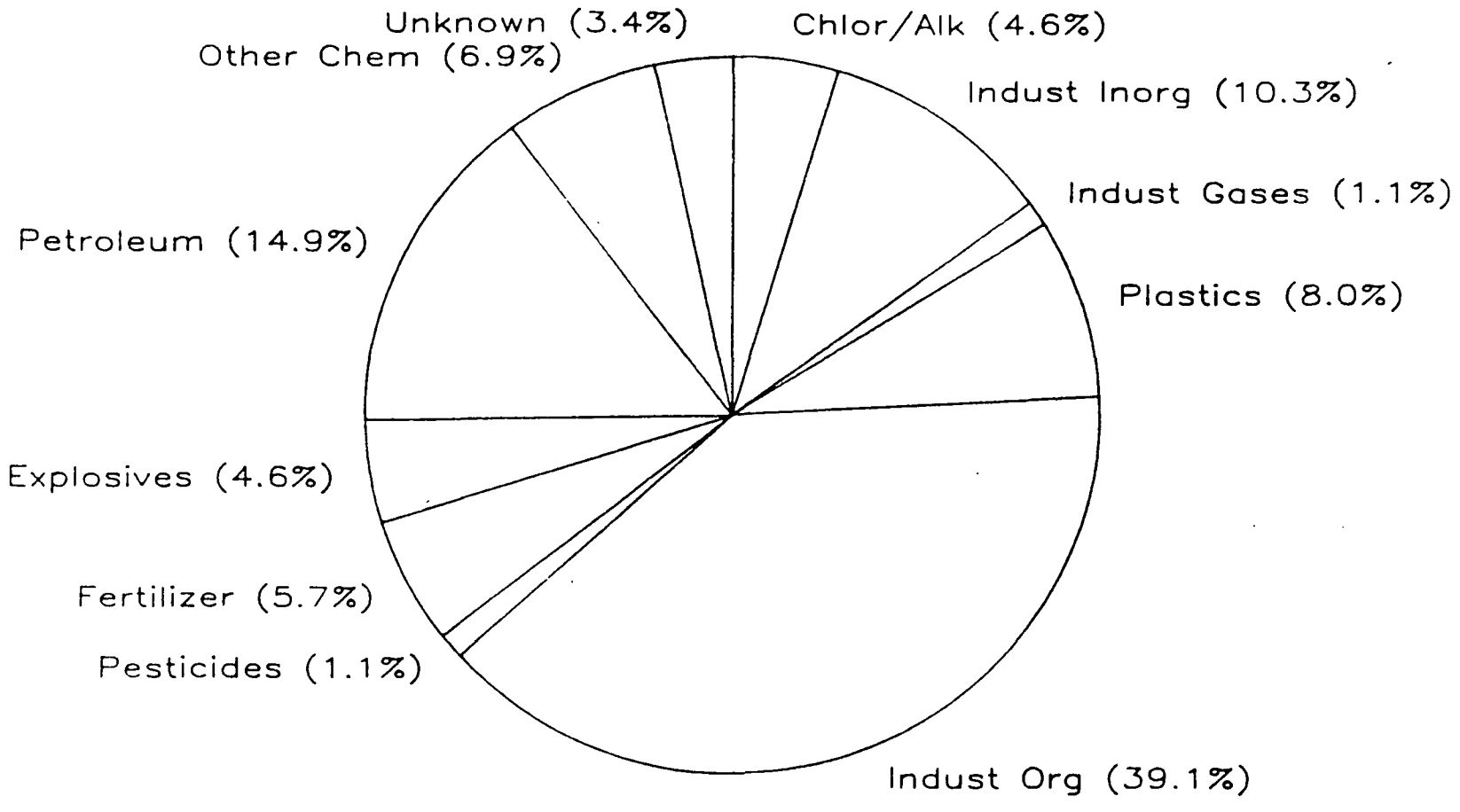
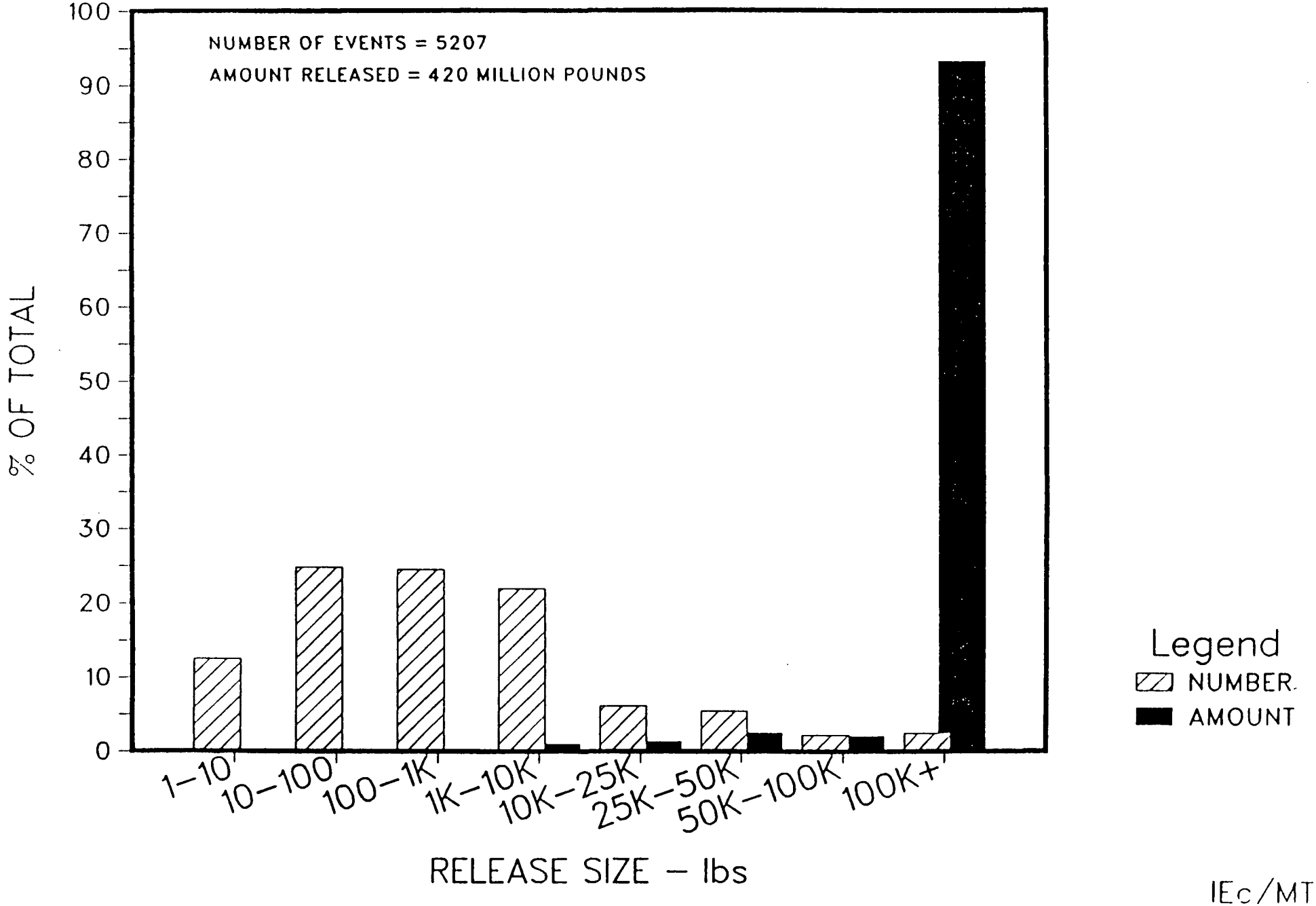


Exhibit 35

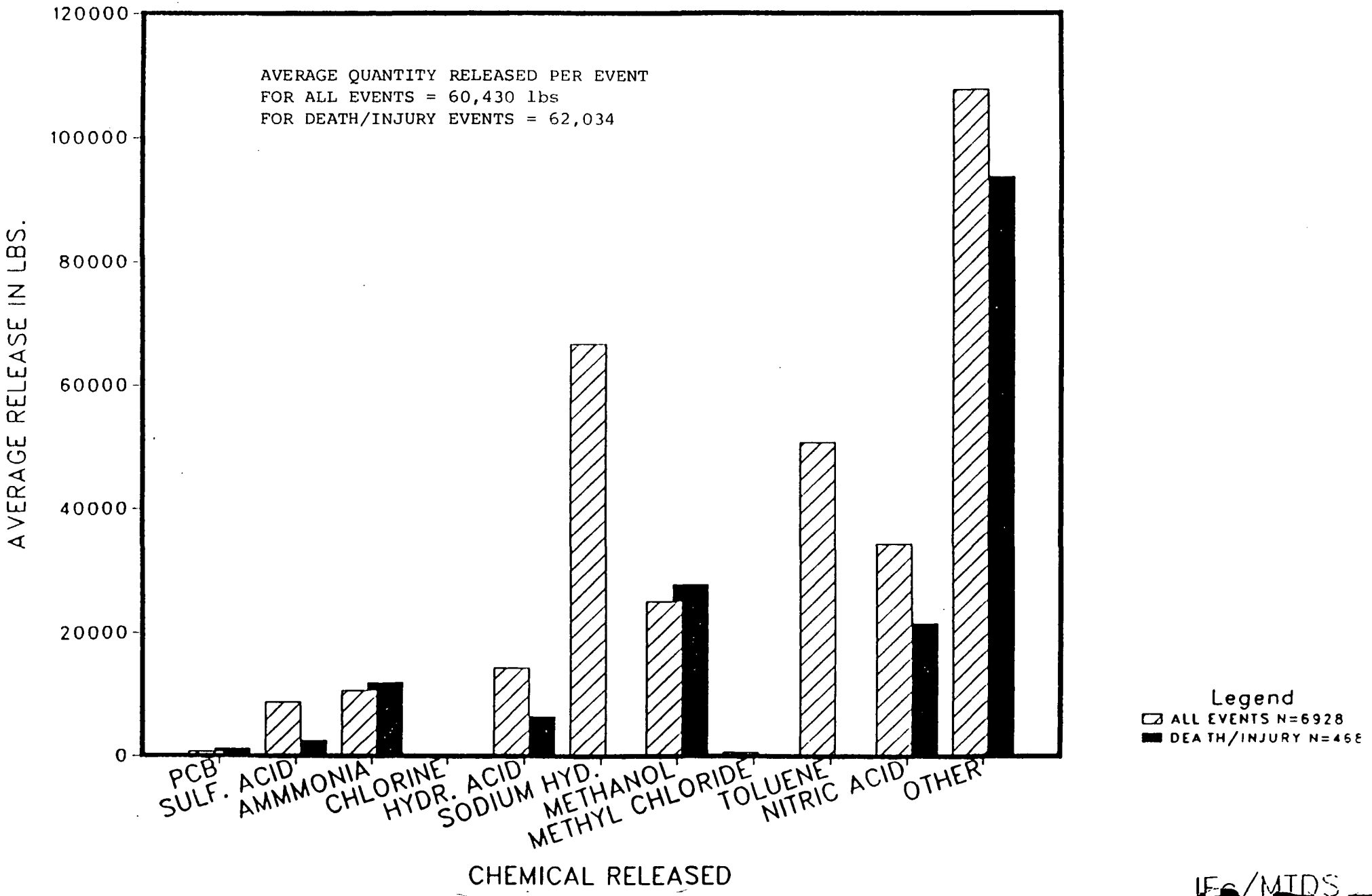
# ACUTE HAZARDOUS EVENTS DATABASE FREQUENCY DISTRIBUTION BY RELEASE SIZE FOR ALL EVENTS




IEc/MTD

Exhibit 36

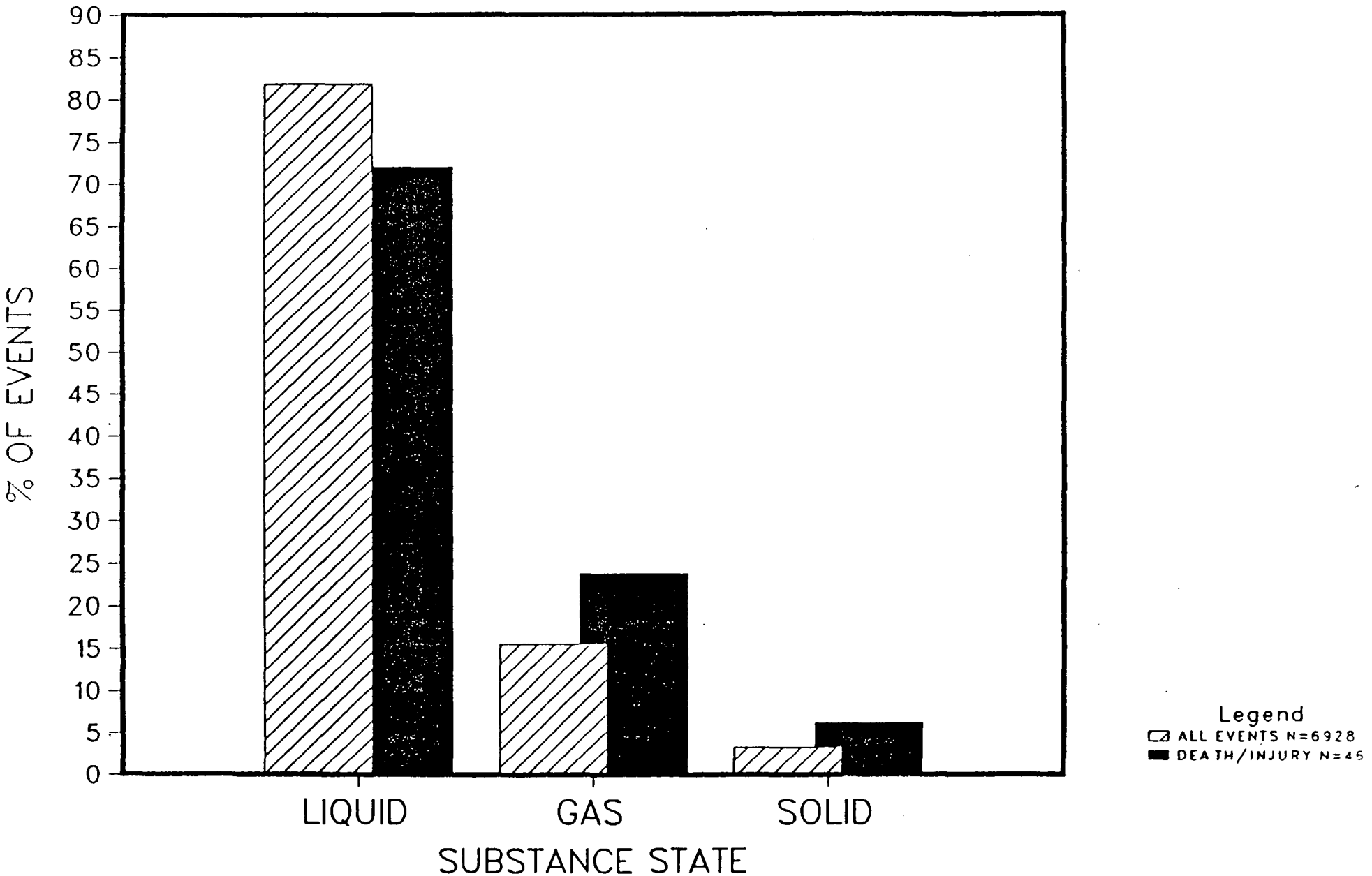
# ACUTE HAZARDOUS EVENTS DATABASE
# AVERAGE QUANTITY RELEASED PER EVENT




IEc/MTDS [redacted]

Exhibit 37

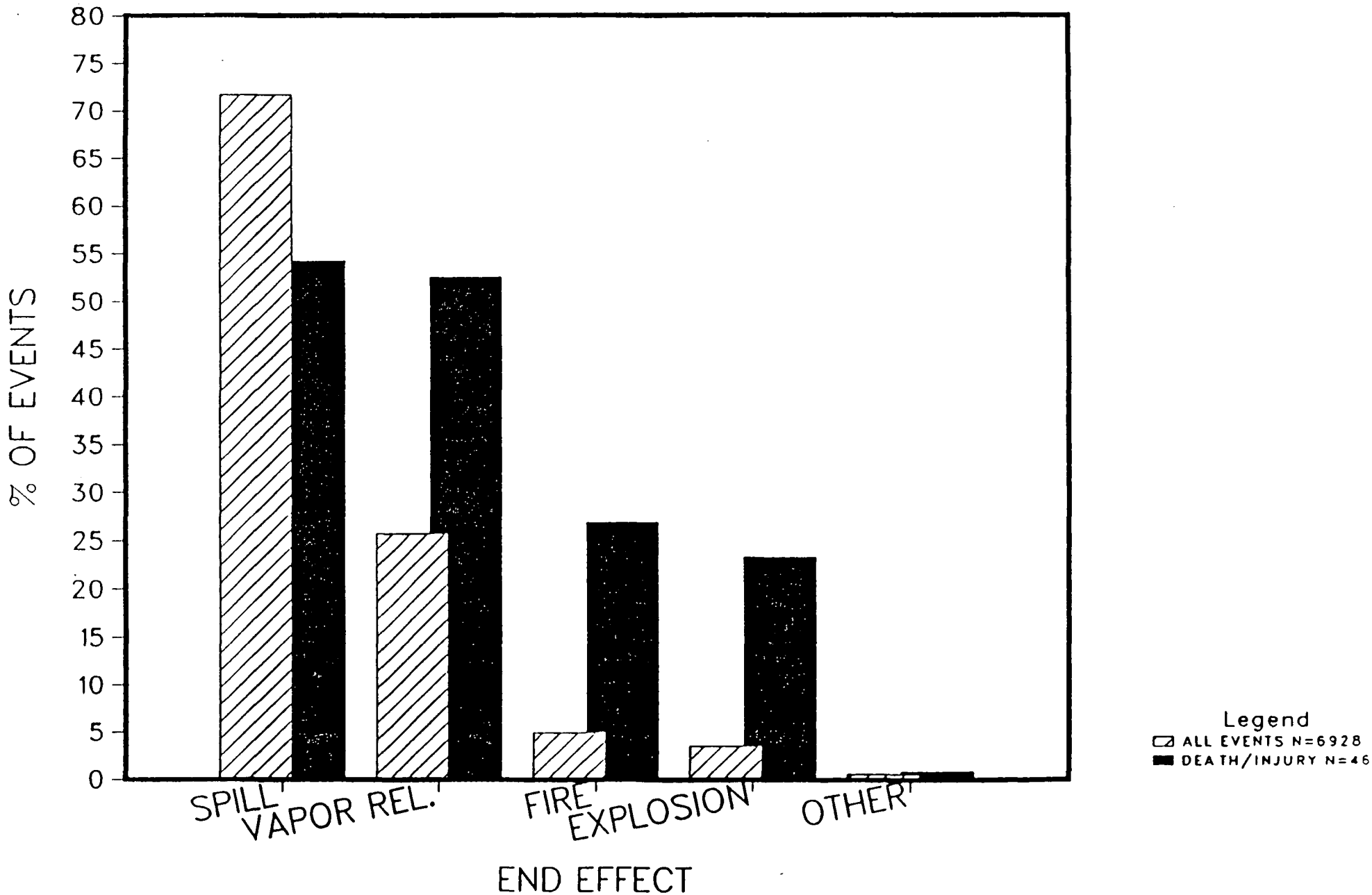
# ACUTE HAZARDOUS EVENTS DATABASE
## STATE OF SUBSTANCES RELEASED




IEc/MTDS

Exhibit 38

# ACUTE HAZARDOUS EVENTS DATABASE
# FREQUENCY OF REPORTED END EFFECTS



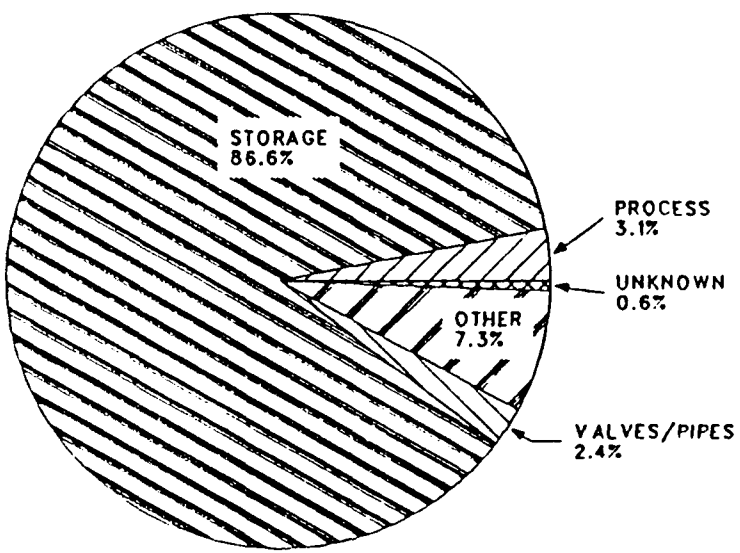

IEc/MIDS

Exhibit 39

# ACUTE HAZARDOUS EVENTS DATABASE

## IN-PLANT EVENTS BY LOCATION

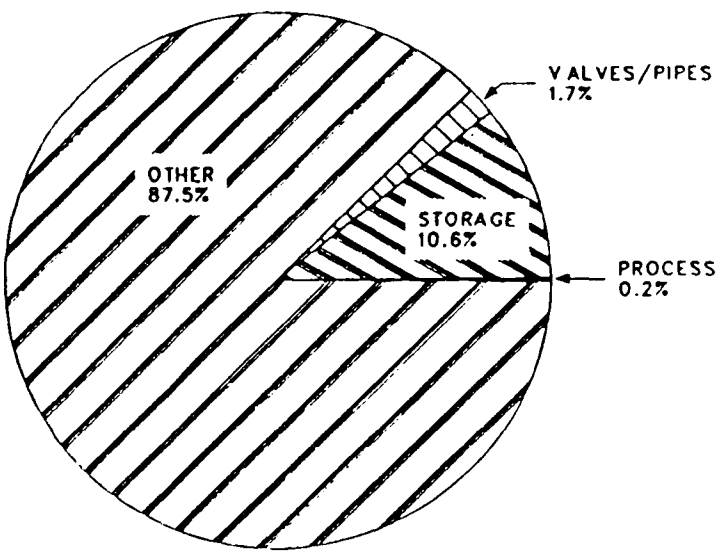
*TOTAL AMOUNT RELEASED*




NUMBER OF EVENTS = 5179

## IN-PLANT EVENTS BY LOCATION

*AMOUNT RELEASED IN DEATH/INJURY EVENTS*




NUMBER OF EVENTS = 304

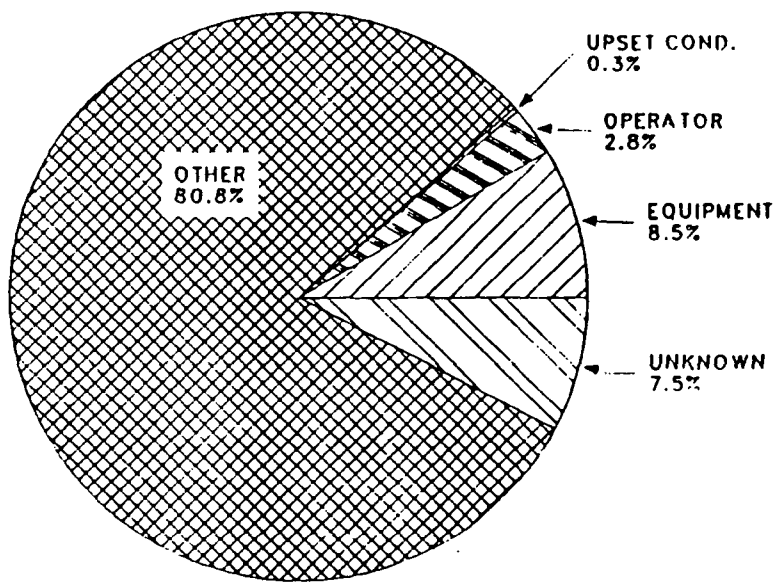
IEc/MTD

Exhibit 40

# ACUTE HAZARDOUS EVENTS DATABASE

## IN-PLANT EVENTS BY CAUSE

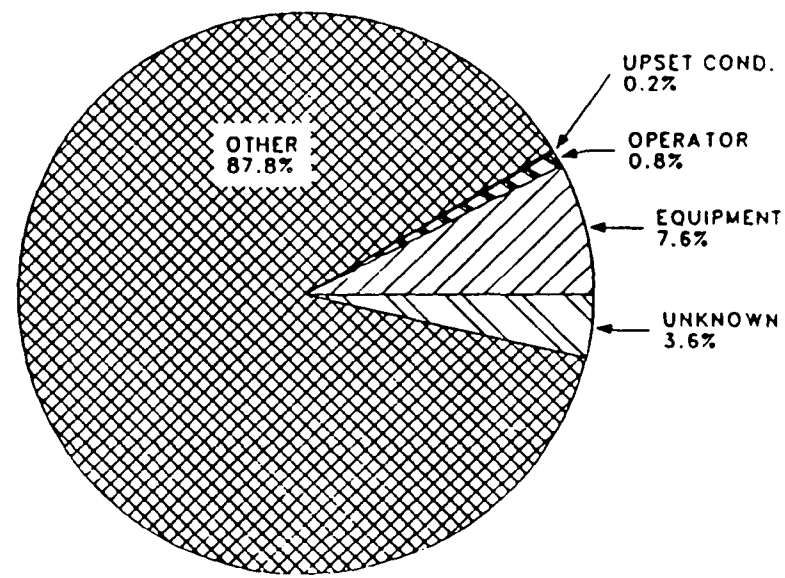
*TOTAL AMOUNT RELEASED*




NUMBER OF EVENTS = 5179

## IN-PLANT EVENTS BY CAUSE

*AMOUNT RELEASED IN DEATH/INJURY EVENTS*

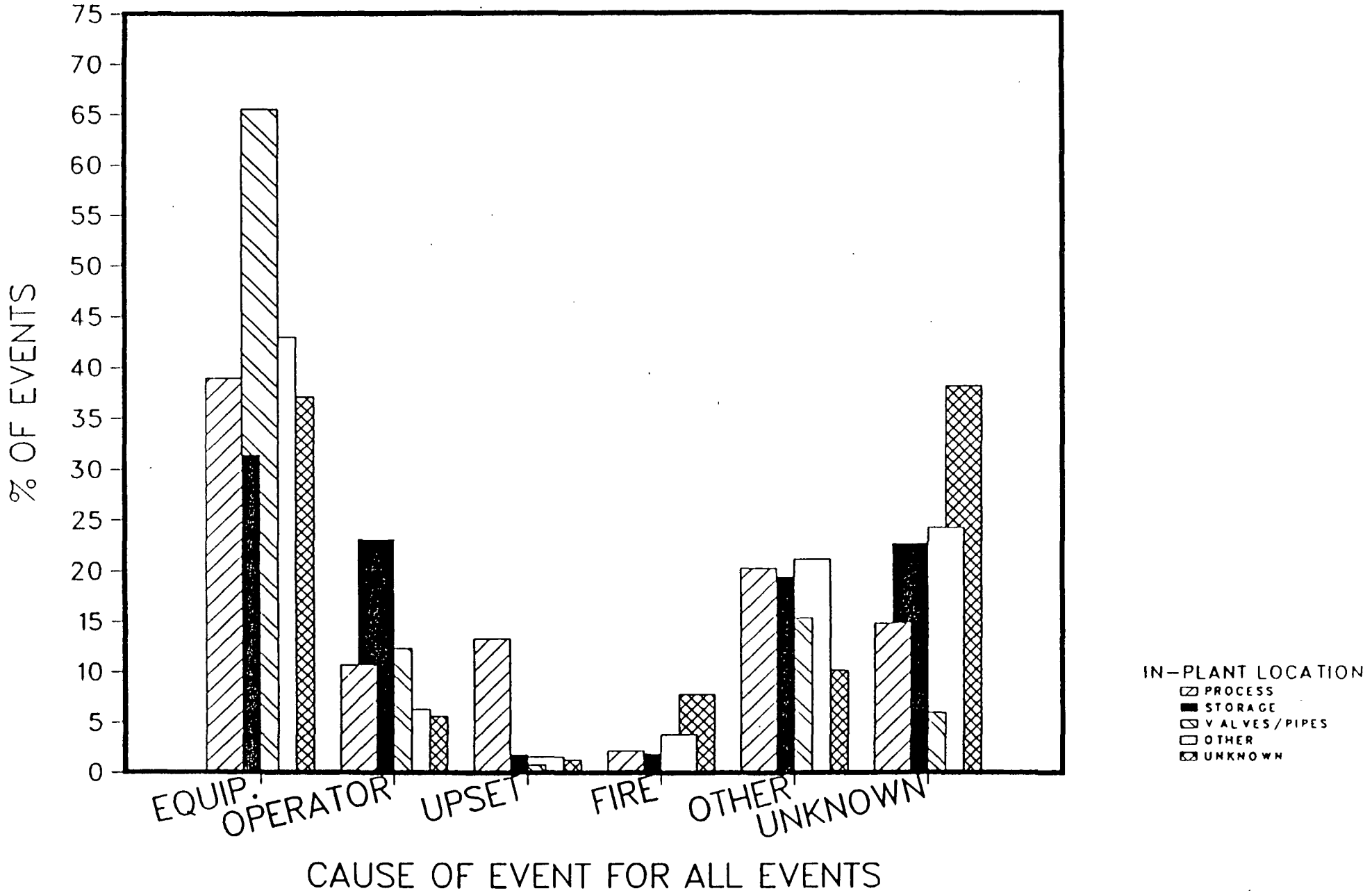



NUMBER OF EVENTS = 304

IEc/MTD

[redacted]

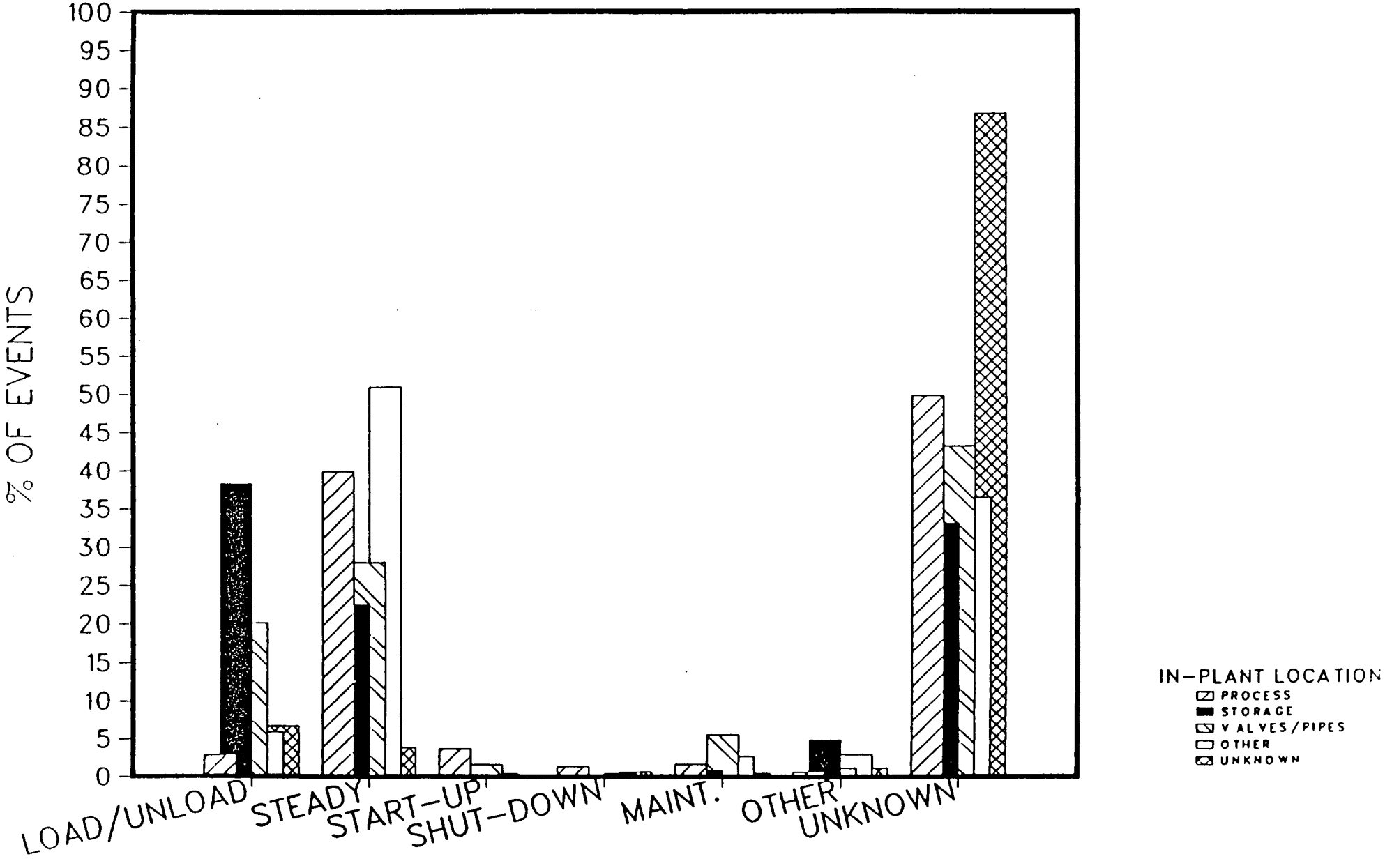
# ACUTE HAZARDOUS EVENTS DATABASE
# IN–PLANT EVENTS BY CAUSE AND LOCATION




IEc/MTDS

Exhibit 42

# ACUTE HAZARDOUS EVENTS DATABASE
# IN-PLANT EVENTS BY CONFIGURATION AND LOCATION

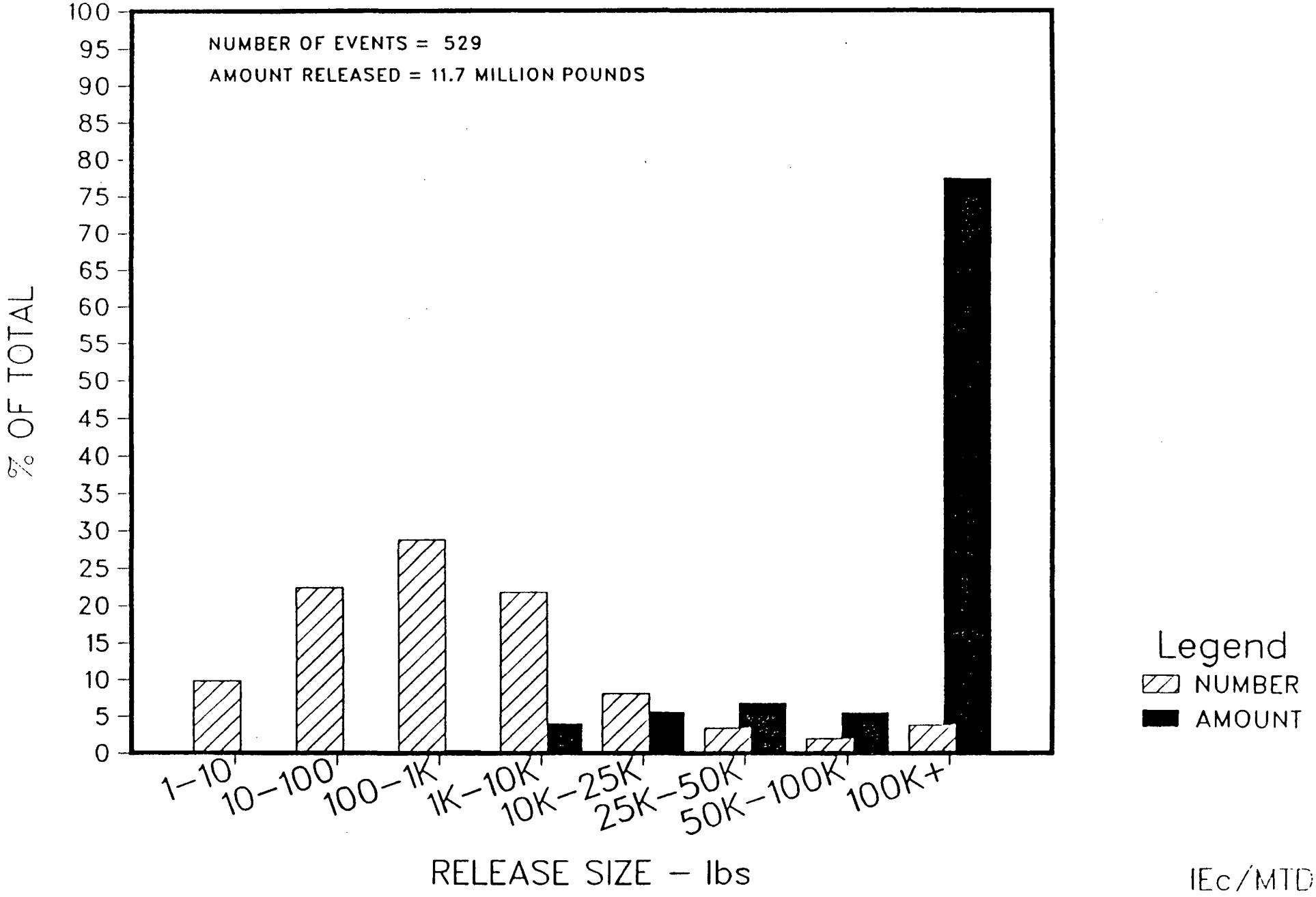



PLANT CONFIGURATION FOR ALL EVENTS

IEc/MTDS

Exhibit A2

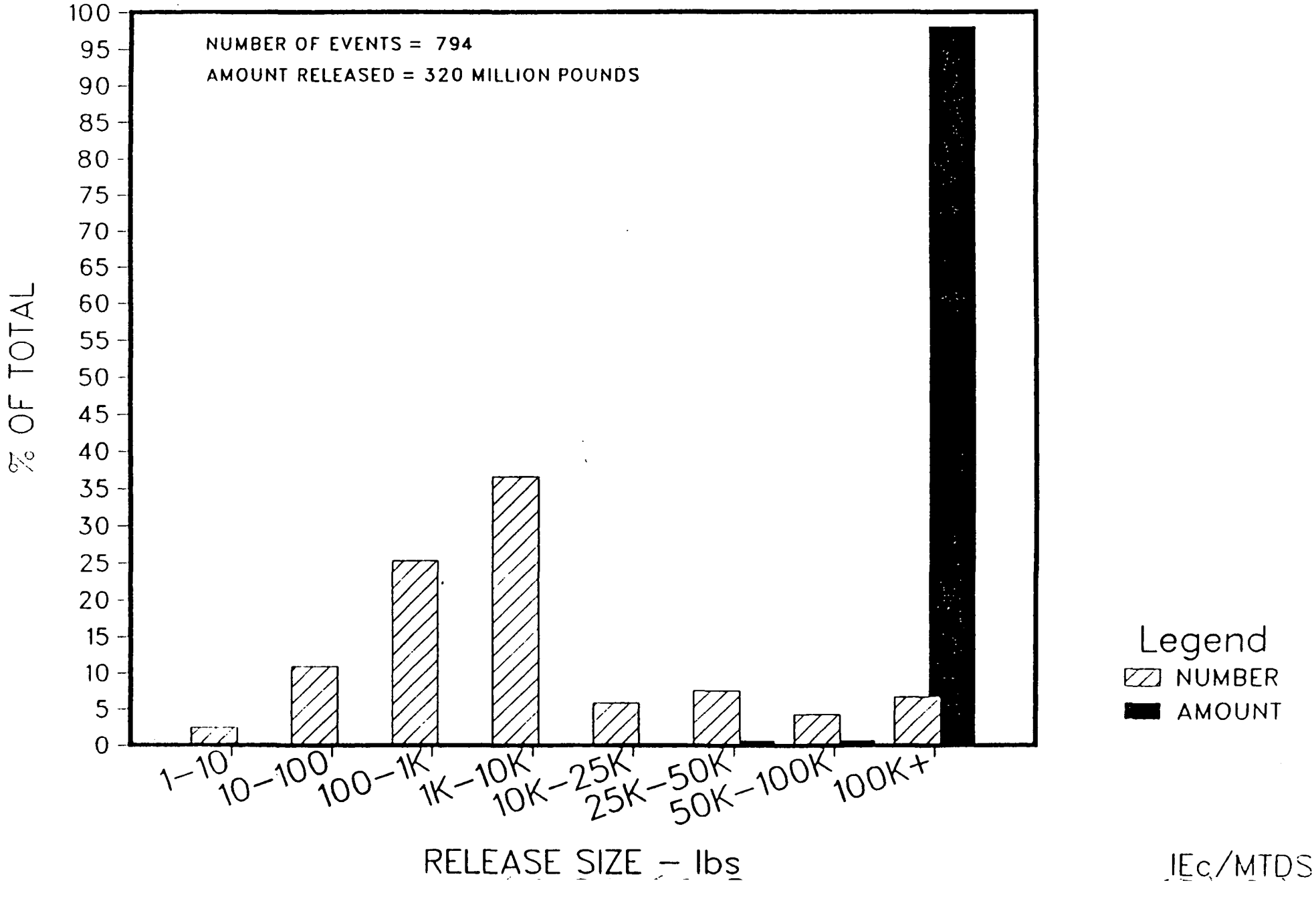
# ACUTE HAZARDOUS EVENTS DATABASE
## DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT LOCATIONS
## EVENTS INVOLVING PROCESS VESSELS




IEc/MTDS

Exhibit 44

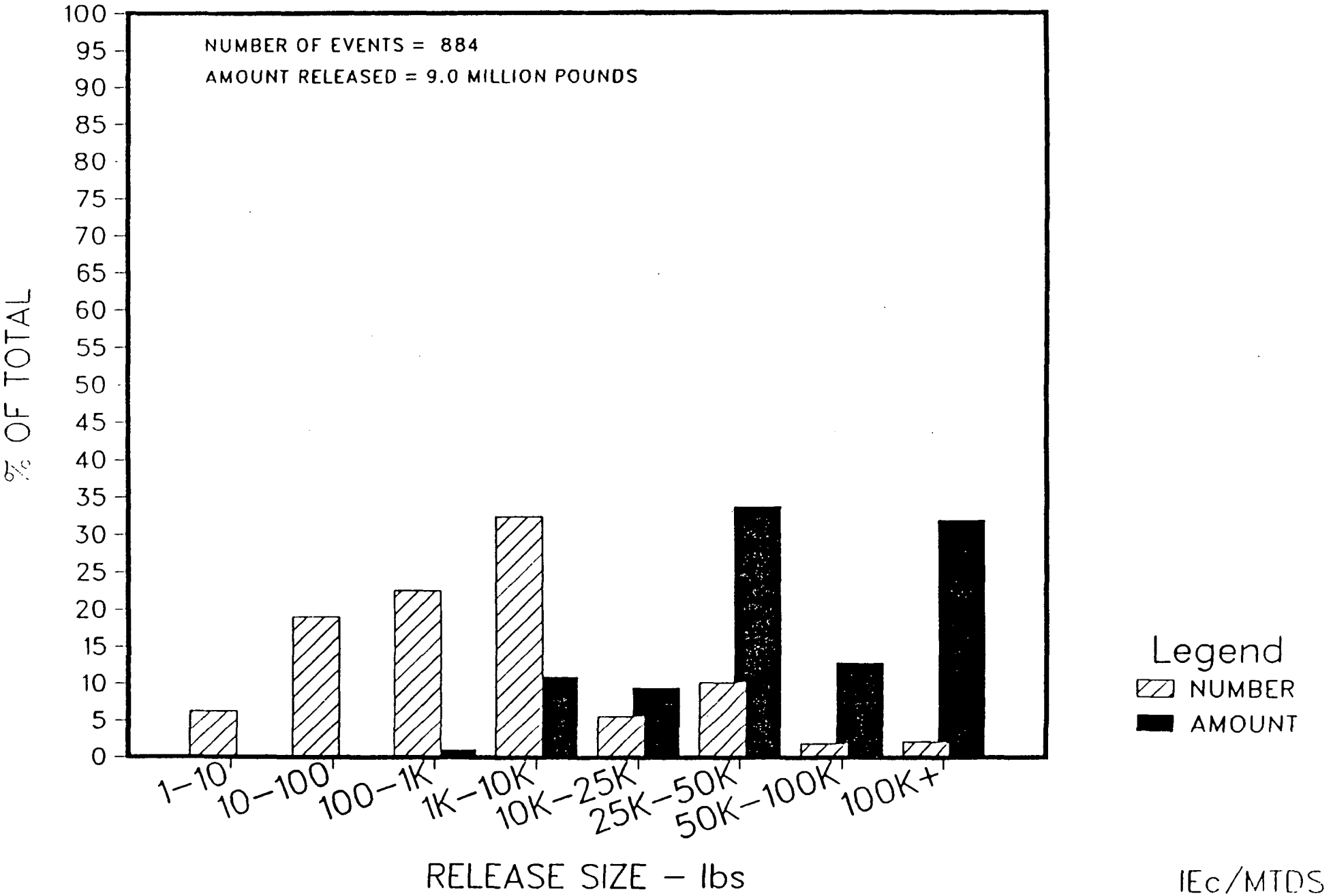
# ACUTE HAZARDOUS EVENTS DATABASE
## DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT LOCATIONS
## EVENTS INVOLVING STORAGE VESSELS




IEc/MTDS

Exhibit 45

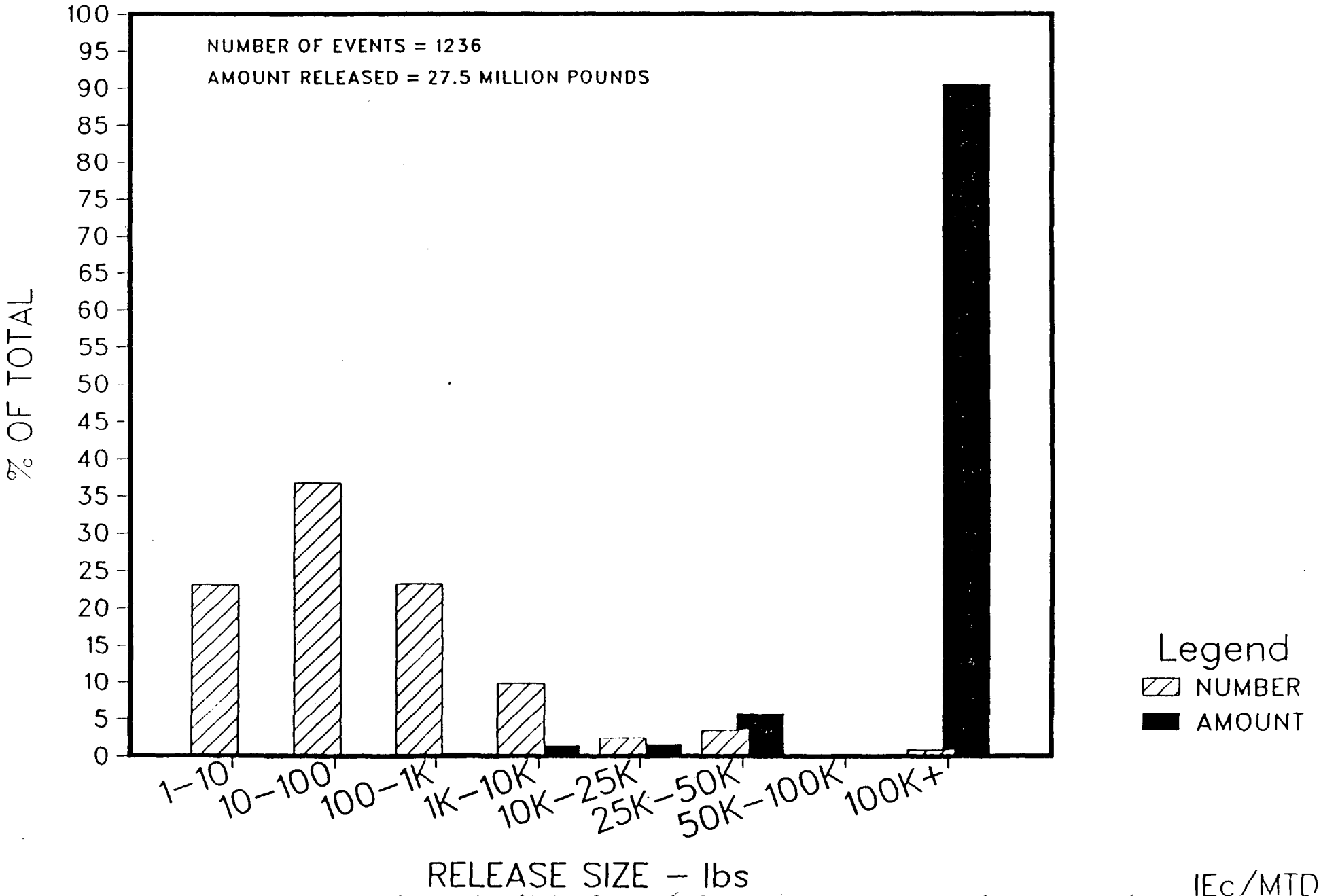
# ACUTE HAZARDOUS EVENTS DATABASE
## DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT LOCATIONS
## EVENTS INVOLVING VALVES/PIPES




IEc/MTDS

Exhibit 46

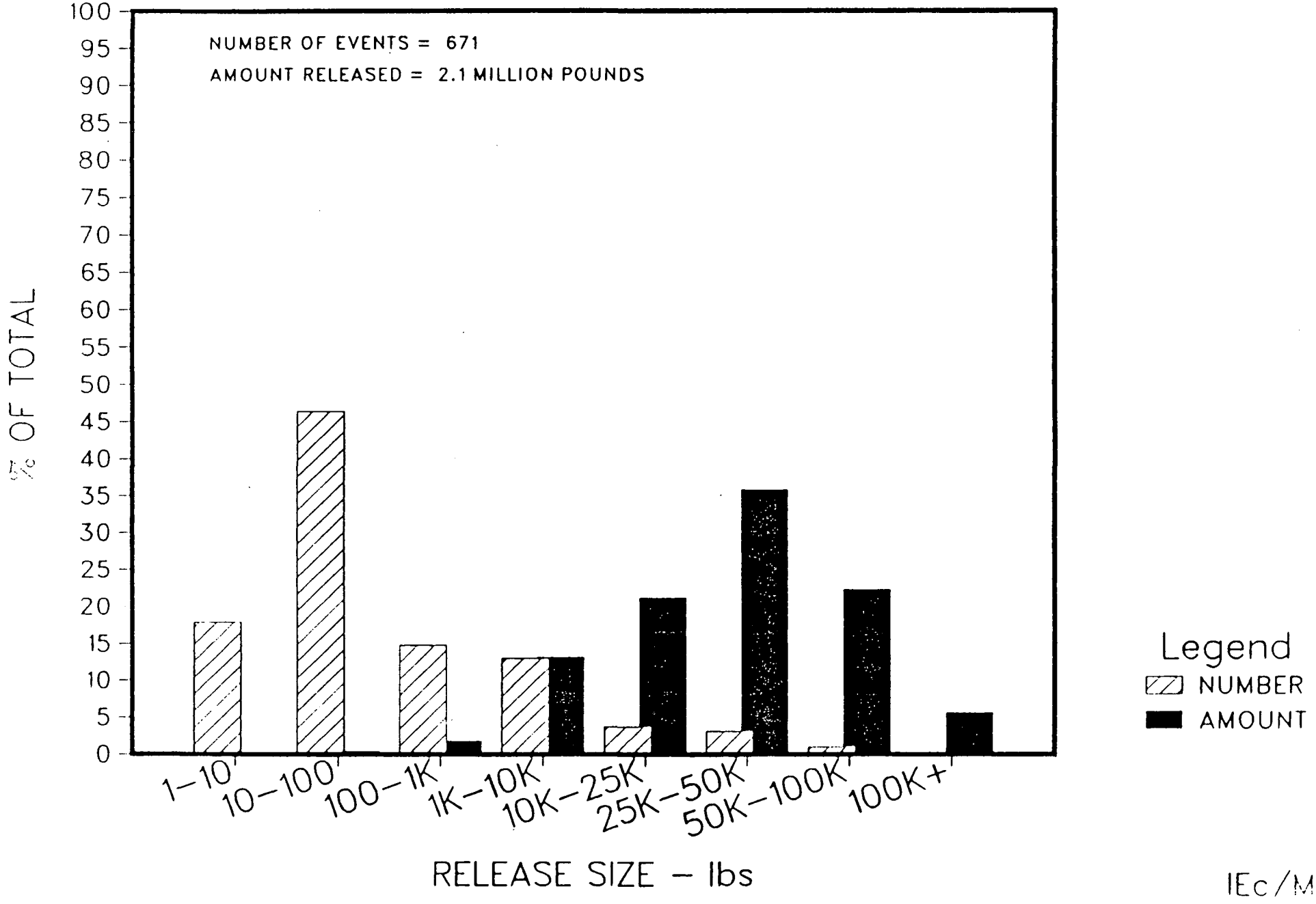
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT LOCATIONS INVOLVING OTHER LOCATIONS




IEc/MTDS

E[redacted]it [redacted]

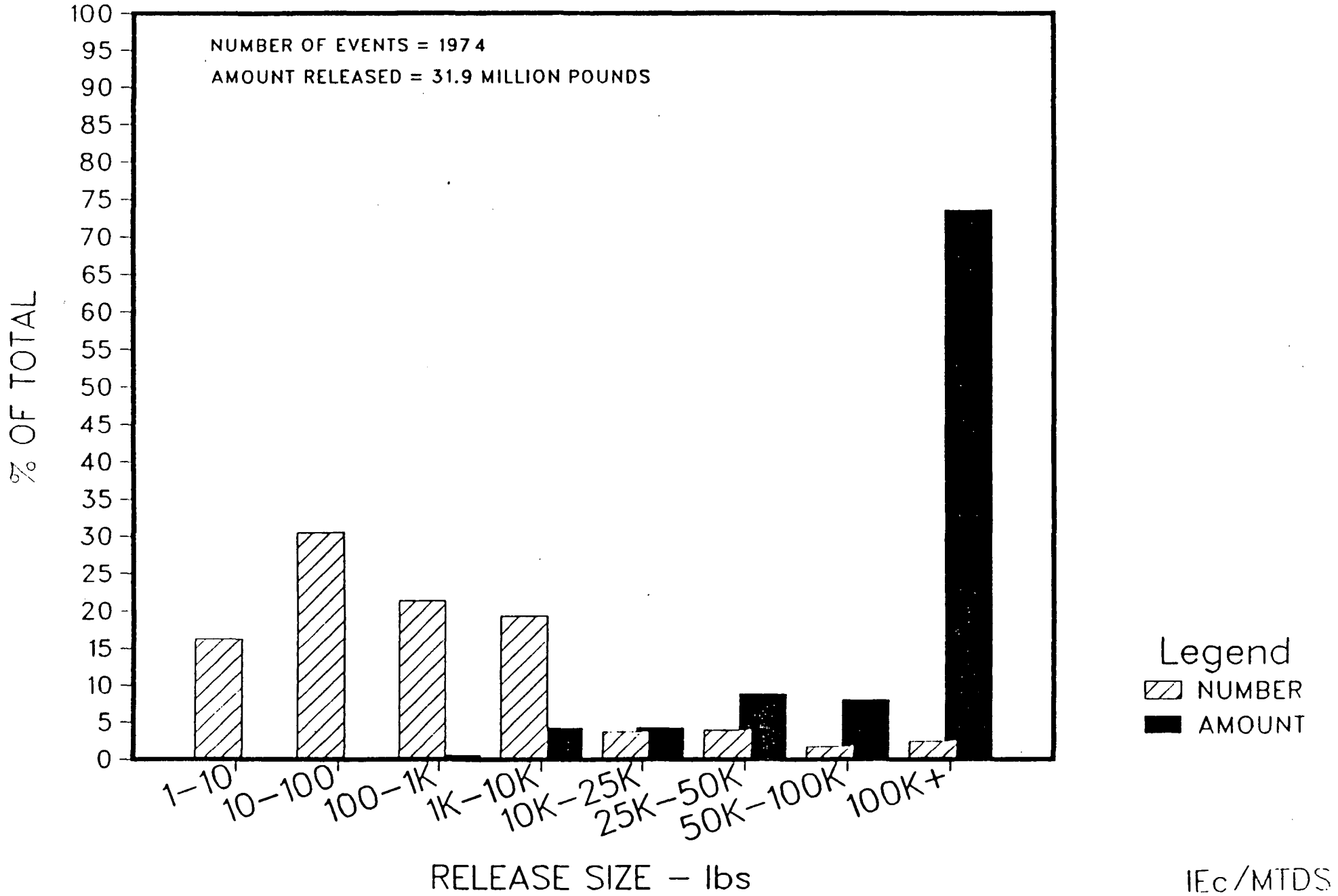
# ACUTE HAZARDOUS EVENTS DATABASE
# DISTRIBUTION BY RELEASE SIZE FOR IN–PLANT LOCATIONS
# EVENTS INVOLVING UNKNOWN LOCATION




IEc/MT[illegible]

Exhibit 48

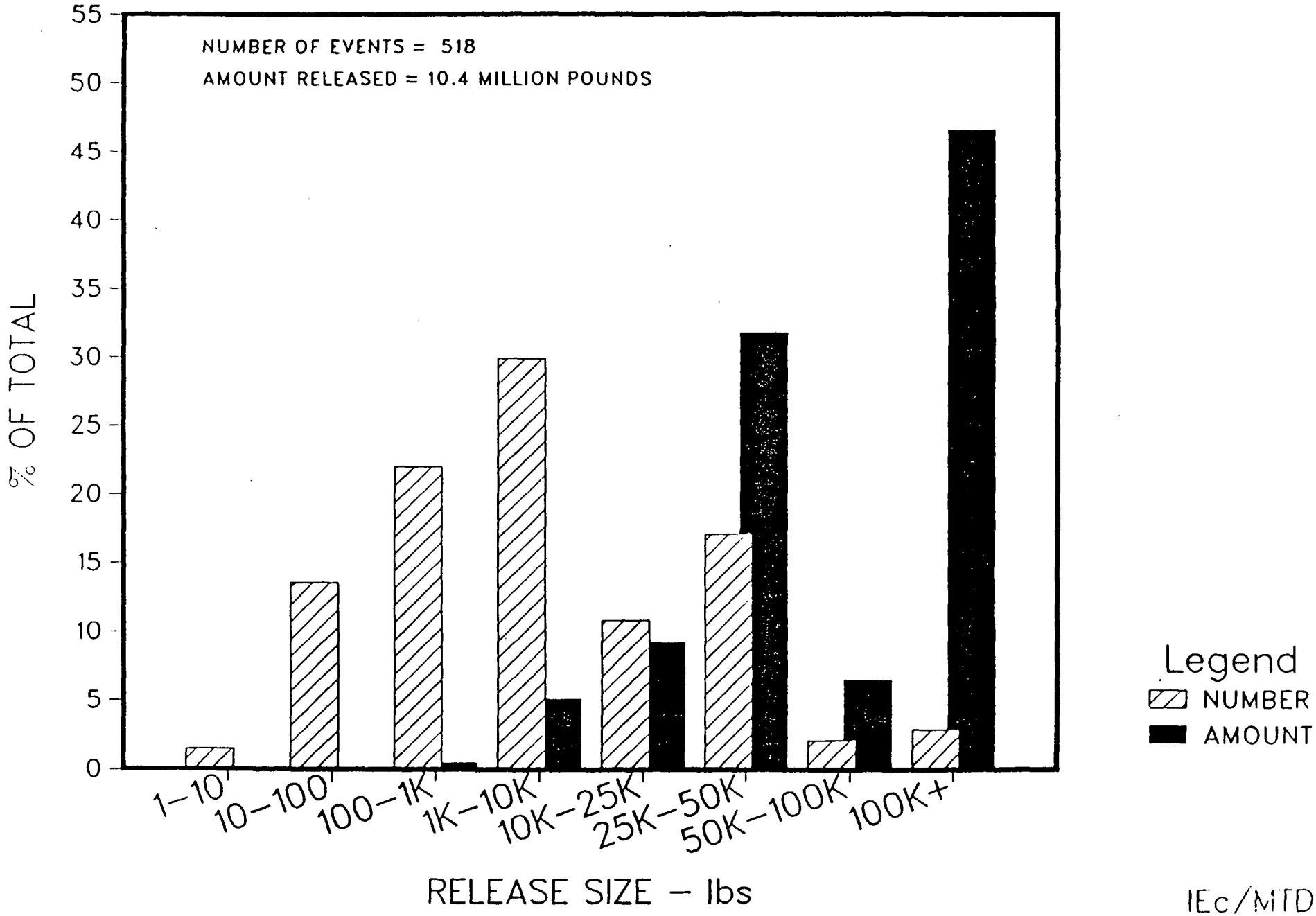
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT EVENTS INVOLVING EQUIPMENT FAILURE AS CAUSE




IEc/MTDS

[redacted]Exh[redacted] 4[redacted] [redacted]

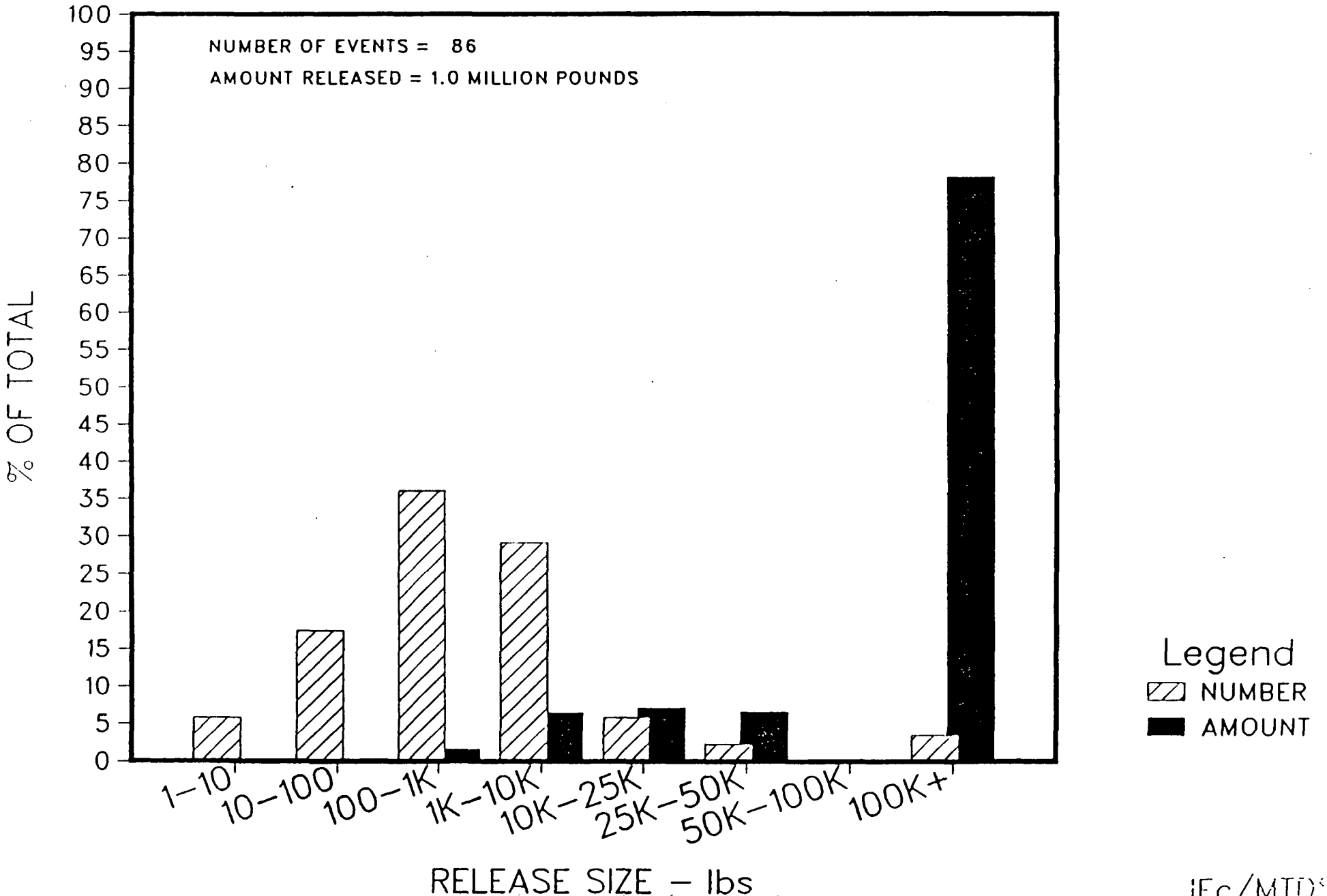
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT EVENTS INVOLVING OPERATOR ERROR AS CAUSE




IEc/MTDS

Exhibit 50

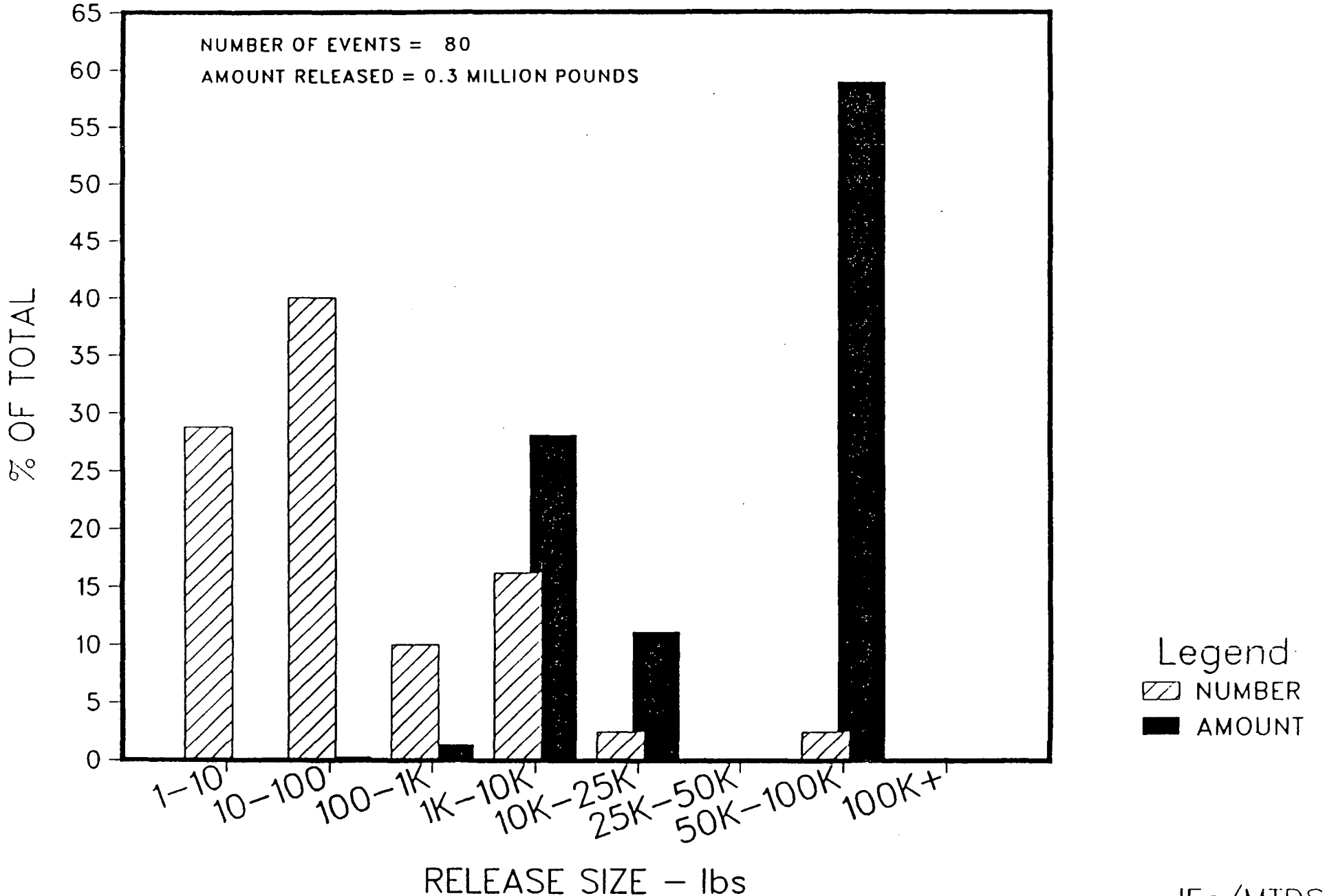
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT EVENTS INVOLVING UPSET CONDITIONS AS CAUSE




IEc/MTDS

Exhibit 51

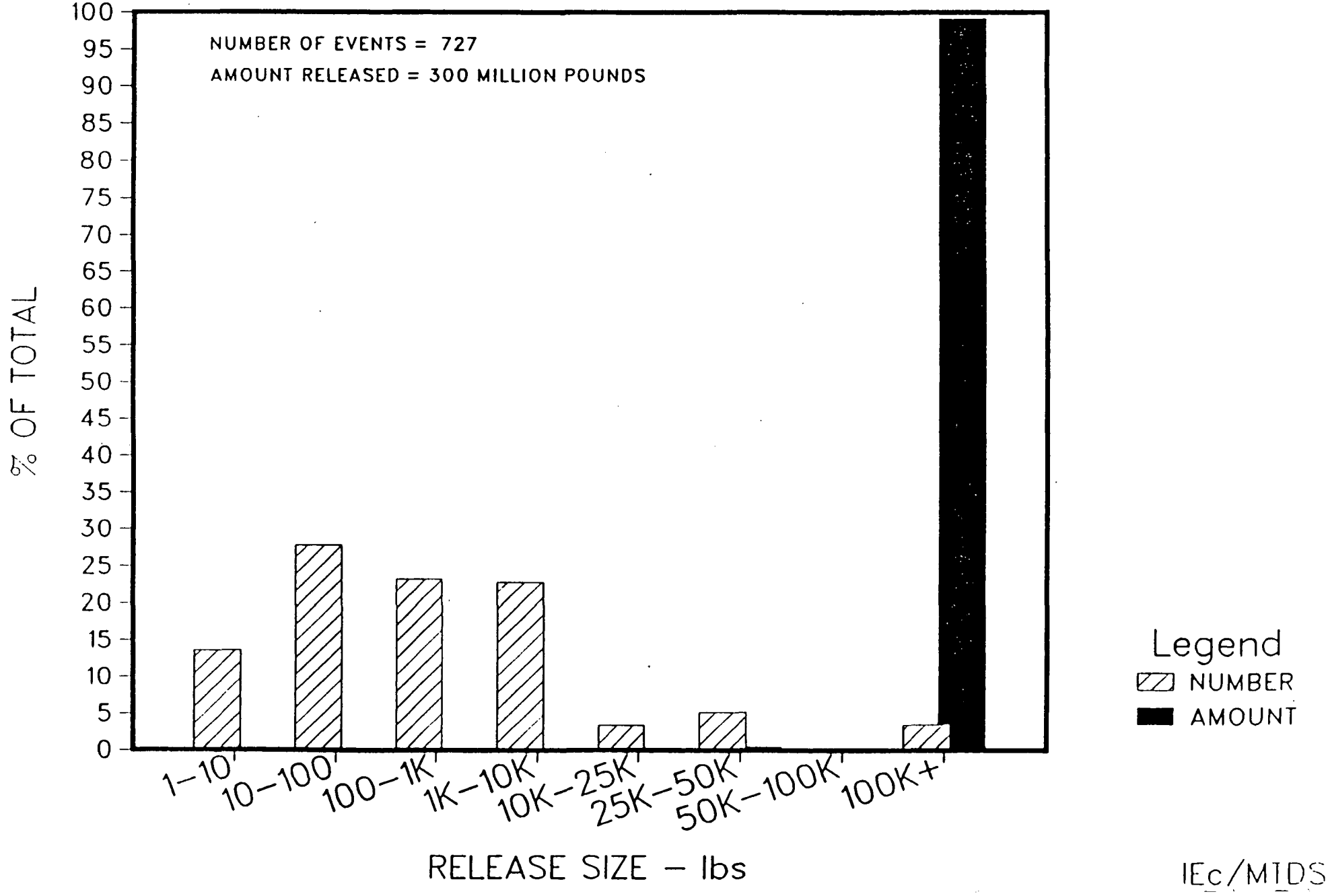
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT EVENTS INVOLVING FIRE AS CAUSE




IEc/MTDS

Exhibit 52

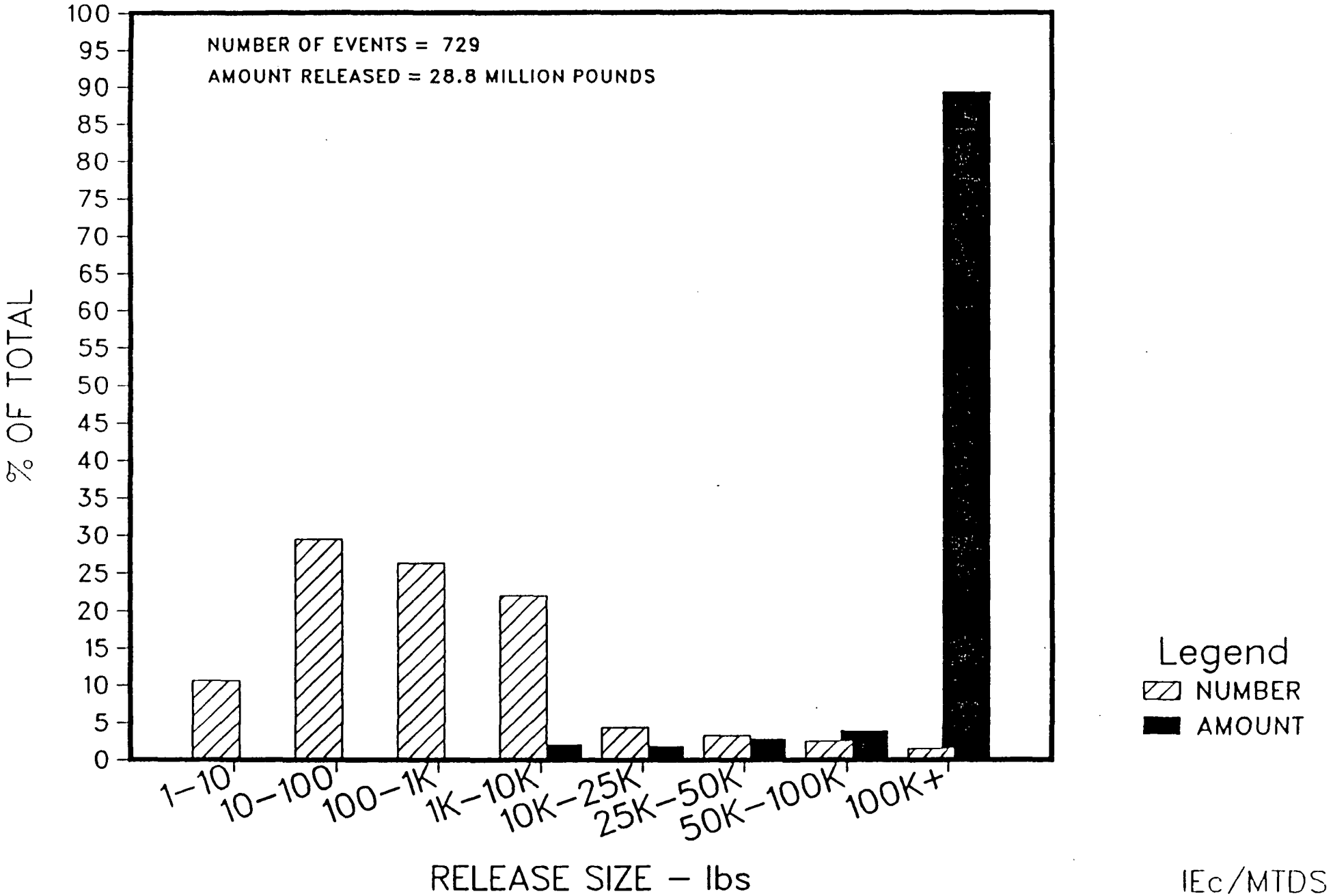
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT EVENTS INVOLVING OTHER CAUSES




IEc/MIDS

Exhibit 53

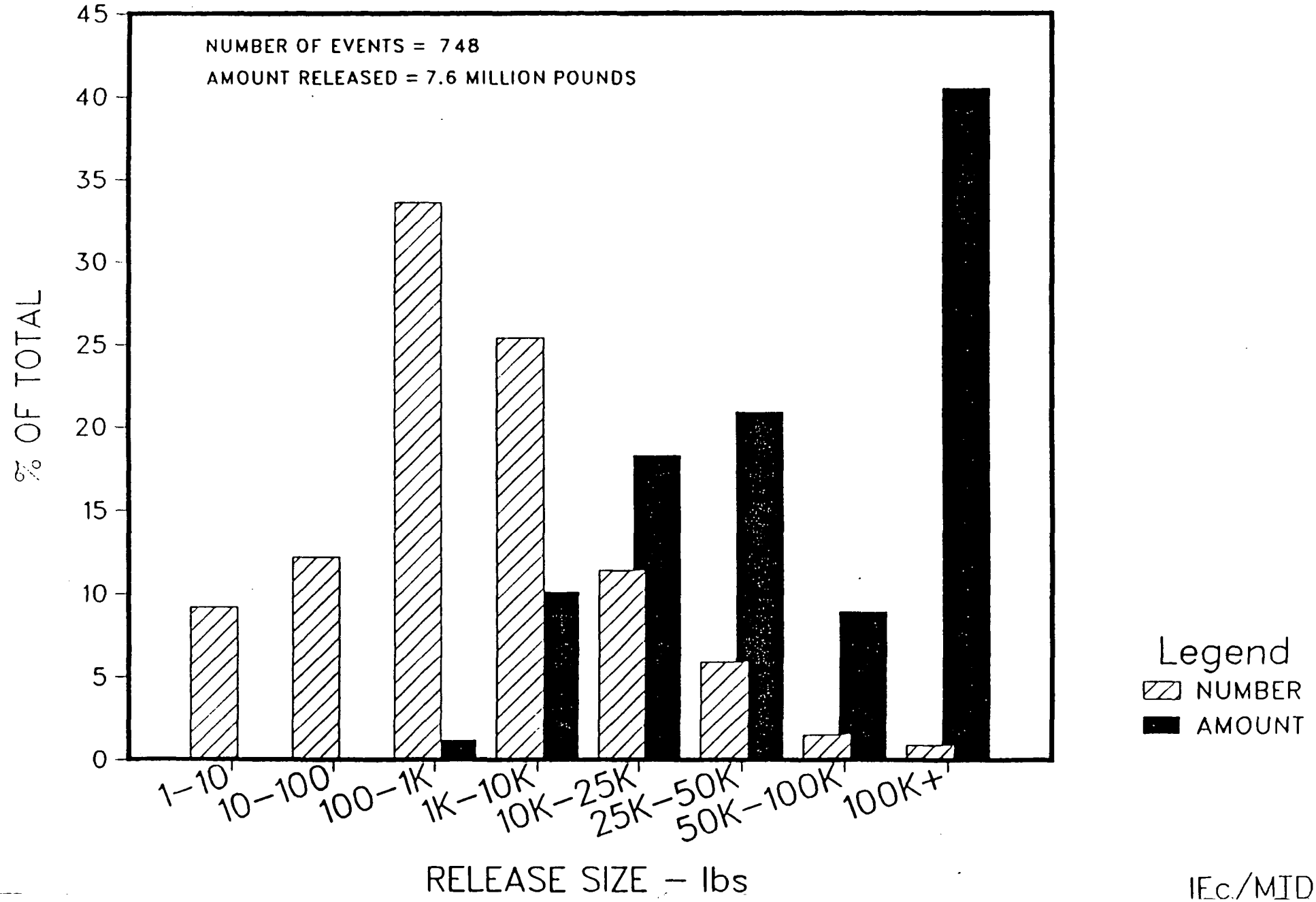
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-PLANT EVENTS INVOLVING UNKNOWN CAUSE




IEc/MTDS

Exhibit 54

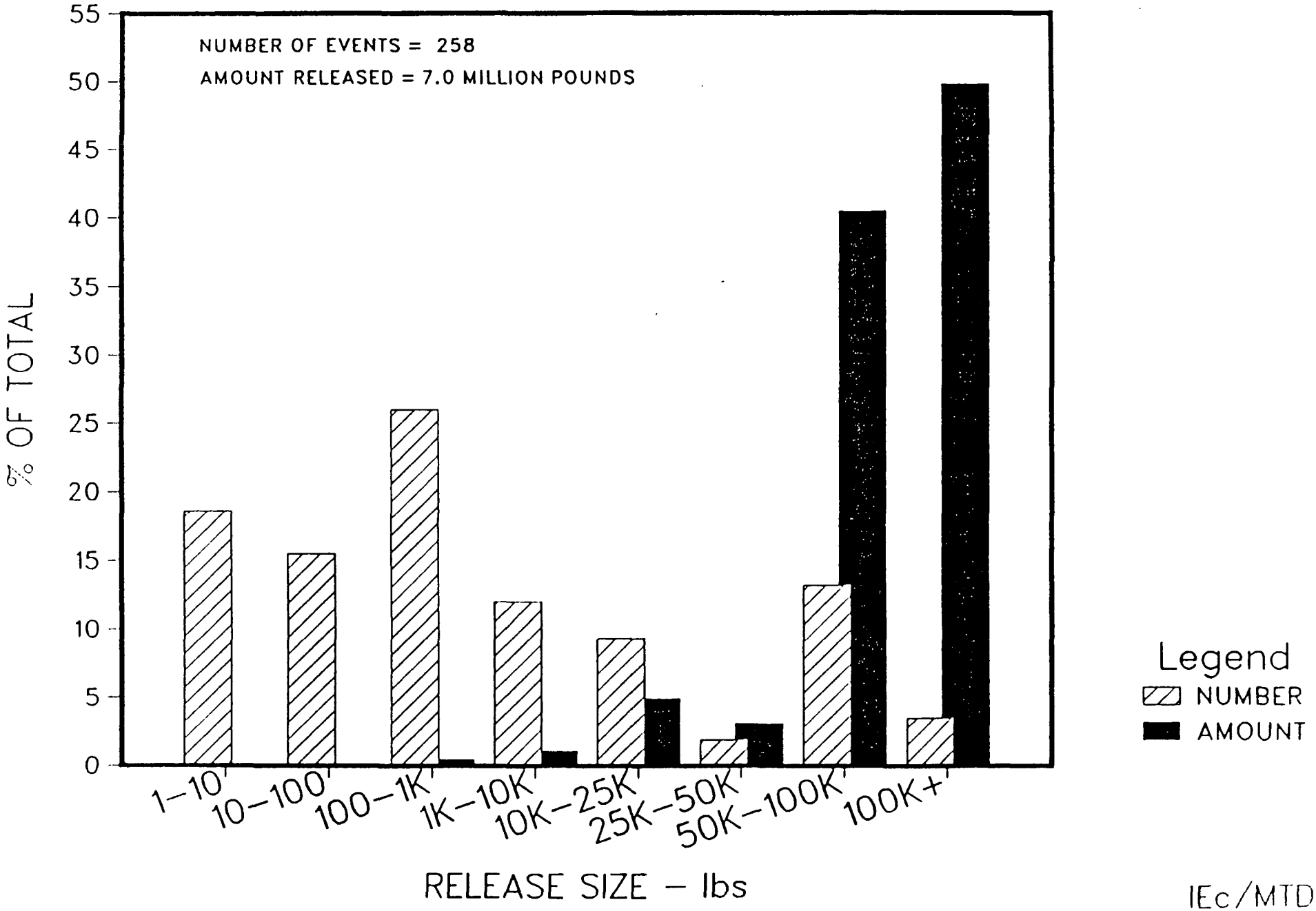
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-TRANSIT EVENTS INVOLVING TRUCKS




IEc/MIDS

Exhibit 55

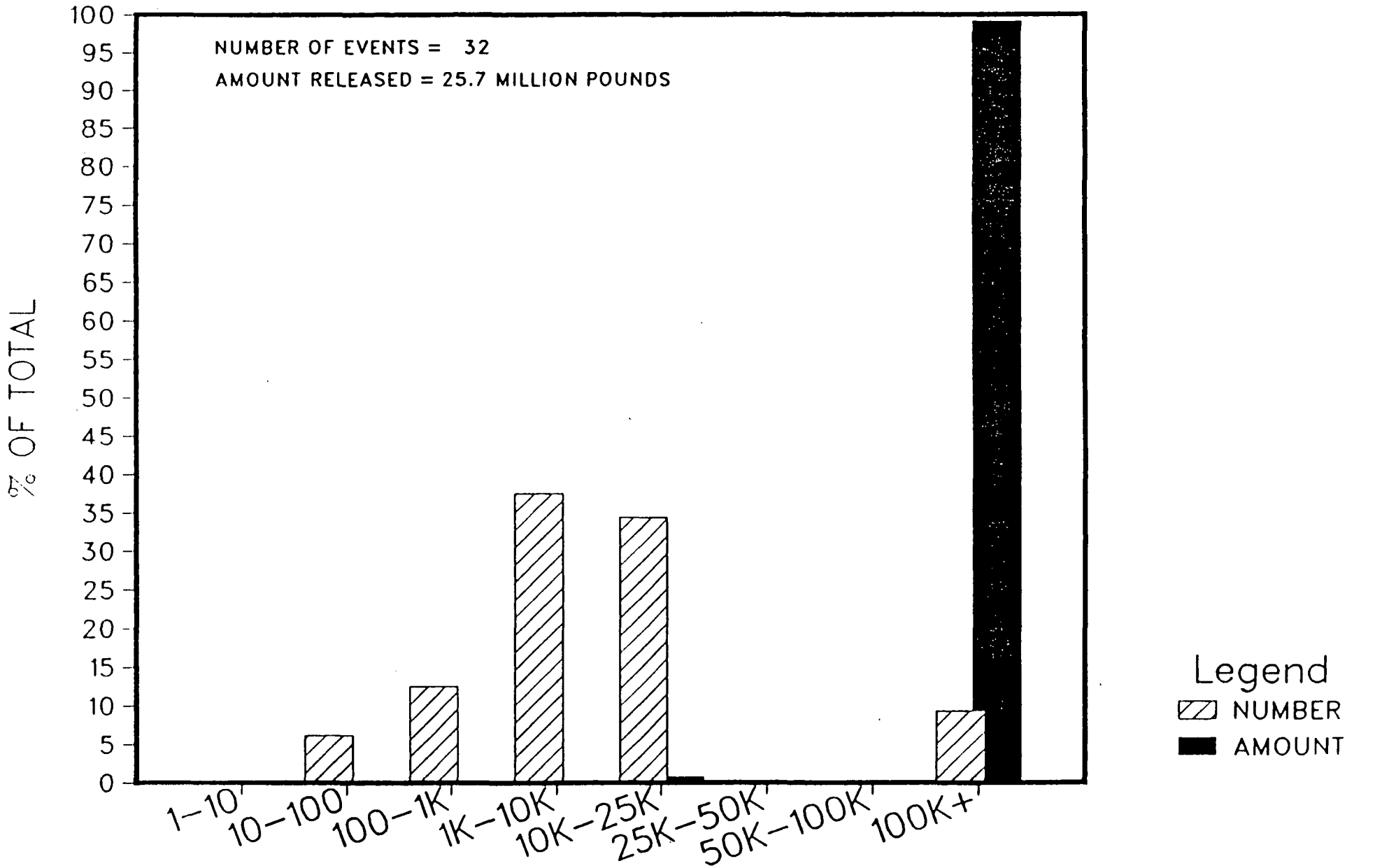
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN–TRANSIT EVENTS INVOLVING RAIL




IEc/MTDS

Exhibit 56

# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-TRANSIT EVENTS INVOLVING PIPELINE

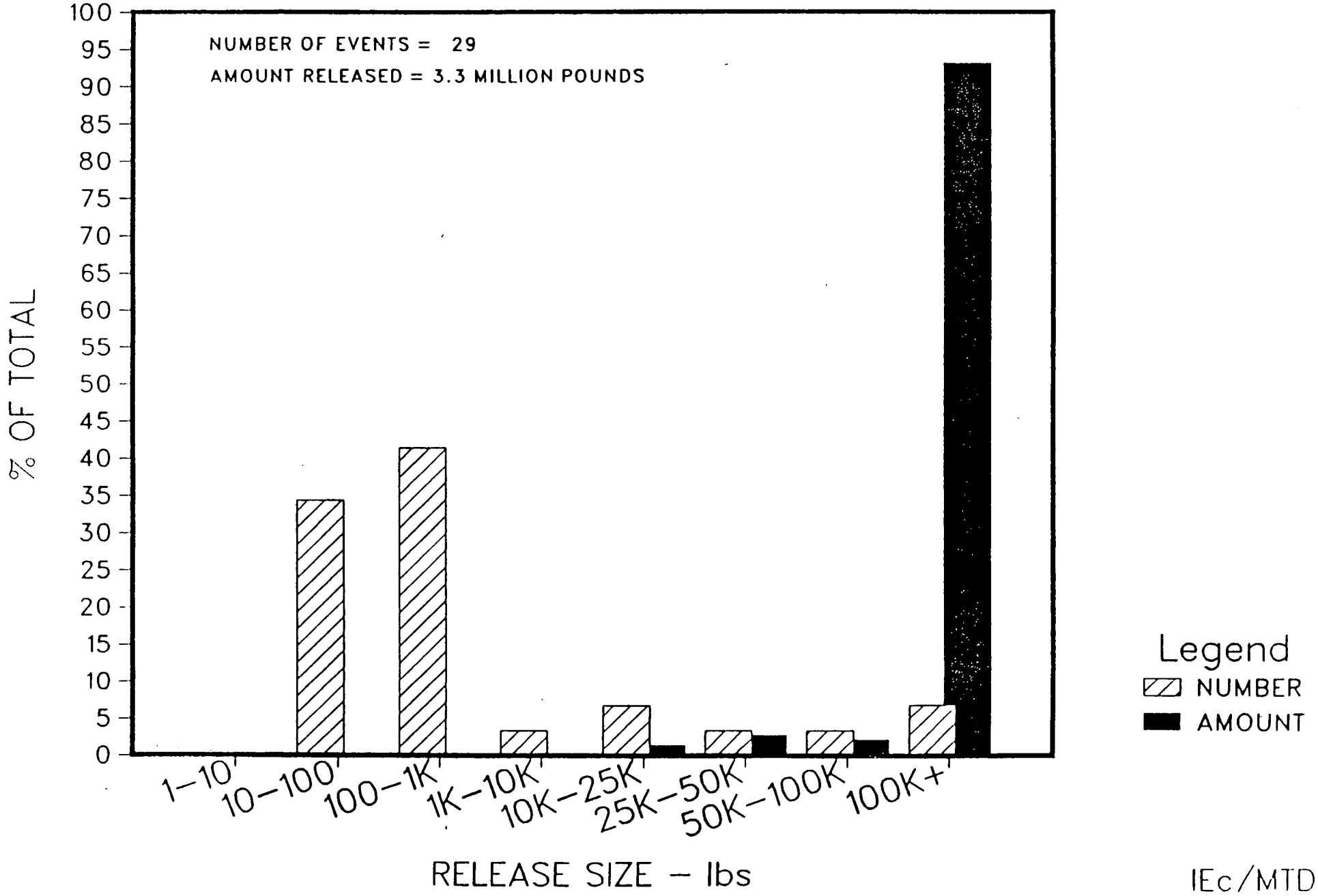



[redacted]

IEc/MTDS [redacted]

Ex[redacted]it [redacted]

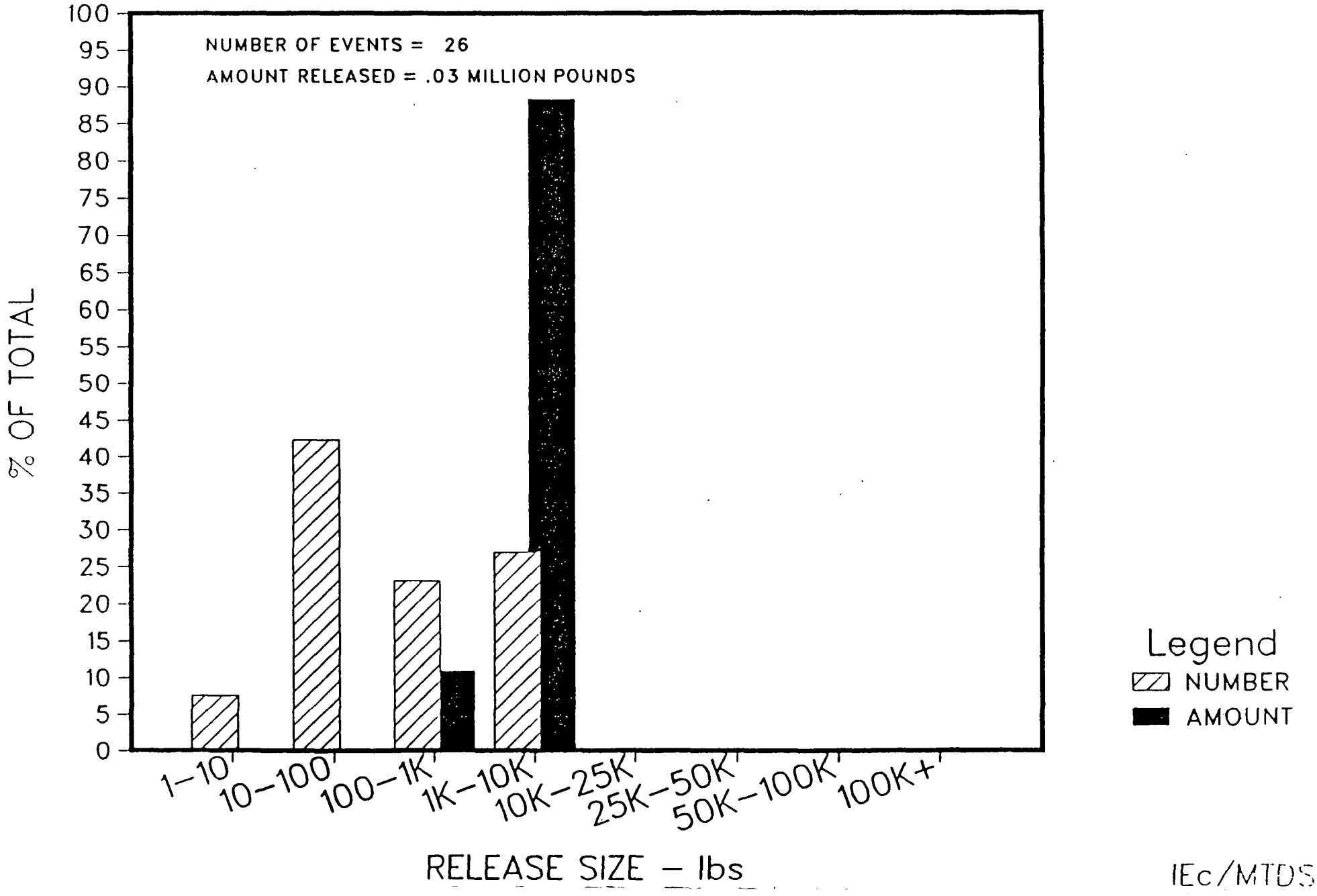
# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN–TRANSIT EVENTS INVOLVING BARGE




IEc/MTDS

Exhibit 58

# ACUTE HAZARDOUS EVENTS DATABASE DISTRIBUTION BY RELEASE SIZE FOR IN-TRANSIT EVENTS INVOLVING OTHER MODES



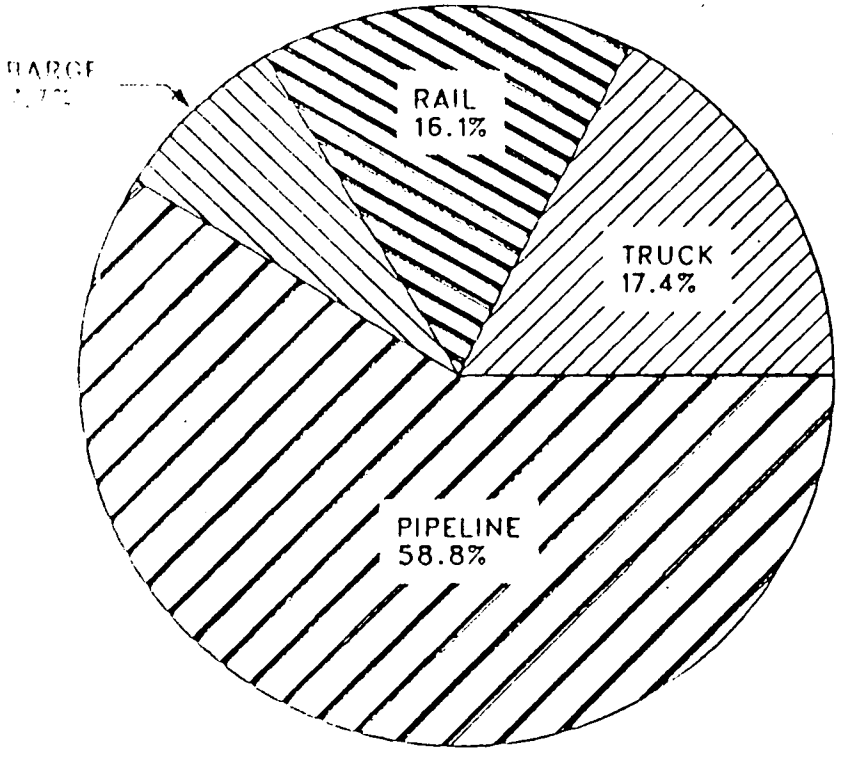

IEc/MTDS

[redacted] Exhibit 59 [redacted]

# ACUTE HAZARDOUS EVENTS DATABASE

## IN–TRANSIT EVENTS BY MODE

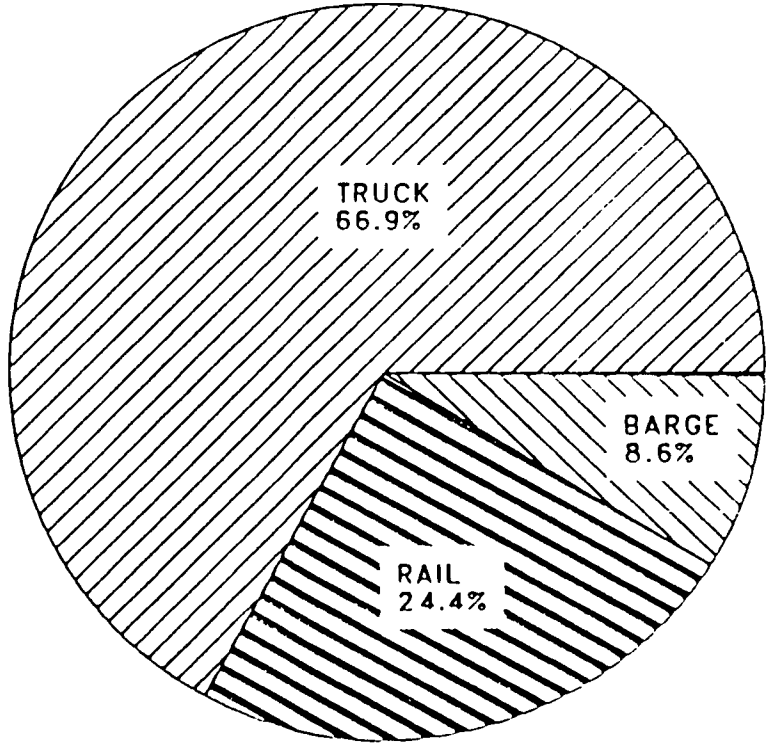
*TOTAL AMOUNT RELEASED*




NUMBER OF EVENTS = 1093

## IN–TRANSIT EVENTS BY MODE

*AMOUNT RELEASED IN DEATH/INJURY EVE*




NUMBER OF EVENTS = 93

IEc/MTI

# APPENDIX A

# DATA CODING AND FORMAT SHEETS

ACUTE HAZARDOUS EVENTS FILE DATABASE ENTRY FORM

(Circle Codes Where Appropriate)

1. Source > _____
   ID > _____

2. Date of Event > / /

3. Time of Day: Hour > Mins >

4. Event Location: Street Address >
   City >
   State >

5. Company Name >

6. Telephone Number: Area Code > Number > -

7. SIC >

8. Substances Involved:
   #1: State > SO/LQ/GS/SW/LW/GW/UU/UW Name >
   #2: State > SO/LQ/GS/SW/LW/GW/UU/UW Name >
   #3: State > SO/LQ/GS/SW/LW/GW/UU/UW Name >

   Comment >

9. Quantity Released:
   Substance #1 > Units > GA/LB/TN/CF
   Substance #2 > Units > GA/LB/TN/CF
   Substance #3 > Units > GA/LB/TN/CF

10. Affected Media: Air > Y/N/U
    Water > Y/N/U
    Land > Y/N/U

11. Duration of Event: Days > Hours > Mins >

12. Property Damage > Y/N/U

    Comment >

13. Environmental Damage > Y/N/U

    Comment >

14. Event Situation > P/T

    Comment >

If "In-Plant" Continue With 15. If "In-Transit" Go to 20.

******* FOR IN-PLANT EVENTS FILL IN 15 THROUGH 19 *******

15. In-Plant Location > PR/ST/VA/OT/UU

    Comment >

16. Primary Cause of Event > EF/OE/CC/FI/OT/UU

    Comment >

17. Operational Configuration > UP/DN/LL/SS/MT/OT/UU

    Comment >

18. High Temperature Contributing > Y/N/U

19. High Pressure Contributing > Y/N/U

********** GO TO LINE 22 **********

-------- FOR IN-TRANSIT EVENTS FILL OUT 20 AND 21 --------

20. In-Transit Mode > R/T/B/P/O

21. In-Transit Accident Cause > CO/LK/OT/UU

---------- CONTINUE WITH 22 ----------

22. End Effect: Effect #1 > SP/FI/VR/EX/OT/UU
    Effect #2 > SP/FI/VR/EX/OT/UU
    Effect #3 > SP/FI/VR/EX/OT/UU
    Effect #4 > SP/FI/VR/EX/OT/UU

    Comment >

23. Injuries > Y/N/U

24. Number of People Injured:

25. Deaths > Y/N/U

26. Number of Deaths >

27. Evacuation Required > Y/N/U

    Comment >

28. General Comments >

ACUTE HAZARDOUS EVENTS FILE DATABASE ENTRY FORMAT

| | | Size of Fiel |
|---|---|---|
| 1. | Source: <3 character database identifier> | c3 |
| | ID : <Any record identifier from dataset> | c70 |
| | -- Each record MUST have a unique ID in order for it to be retrieved by the database for editing. | |
| 2. | Date of Event: <MM/DD/YY> | c2,c2,c2 |
| | Enter -<br>MM - Number of Month<br>DD - Number of Day<br>YY - Number of Year | |
| | -- If the date is unknown, leave this blank. If the month and/or day is not known, enter "01" where necessary. | |
| 3. | Time of Day: <Hours:Minutes> | c2:c2 |
| | Use the 24 hour clock convention. | |
| 4. | Location of Event: <Address, City, State> | c30,c20,c |
| | -- Use P.O. state abbreviations | |
| 5. | Company Name: <Name> | c50 |
| 6. | Telephone No.: <(Area Code)-Number> | c3,c7 |
| 7. | SIC Code: <Enter industry SIC, up to 4 digits> | c4 |
| 8. | Substances Involved: (1) <Physical State, Name> | c2,c30 |
| | (2) <Physical State, Name> | c2,c30 |
| | (3) <Physical State, Name> | c2,c30 |

Circle one of the following codes for physical state -

| | |
|---|---|
| SO - for Solid | SW - for Solid Waste |
| LQ - for Liquid | LW - for Liquid Waste |
| GS - for Gas | GW - for Gaseous Waste |
| UU - for Unknown | UW - for Waste of Unknown State |

and -

The name of the substance can be up to 30 characters long. If more than three substances are reported, enter the three largest here and place the remainder in the Comment field.

Comments: c70

| | | Size of Field |
|---|---|---|
| 9. | Quantity Released: <Amount,Units> | c9,c2 |

-- For each substance: enter a Number up to 9 digits - or - leave blank. If the quantity is provided in descriptive terms (e.g., "a small puddle") rather than in specific units, place that description in the General Comments field.

and -

Circle the appropriate Unit of Measure -
- GA - Gallons
- LB - Pounds
- TN - Tons
- CF - Cubic Feet

10. Affected Media:

| | |
|---|---|
| Air: <Y/N/U> | c1 |
| Water: <Y/N/U> | c1 |
| Land: <Y/N/U> | c1 |

Circle -
- Y - Yes
- N - No
- U - Unknown

-- A response is required for each media. If the EFFECT (#22) is a fire or explosion, then AIR should be considered to be the only media affected, unless otherwise indicated by the data.

| | | |
|---|---|---|
| 11. | Duration of Event: <DDD/HH/MM> | c3,c2,c2 |

Enter -
- DDD - Number of Days, up to 3 digits
- HH - Number of Hours, up to 2 digits
- MM - Number of Months, up to 2 digits

| | | |
|---|---|---|
| 12. | Property Damage: <Y/N/U> | c1 |

Circle -
- Y - Yes
- N - No
- U - Unknown

-- A response MUST be selected.

| | |
|---|---|
| Comment: | c70 |

Size of Fiel

13. Environmental Damage: <Y/N/U> c1

Circle -
Y - Yes
N - No
U - Unknown

-- A response MUST be selected.

Comment: c70

14. Event Situation: <P/T> c1

Circle -
P - If event occurred in plant
T - If event occurred during transit

-- A response MUST be selected.

Comment: c70

15. In-Plant Location: <PR/ST/VA/OT/UU> c2

Circle -
PR - Process Vessel
ST - Storage Vessel
VA - Valves or Piping
OT - Other
UU - Unknown

-- A response MUST be selected if the event is in-plant.

Comment: c70

16. Primary Cause of Event: <EF/OE/CC/FI/OT/UU> c2

Circle -
EF - Equipment Failure
OE - Operator Error
CC - Upset Condition
FI - Fire
OT - Other
UU - Unknown

-- A response MUST be selected if the event is in-plant.

Comment: c70

| | Size of Field |
|---|---|
| 17. Operational Configuration: <UP/DN/LL/SS/MT/OT/UU> | c2 |

Circle -
- UP - Process Start-up
- DN - Process Shut Down
- LL - Loading or Unloading
- SS - Steady State
- MT - Maintenance
- OT - Other
- UU - Unknown

-- A response MUST be selected if the event is in-plant.

| | |
|---|---|
| Comment: | c70 |
| 18. High Temperature Contributing: <Y/N/U> | c1 |

Circle -
- Y - Yes
- N - No
- U - Unknown

-- A response MUST be selected if the event is in-plant.

| | |
|---|---|
| 19. High Pressure Contributing: <Y/N/U> | c1 |

Circle -
- Y - Yes
- N - No
- U - Unknown

-- A response MUST be selected if the event is in-plant.

| | |
|---|---|
| 20. In-Transit Mode: <R/T/B/P/O> | c1 |

Circle -
- R - Rail
- T - Truck
- B - Barge
- P - Pipeline
- O - Other

-- A response MUST be selected if the event is in-transit.

| | Size of Field |
|---|---|
| 21. In-Transit Accident Cause: <CO/LK/OT/UU> | c2 |

Circle -
- CO - Collision
- LK - Leak
- OT - Other
- UU - Unknown

-- A response MUST be selected if the event is in-transit.

| | |
|---|---|
| 22. End Effect: <SP/FI/VR/EX/OT/UU> | c2,c2,c2,c |

Circle -
- SP - Spill
- FI - Fire
- VR - Vapor Release
- EX - Explosion
- OT - Other
- UU - Unknown

-- Codes MUST be selected for four effects. Assign "UU" as default values where necessary.

| | |
|---|---|
| Comment: | c70 |
| 23. Injuries: <Y/R/N/U> | c1 |

Circle -
- Y - Yes
- R - Yes, the number of injuries is unknown
- N - No
- U - Unknown

-- A response MUST be selected.

| | |
|---|---|
| 24. Number of People Injured: <9999999, 0> | c7 |

-- Enter up to 7 digits -- the default value is zero.

| | |
|---|---|
| 25. Deaths: <Y/R/N/U> | c1 |

Circle -
- Y - Yes
- R - Yes, the number of deaths is unknown
- N - No
- U - Unknown

-- A response MUST be selected.

| | Size of Field |
|---|---|
| 26. Number of Deaths: <9999999, 0> | c7 |
| -- Enter up to 7 digits -- the default value is zero. | |
| 27. Evacuation Required: <Y/N/U> | c1 |
| Circle -<br>Y - Yes<br>N - No<br>U - Unknown | |
| -- A response MUST be selected. | |
| Comment: | c70 |
| 28. General Comments: | c280 |

Include here important information which is not included elsewhere, such as:

- o descriptive information about release quantity,
- o remedial response,
- o value of property damaged,
- o number of people hospitalized,
- o extent of injuries,
- o more information about the cause of the event, and
- o important industry information.

# APPENDIX B

## DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATABASE

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| AGENCY: | California Office of Emergency Services |
| NUMBER OF INCIDENTS PER YEAR: | About 1,700 |
| PERIOD OF RECORDS USED: | 1984 - 1985 |
| NUMBER OF RECORDS USED: | 141 |
| BREAKDOWN OF INCIDENTS: | About 1,000 each year are oil spills, the rest chemical-related |
| TYPICAL TYPE OF RELEASE: | Many transportation incidents |
| MEDIA AFFECTED: | All, particularly land |
| SOURCE OF REPORT: | Companies needing assistance with clean-up, highway patrol, fire departments |
| PURPOSE OF SYSTEM: | Used by a warning control center which collects information pertaining to accidental releases and conveys the information to other agencies for appropriate clean-up actions |
| COMPUTERIZED? | A pilot project initiated in July 1984 to investigate after-effects of releases is currently being computerized |
| COMMENTS: | Very little information on causative factors; very little data on process releases |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| AGENCY: | Texas Air Control Board |
| NUMBER OF INCIDENTS PER YEAR: | Several thousand |
| PERIOD OF RECORDS USED: | 1980 - 1985 |
| NUMBER OF RECORDS USED: | 442 |
| BREAKDOWN OF INCIDENTS: | Majority of records do not list contaminants; of those listed, 60 to 70 percent are hazardous |
| TYPICAL TYPE OF RELEASE: | Equipment failures and maintenance releases are common |
| MEDIA AFFECTED: | Air only |
| SOURCE OF REPORT: | Companies within the state are required to report all upsets and maintenance-related releases |
| PURPOSE OF SYSTEM: | State schedules necessary inspections to the plants and takes appropriate regulatory action based upon the type and frequency of releases |
| COMPUTERIZED? | Yes |
| COMMENTS: | Little information on environmental impacts, causes, property damage, injuries, evacuation |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| AGENCY: | New Jersey Department of Environmental Quality |
| NUMBER OF INCIDENTS PER YEAR: | 100 to 150 |
| PERIOD OF RECORDS USED: | 1983 - 1985 |
| NUMBER OF RECORDS USED: | 116 |
| BREAKDOWN OF INCIDENTS: | About 75 to 80 percent of the incidents involve hazardous materials |
| TYPICAL TYPE OF RELEASE: | Mostly large releases; evacuations, injuries, fires, and explosions are common |
| MEDIA AFFECTED: | All |
| SOURCE OF REPORT: | Usually fire or police department |
| PURPOSE OF SYSTEM: | Unknown |
| COMPUTERIZED? | Currently developing system |
| COMMENTS: | No information on causes |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| AGENCY: | Ohio Environmental Protection Agency |
| NUMBER OF INCIDENTS PER YEAR: | 200 to 300 |
| PERIOD OF RECORDS USED: | 1981 - 1985 |
| NUMBER OF RECORDS USED: | 263 |
| BREAKDOWN OF INCIDENTS: | About 50 percent are citizen complaints which involve non-hazardous materials |
| TYPICAL TYPE OF RELEASE: | Mostly equipment failures and transportation incidents; anhydrous ammonia, sulfuric acid, and hydrochloric acid are commonly reported substances |
| MEDIA AFFECTED: | All |
| SOURCE OF REPORT: | Company (if serious release) or citizen complaint |
| PURPOSE OF SYSTEM: | Used as a priority-setting tool for investigating companies |
| COMPUTERIZED? | Yes |
| COMMENTS: | Well organized system backed up with hard copies which are easily accessible through incident report numbers |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| AGENCY: | U.S. Environmental Protection Agency, Region VII, Emergency Planning and Response Branch |
| NUMBER OF INCIDENTS PER YEAR: | About 1,500 |
| PERIOD OF RECORDS USED: | 1981 - 1985 |
| NUMBER OF RECORDS USED: | 513 |
| BREAKDOWN OF INCIDENTS: | About one-third to one-half are oil spills |
| TYPICAL TYPE OF RELEASE: | All types of incidents, from very small to very large |
| MEDIA AFFECTED: | All, incidents evenly distributed among air, water, and land |
| SOURCE OF REPORT: | About 60 percent are from the company involved; the rest come from state agencies, the NRC, and private citizens |
| PURPOSE OF SYSTEM: | Used to prepare summary reports for the team that responds to the incident |
| COMPUTERIZED? | For the last two years |
| COMMENTS: | Well organized system |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| AGENCY: | National Response Center |
| NUMBER OF INCIDENTS PER YEAR: | About 10,000 |
| PERIOD OF RECORDS USED: | 1983 - 1984 |
| NUMBER OF RECORDS USED: | 1,225 |
| BREAKDOWN OF INCIDENTS: | About 56 percent oil related, 25 percent non-CERCLA hazardous materials, and 19 percent CERCLA hazardous substances |
| TYPICAL TYPE OF RELEASE: | Many in-plant releases, typically due to equipment failure |
| MEDIA AFFECTED: | Water (42 percent) and land (30 percent). Air is less common (10 percent) and remainder are unknown. |
| SOURCE OF REPORT: | Companies are required to report incidents in which the quantity released is greater than the reportable quantity (RQ) for the substance involved. Complaints from private citizens are also included. |
| PURPOSE OF SYSTEM: | Single point of notification of federal authorities of any release of hazardous materials and other pollution incidents |
| COMPUTERIZED? | Yes |
| COMMENTS: | Operated by US Coast Guard. Little data on event duration, property damage, and environmental damage. |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| AGENCY: | California Highway Patrol |
| NUMBER OF INCIDENTS PER YEAR: | About 200 to 300 |
| PERIOD OF RECORDS USED: | 1983 - 1985 |
| NUMBER OF RECORDS USED: | 67 |
| BREAKDOWN OF INCIDENTS: | About half are hazardous, but often very small quantities are involved |
| TYPICAL TYPE OF RELEASE: | All transportation releases |
| MEDIA AFFECTED: | Mostly land |
| SOURCE OF REPORT: | Unknown |
| PURPOSE OF SYSTEM: | Unknown |
| COMPUTERIZED? | No |
| COMMENTS: | No information on property or environmental damage and end effects |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| SOURCE: | New York Times (NYT) |
| NUMBER OF INCIDENTS PER YEAR: | 10 to 15 |
| PERIOD OF RECORDS USED: | 1980 - 1984 |
| NUMBER OF RECORDS USED: | 46 |
| BREAKDOWN OF INCIDENTS: | Major newsworthy accidents. Northeast U.S. focus, but nation-wide as well. |
| TYPICAL TYPE OF RELEASE: | In-plant and transport, with injuries, evacuations or deaths. |
| MEDIA AFFECTED: | All |
| SOURCE OF REPORT: | N.Y. Times and wire service reporters. |
| PURPOSE OF SOURCE: | News |
| COMPUTERIZED?: | Yes; full text on-line. |
| COMMENTS: | Larger events often duplicated in other news media sources (and later eliminated). |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| SOURCE: | New Orleans Times-Picayunne (NTP) |
| NUMBER OF INCIDENTS PER YEAR: | 33 |
| PERIOD OF RECORDS USED: | 1980 - 1981 |
| NUMBER OF RECORDS USED: | 65 |
| BREAKDOWN OF INCIDENTS: | Major newsworthy accidents along the Gulf Coast, plus larger national interest events. Many events of smaller consequence of local New Orleans interest. |
| TYPICAL TYPE OF RELEASE: | Transportation and in-plant events with injuries, evacuations and deaths. Smaller local events tend to be transport collisions and some in-plant releases with small-scale evacuations. |
| MEDIA AFFECTED: | All. More river spills than other news media. |
| SOURCE OF REPORT: | New Orleans Times-Picayunne and wire service reporters. |
| PURPOSE OF SOURCE: | News |
| COMPUTERIZED?: | No |
| COMMENTS: | Larger events often duplicated in other news media (and later eliminated). |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| SOURCE: | Chicago Tribune (CHT) |
| NUMBER OF INCIDENTS PER YEAR: | 6 |
| PERIOD OF RECORDS USED: | 1980 - 1981 |
| NUMBER OF RECORDS USED: | 12 |
| BREAKDOWN OF INCIDENTS: | Major newsworthy events in upper mid-west |
| TYPICAL TYPE OF RELEASE: | In-plant and transport, with injuries, evacuations or deaths. |
| MEDIA AFFECTED: | All |
| SOURCE OF REPORT: | Chicago Tribune and wire services reporters |
| PURPOSE OF SOURCE: | News |
| COMPUTERIZED?: | No |
| COMMENTS: | Some larger events duplicated in other news sources (and later eliminated). |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| SOURCE: | Los Angeles Times (LAT) |
| NUMBER OF INCIDENTS PER YEAR: | 7 |
| PERIOD OF RECORDS USED: | 1979 - 1984 |
| NUMBER OF RECORDS USED: | 28 |
| BREAKDOWN OF INCIDENTS: | Major newsworthy events in California and more minor accidents, collisions etc. in L.A. area. |
| TYPICAL TYPE OF RELEASE: | Both in-plant and transport, with injuries, evacuations or deaths. |
| MEDIA AFFECTED: | All |
| SOURCE OF REPORT: | L.A. Times and wire services reporters |
| PURPOSE OF SOURCE: | News |
| COMPUTERIZED?: | No |
| COMMENTS: | Some larger events duplicated in other news sources (and later eliminated). |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| SOURCE: | United Press International (UPI) |
| NUMBER OF INCIDENTS PER YEAR: | 62 |
| PERIOD OF RECORDS USED: | April 1983 - July 1985 |
| NUMBER OF RECORDS USED: | 139 |
| BREAKDOWN OF INCIDENTS: | Mostly major accidents with regional and national interest. |
| TYPICAL TYPE OF RELEASE: | Both in-plant and transport, with injuries, evacuations or deaths. |
| MEDIA AFFECTED: | All |
| SOURCE OF REPORT: | UPI reporters |
| PURPOSE OF SOURCE: | News |
| COMPUTERIZED?: | Yes; full text of stories on-line. |
| COMMENTS: | Some events duplicated in other news sources (and later eliminated). |

DATA SOURCES USED FOR ACUTE HAZARDOUS EVENTS DATA BASE

| | |
|---|---|
| SOURCE: | Marsh and McLennon (MM) |
| NUMBER OF INCIDENTS PER YEAR: | 2 to 3 |
| PERIOD OF RECORDS USED: | 1956 - 1984 |
| NUMBER OF RECORDS USED: | 64 |
| BREAKDOWN OF INCIDENTS: | The U.S. portion of MM's listing of the 100 largest industrial accidents, measured by property damage and economic loss. Cost per incident (estimated in 1985 dollars) ranges from $10 million to over $100 million. |
| TYPICAL TYPE OF RELEASE: | Mostly in-plant, with accidents either caused by or resulting in fires and explosions. Heavy emphasis on petroleum facilities, but chemicals processing is represented as well. |
| MEDIA AFFECTED: | Many air, but liquid spills to plant grounds (and later igniting) also frequent. |
| SOURCE OF REPORT: | MM's records -- apparently from a mix of their staff's investigations and published accounts. |
| PURPOSE OF SOURCE: | Safety engineering analysis and consulting services. |
| COMPUTERIZED?: | No |
| COMMENTS: | Most from 1980 on also appeared in one or more of the news sources (and duplicates were later eliminated.) Coded the pre-1980 events in order to have a larger number of major events of a coherent type for analysis, since these are relatively rare. |

# APPENDIX C

# CHEMICALS IN THE ACUTE HAZARDOUS EVENTS DATABASE

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| 1,1 Dichloroethane | 2869 | 75-34-3 | | | 1 | 0 | 0 | 0 |
| 1,1,1 Trichloroethane | 2869 | 71-55-6 | | | 6 | 0 | 0 | 2 |
| 1,1,2-Trichloroethane | 2869 | 79-00-5 | | | 1 | 0 | 0 | 0 |
| 1,4-Diethylene Oxide | 2869 | 123-91-1 | | | 1 | 0 | 0 | 0 |
| 1-Naphthyl N-Methyl Carbamate | 2879 | 63-25-2 | | | 1 | 0 | 0 | 0 |
| 2,1,6 Dimethylcyclohexane | 2865 | | | | 1 | 0 | 0 | 0 |
| 2,2-Dibromo-3-Nitropropylamine | 2869 | | | | 2 | 0 | 0 | 2 |
| 2,4 D/ Banzo Mixture | 2879 | 94-75-7 | | | 1 | 0 | 0 | 0 |
| 2,4,5-T/Paraquat | 2879 | 93-76-5 | 1910-42-5 | 4685-14-7 | 1 | 0 | 0 | 0 |
| 2,4-Dichlorophenoxyacetic Acid | 2879 | 94-75-7 | | | 1 | 0 | 0 | 1 |
| 2-2-Azobisisobutyronitrile | 2869 | 78-67-1 | | | 1 | 0 | 0 | 0 |
| 2-Diazo-1-Naphthol-5-Sulfonic | 2865 | | | | 1 | 0 | 0 | 0 |
| 4,4-Isopropylidenediphenol | 2865 | 80-05-7 | | | 2 | 0 | 0 | 0 |
| ABS Resin | 2821 | 9003-56-9 | | | 1 | 0 | 0 | 0 |
| Acetaldehyde | 2869 | 75-07-0 | | | 5 | 0 | 0 | 2 |
| Acetate Homopolymer | 2821 | | | | 1 | 0 | 0 | 0 |
| Acetic Acetate | 2869 | | | | 1 | 0 | 0 | 0 |
| Acetic Acid | 2869 | 64-19-7 | | | 15 | 5 | 0 | 1 |
| Acetic Anhydride | 2869 | 108-24-7 | | | 3 | 2 | 0 | 1 |
| Acetone | 2869 | 67-64-1 | | | 17 | 3 | 0 | 1 |
| Acetone/Nitric Acid | 2869 | 67-64-1 | | | 1 | 0 | 1 | 1 |
| Acetonitrile | 2869 | 75-05-8 | | | 4 | 0 | 0 | 0 |
| Acetophenone | 2865 | 98-86-2 | | | 1 | 0 | 0 | 0 |
| Acetyl Chloride | 2869 | 75-36-5 | | | 1 | 0 | 0 | 0 |
| Acetylene | 2813 | 74-86-2 | | | 4 | 1 | 0 | 1 |
| Acid | 2819 | | | | 20 | 3 | 0 | 3 |
| Acrolein | 2869 | 107-02-8 | | | 2 | 0 | 0 | 1 |
| Acrylamide | 2869 | 79-06-1 | 110-26-9 | | 4 | 1 | 0 | 1 |
| Acrylate | 2869 | 10344-93-1 | | | 3 | 0 | 0 | 1 |
| Acrylate Polyamine | 2821 | | | | 1 | 0 | 0 | 0 |
| Acrylic Acid | 2869 | 79-10-7 | | | 4 | 1 | 0 | 0 |
| Acrylic Coating | 2821 | 9003-01-4 | | | 1 | 0 | 0 | 0 |
| Acrylic Resin | 2821 | 9003-01-4 | | | 1 | 1 | 0 | 0 |
| Acrylonitrile | 2869 | 107-13-1 | | | 20 | 7 | 2 | 3 |
| Acrylonitrile/Butadiene | 2869 | 107-13-1 | 106-99-0 | | 1 | 0 | 0 | 0 |
| Adhesive | 2891 | | | | 1 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Agricultural Chemicals | 2870 | | | | 4 | 0 | 0 | 0 |
| Alcohol | 2869 | | | | 8 | 1 | 1 | 1 |
| Aldehyde | 2869 | 75-07-0 | 80-54-6 | | 2 | 0 | 0 | 0 |
| Aldicarb | 2879 | 116-06-3 | | | 1 | 0 | 0 | 1 |
| Aldrin | 2879 | 309-00-2 | | | 1 | 0 | 0 | 0 |
| Alkali | 2812 | | | | 2 | 1 | 0 | 1 |
| Alkalyd Resin | 2821 | | | | 1 | 0 | 0 | 0 |
| Alkyl Phenol | 2865 | | | | 1 | 0 | 0 | 0 |
| Alkylate | 2911 | | | | 1 | 0 | 0 | 0 |
| Alkyldimethybenzylammoniumchl | 2865 | | | | 1 | 0 | 0 | 0 |
| Allyl Alcohol | 2869 | 107-18-6 | | | 3 | 2 | 0 | 1 |
| Allyl Chloride | 2869 | 107-05-1 | | | 1 | 0 | 0 | 0 |
| Allyl Glycidylether | 2869 | 106-92-3 | | | 1 | 1 | 0 | 0 |
| Alpha Methyl Styrene | 2821 | 98-83-9 | | | 1 | 0 | 0 | 0 |
| Alumina Hydrosol | 2819 | | | | 1 | 0 | 0 | 0 |
| Aluminum | 3300 | 7429-90-5 | | | 2 | 1 | 0 | 0 |
| Aluminum Catalyst Base | 2819 | | | | 2 | 0 | 0 | 0 |
| Aluminum Chloride | 2819 | 7446-70-0 | 7784-13-6 | | 1 | 0 | 0 | 0 |
| Aluminum Diethylhydride | 2819 | | | | 2 | 0 | 0 | 0 |
| Aluminum Phosphide | 2819 | 20859-73-8 | | | 2 | 1 | 1 | 1 |
| Aluminum Silicon Powder | 2819 | | | | 1 | 0 | 0 | 0 |
| Aluminum Sulfate | 2819 | 10043-01-3 | 10124-29-5 | 67112-80-5 | 3 | 0 | 0 | 0 |
| Aluminum Triethyl | 2819 | 97-93-8 | | | 1 | 0 | 0 | 0 |
| Amine | 2869 | | | | 1 | 0 | 0 | 0 |
| Ammonia | 2873 | 1336-21-6 | 7664-41-7 | | 57 | 14 | 1 | 11 |
| Ammonia Sulfate | 2819 | 7783-20-2 | | | 1 | 1 | 0 | 1 |
| Ammonium Chloride | 2819 | 12125-02-9 | | | 3 | 1 | 0 | 1 |
| Ammonium Dichloride | 2819 | | | | 1 | 0 | 0 | 0 |
| Ammonium Hydroxide | 2819 | 1336-21-6 | | | 8 | 0 | 0 | 0 |
| Ammonium Nitrate | 2873 | 6484-02-2 | | | 10 | 1 | 0 | 3 |
| Ammonium Nitrate Urea | 2873 | 15978-77-5 | | | 2 | 0 | 0 | 0 |
| Ammonium Persulfate | 2819 | 7727-54-0 | | | 1 | 0 | 0 | 0 |
| Ammonium Phosphate | 2819 | 7722-76-1 | 7783-28-0 | 10124-34-9 | 1 | 0 | 0 | 0 |
| Ammonium Salt | 2819 | 53956-04-0 | | | 1 | 0 | 0 | 0 |
| Ammonium Sulfate | 2873 | 7783-20-2 | 10043-02-4 | 32736-64-4 | 1 | 1 | 0 | 0 |
| Ammonium Sulfide | 2819 | 12124-99-1 | 12135-76-1 | | 2 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Ammonium Thiosulfate | 2819 | 7783-18-8 | | | 2 | 0 | 0 | 0 |
| Amosol Naphtha HF395 | 2865 | | | | 1 | 0 | 0 | 0 |
| Anhydrous Ammonia | 2873 | 7664-41-7 | | | 220 | 34 | 2 | 28 |
| Anhydrous Dimethylamine | 2869 | 124-40-3 | | | 1 | 0 | 0 | 1 |
| Anhydrous Hydrochloric Acid | 2819 | 7647-01-0 | | | 2 | 1 | 0 | 0 |
| Anhydrous Hydrogen | 2813 | 1333-74-0 | | | 1 | 1 | 0 | 1 |
| Anhydrous Trimethylamine | 2869 | 75-50-3 | | | 1 | 1 | 0 | 1 |
| Aniline | 2865 | 62-53-3 | | | 1 | 0 | 0 | 0 |
| Anionic Polyacrylamide | 2821 | | | | 1 | 0 | 0 | 0 |
| Antimony Pentachloride | 2819 | 7647-18-9 | | | 1 | 0 | 0 | 0 |
| Antimony Trioxide | 2819 | 1309-64-4 | | | 1 | 1 | 0 | 0 |
| Argon | 2813 | 7440-37-1 | | | 2 | 0 | 0 | 1 |
| Arsenate/Chromium/Copper | 3300 | 7778-39-4 | 7440-47-3 | 7440-50-8 | 1 | 0 | 0 | 0 |
| Arsenic | 3300 | 7440-38-2 | | | 1 | 0 | 0 | 0 |
| Arsenic Pentoxide | 2819 | 1303-28-2 | | | 1 | 0 | 0 | 0 |
| Asbestos | 3292 | 1332-21-4 | | | 9 | 0 | 0 | 3 |
| Asphalt | 2911 | 8052-42-4 | | | 3 | 3 | 0 | 0 |
| Asphalt Byproduct | 2911 | | | | 1 | 0 | 0 | 0 |
| Asphalt Tar | 2911 | | | | 1 | 0 | 0 | 0 |
| Atrazine | 2879 | 1912-24-9 | | | 4 | 1 | 0 | 0 |
| Atrazine/Lasso/Nitrogen | 2879 | 1912-24-9 | 15972-60-8 | 7727-37-9 | 1 | 0 | 0 | 0 |
| Azidodinitroethane | 2869 | | | | 1 | 1 | 0 | 1 |
| Azobisisobutylnitrile | 2869 | 78-67-1 | | | 1 | 0 | 0 | 0 |
| Bactericide 400 | 2879 | | | | 1 | 0 | 0 | 0 |
| Ballast Tank Coating Flo-Coat | 2899 | | | | 1 | 0 | 0 | 0 |
| Banueal 720 | 2879 | 8068-77-7 | | | 1 | 0 | 0 | 0 |
| Banvel | 2879 | 1918-00-9 | | | 2 | 0 | 0 | 0 |
| Benzene | 2865 | 71-43-2 | | | 26 | 5 | 1 | 2 |
| Benzene/Ethanol | 2865 | 71-43-2 | 64-17-5 | | 2 | 0 | 0 | 0 |
| Benzene/Toluene | 2865 | 71-43-2 | 108-88-3 | | 2 | 0 | 0 | 0 |
| Benzyl Bromoacetate | 2865 | 5437-45-6 | | | 1 | 1 | 0 | 0 |
| Benzyl Chloride | 2865 | 100-44-7 | 25168-05-2 | | 1 | 0 | 0 | 0 |
| Beta Phenyl Ethanol | 2865 | 60-12-8 | | | 1 | 0 | 0 | 0 |
| Bicep | 2879 | 51218-45-2 | | | 1 | 0 | 0 | 0 |
| Bis (2-Ethylhexyl) Phthalate | 2869 | 117-81-7 | | | 1 | 0 | 0 | 0 |
| Blasting Caps | 2892 | | | | 1 | 0 | 0 | 1 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Blue Dye | 2816 | | | | 2 | 0 | 0 | 0 |
| Borex Resin | 2821 | | | | 1 | 0 | 0 | 0 |
| Boron Trifluoride | 2819 | 7637-07-2 | | | 1 | 0 | 0 | 0 |
| Boron Trisulfate | 2819 | | | | 1 | 0 | 0 | 0 |
| Bromochloroethane | 2869 | 107-04-0 | | | 1 | 1 | 0 | 1 |
| Bronze | 3300 | 12597-70-5 | | | 1 | 0 | 0 | 0 |
| Bunker "C" Oil | 2911 | | | | 1 | 0 | 0 | 0 |
| Butadiene | 2869 | 106-99-0 | | | 23 | 2 | 0 | 3 |
| Butadiene Dimethyl Amine | 2869 | | | | 1 | 0 | 0 | 0 |
| Butane | 2869 | 106-97-8 | | | 13 | 5 | 1 | 2 |
| Butane Mercaptan | 2869 | 109-79-5 | 75-66-1 | | 1 | 1 | 0 | 0 |
| Butyl Acetate | 2869 | 123-86-4 | | | 9 | 1 | 0 | 0 |
| Butyl Acrylate | 2869 | 106-63-8 | 141-32-2 | | 2 | 0 | 0 | 0 |
| Butyl Alcohol | 2869 | 71-36-3 | | | 2 | 0 | 0 | 0 |
| Butyl Creosol | 2869 | 5736-70-9 | 2409-55-4 | | 1 | 0 | 0 | 0 |
| Butyl Isocyanate | 2869 | 111-36-4 | | | 2 | 0 | 0 | 0 |
| Butyl Mercaptan | 2869 | 109-79-5 | | | 1 | 0 | 0 | 0 |
| Butyl Methacrylate | 2869 | 97-88-1 | | | 1 | 0 | 0 | 0 |
| Butylene | 2869 | 25167-67-3 | | | 1 | 0 | 0 | 0 |
| Butylene | 2869 | 25167-67-3 | | | 0 | 0 | 0 | 0 |
| Cadmium Hydroxide | 2819 | 29736-89-8 | | | 1 | 0 | 0 | 0 |
| Cadmium Nitrate | 2819 | 10325-94-7 | | | 1 | 0 | 0 | 0 |
| Calcined Alumina | 2819 | | | | 1 | 0 | 0 | 1 |
| Calcium Bromide | 2819 | 7789-41-5 | | | 1 | 0 | 0 | 0 |
| Calcium Carbide | 2819 | 75-20-7 | | | 1 | 0 | 0 | 0 |
| Calcium Chloride | 2819 | 15606-71-0 | 10035-04-8 | 10043-52-4 | 1 | 0 | 0 | 1 |
| Calcium Chlorine | 2819 | | | | 1 | 1 | 0 | 0 |
| Calcium Hypochlorite | 2819 | 7778-54-3 | | | 3 | 2 | 0 | 1 |
| Calcium Nitrate | 2819 | 10124-37-5 | | | 5 | 0 | 0 | 0 |
| Calcium Oxide | 2819 | 1305-78-8 | | | 3 | 0 | 0 | 0 |
| Californium 252 | 3300 | 13981-17-4 | | | 1 | 0 | 0 | 0 |
| Carbaryl | 2879 | 63-25-2 | | | 1 | 0 | 0 | 0 |
| Carbofuran | 2879 | 1563-66-2 | | | 3 | 0 | 0 | 0 |
| Carbon Bisulfide | 2819 | 75-15-0 | | | 1 | 0 | 0 | 0 |
| Carbon Black | 2895 | 1333-86-4 | | | 1 | 0 | 0 | 0 |
| Carbon Dioxide | 2813 | 124-38-9 | | | 5 | 1 | 0 | 1 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Carbon Disulfide | 2869 | 75-15-0 | | | 5 | 2 | 0 | 1 |
| Carbon Monoxide | 2813 | 630-08-8 | | | 13 | 0 | 0 | 0 |
| Carbon Tetrachloride | 2869 | 56-23-5 | | | 13 | 0 | 0 | 0 |
| Carbon Tetrachloride/Chlorine | 2869 | 56-23-5 | 7782-50-5 | | 1 | 0 | 0 | 0 |
| Carbon Tetrachloride/Disulfide | 2869 | 56-23-5 | 75-15-0 | | 1 | 0 | 0 | 0 |
| Carboxin | 2879 | 52-34-68-4 | | | 1 | 1 | 0 | 0 |
| Catalyst | 2819 | | | | 3 | 0 | 0 | 0 |
| Caustic | 2812 | 13210-73-2 | | | 1 | 0 | 0 | 0 |
| Caustic Soda | 2812 | 1310-73-2 | | | 2 | 0 | 0 | 0 |
| Chlordane | 2879 | 57-74-9 | 12789-03-6 | | 6 | 3 | 0 | 3 |
| Chlorides | 2819 | | | | 2 | 0 | 0 | 0 |
| Chlorinated Hydrocarbons | 2869 | | | | 2 | 1 | 0 | 0 |
| Chlorinated Methane | 2869 | | | | 1 | 0 | 0 | 0 |
| Chlorinated Rubber Chromate | 2869 | | | | 1 | 1 | 0 | 0 |
| Chlorinated Solvents | 2869 | | | | 1 | 1 | 0 | 0 |
| Chlorine | 2812 | 7782-50-5 | | | 237 | 46 | 3 | 27 |
| Chlorine Bleach | 2812 | 8012-77-9 | | | 1 | 1 | 0 | 1 |
| Chlorine Dioxide | 2819 | 10049-04-4 | | | 1 | 0 | 0 | 0 |
| Chlorobenzene | 2865 | 108-90-7 | | | 2 | 0 | 0 | 0 |
| Chloroethane | 2869 | 75-00-3 | | | 1 | 0 | 0 | 0 |
| Chloroform | 2869 | 67-66-3 | | | 1 | 0 | 0 | 0 |
| Chloropicrin | 2869 | 76-06-2 | | | 1 | 1 | 0 | 0 |
| Chloroprene | 2822 | 126-99-8 | | | 2 | 1 | 0 | 1 |
| Chlorosilanes | 2819 | | | | 1 | 0 | 0 | 0 |
| Chlorothioformate | ---- | 16890-85-0 | | | 2 | 0 | 0 | 0 |
| Chrome | 3300 | 7440-47-3 | | | 2 | 0 | 0 | 0 |
| Chrome/Cobalt/Iron Acetonates | 3300 | | | | 1 | 0 | 0 | 0 |
| Chromic Acid | 2819 | 1333-82-0 | 7738-94-5 | 13530-68-2 | 15 | 2 | 0 | 3 |
| Chromic Acid | 2819 | 1333-82-0 | 7738-94-5 | 13530-68-2 | 0 | 0 | 0 | 0 |
| Chromic Acid/Solvent | 2819 | | | | 1 | 0 | 0 | 0 |
| Chromic Anhydride | 2819 | 1333-82-0 | 7738-94-5 | | 2 | 0 | 0 | 0 |
| Chromium | 3300 | 7440-47-3 | | | 3 | 0 | 0 | 0 |
| Chromium Hydroxide | 2819 | 12626-43-6 | 59330-19-7 | | 1 | 0 | 0 | 0 |
| Chromyl Chloride | 2819 | 14977-61-8 | | | 1 | 0 | 0 | 0 |
| Class B Poison | ---- | | | | 1 | 0 | 0 | 1 |
| Cleaning Compound | 2840 | | | | 1 | 1 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Coal Ash | ---- | | | | 1 | 0 | 0 | 0 |
| Coal Tar | 2865 | 8007-45-2 | 8030-30-6 | 65996-89-6 | 1 | 1 | 1 | 0 |
| Coal Tar Dye | 2865 | | | | 2 | 1 | 0 | 0 |
| Combustible Gas | 2813 | | | | 1 | 0 | 0 | 0 |
| Copper | 3300 | 7440-50-8 | | | 2 | 0 | 0 | 0 |
| Copper Oxide | 2819 | 1317-38-0 | 1317-39-1 | 66020-58-4 | 1 | 0 | 0 | 0 |
| Copper Sulfate | 2819 | 1344-73-6 | 7758-98-7 | 17599-81-4 | 3 | 1 | 0 | 1 |
| Corrosive Alkaline Liquid | 2812 | | | | 1 | 0 | 0 | 0 |
| Corrosive Material | 2819 | | | | 2 | 1 | 0 | 0 |
| Creosote | 2865 | 8001-58-9 | 8021-39-4 | | 7 | 0 | 0 | 0 |
| Creosote/Coal Tar | 2865 | 8001-58-9 | 8021-39-4 | 8007-45-2 | 5 | 0 | 0 | 0 |
| Cresol | 2865 | 108-39-4 | 1319-77-3 | | 1 | 0 | 0 | 0 |
| Cresylic Acid | 2865 | 95-48-7 | 1319-77-3 | | 1 | 1 | 0 | 0 |
| Crude Oil | 2911 | 8002-05-9 | | | 15 | 6 | 1 | 4 |
| Cumene | 2865 | 98-82-8 | | | 3 | 0 | 0 | 0 |
| Cumene Hydroxide | 2865 | | | | 1 | 0 | 0 | 0 |
| Cyanide | 2819 | 57-12-5 | | | 7 | 3 | 0 | 2 |
| Cyclohexane | 2865 | 110-82-7 | 108-94-1 | | 9 | 0 | 0 | 1 |
| Cyclohexanone | 2865 | 108-94-1 | | | 1 | 0 | 0 | 0 |
| Cyclohexanone/MEK | 2865 | 108-94-1 | 78-93-3 | | 1 | 0 | 0 | 0 |
| Cyclohexyl Mercaptan | 2865 | 1569-69-3 | | | 2 | 0 | 0 | 0 |
| Denatured Alcohol | 2869 | | | | 2 | 0 | 0 | 0 |
| Detergent | 2841 | | | | 1 | 0 | 0 | 0 |
| Di-Xylylene | 2865 | 1633-22-3 | 2319-97-3 | | 1 | 0 | 0 | 0 |
| Diallyl Maleate | 2869 | 999-21-3 | | | 1 | 0 | 0 | 0 |
| Diaminodiphenylmethane | 2869 | 101-77-9 | | | 1 | 0 | 0 | 0 |
| Diaminodithenylmethane | 2869 | | | | 1 | 0 | 0 | 0 |
| Diatomaceous Earth | 1400 | | | | 2 | 0 | 0 | 0 |
| Diazinon | 2879 | 333-41-5 | | | 4 | 0 | 0 | 1 |
| Dibromochloropropane | 2879 | 96-12-8 | 67708-83-2 | | 1 | 0 | 0 | 0 |
| Dichlorobenzene | 2865 | 106-46-7 | 25321-22-6 | | 1 | 0 | 0 | 0 |
| Dichlorodifluoromethane | 2869 | 75-71-8 | | | 2 | 0 | 0 | 0 |
| Dichloroethane | 2869 | 1300-21-6 | 75-34-3 | 107-06-2 | 1 | 0 | 0 | 0 |
| Dichloroethyl Ether | 2869 | 111-44-4 | | | 1 | 0 | 0 | 0 |
| Dichloroethylene | 2869 | 107-06-2 | 25323-30-2 | | 1 | 0 | 0 | 0 |
| Dichlorofluoromethane | 2869 | 75-43-4 | | | 1 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Dichloromethane | 2869 | 75-09-2 | | | 6 | 1 | 0 | 0 |
| Dichlorophenol | 2865 | 25167-81-1 | | | 1 | 0 | 0 | 0 |
| Dichloropropane | 2869 | 78-87-5 | 26638-19-7 | | 1 | 0 | 0 | 0 |
| Dichlorosilane | 2819 | 4109-96-0 | | | 1 | 0 | 0 | 1 |
| Dicyamideamine | 2869 | | | | 1 | 1 | 0 | 0 |
| Dicyclopentadiene | 2865 | 77-73-6 | | | 2 | 0 | 0 | 0 |
| Diesel Fuel | 2911 | 68334-30-5 | | | 4 | 2 | 0 | 3 |
| Diethyl Aluminum Chloride | 2819 | 96-10-6 | | | 1 | 0 | 0 | 0 |
| Diethyl Carbonate | 2869 | 105-58-8 | | | 1 | 0 | 0 | 0 |
| Diethyl Chloroformate | 2869 | | | | 1 | 0 | 0 | 0 |
| Diethyl Ether | 2869 | 60-29-7 | | | 2 | 0 | 0 | 0 |
| Diethylamine | 2869 | 109-89-7 | | | 2 | 1 | 0 | 0 |
| Diethylene Triamine | 2869 | 111-40-0 | | | 1 | 0 | 0 | 0 |
| Diethylmetriamine | 2869 | | | | 1 | 0 | 0 | 0 |
| Difluoromethane | 2869 | 75-10-5 | | | 1 | 0 | 0 | 0 |
| Diisobutylamine | 2869 | 110-96-3 | | | 1 | 0 | 0 | 1 |
| Diisobutylene | 2869 | 25167-70-8 | | | 1 | 0 | 0 | 0 |
| Diisononyl Adipate | 2869 | 33703-08-1 | | | 1 | 0 | 0 | 0 |
| Diisopropenol Amine | 2869 | | | | 1 | 0 | 0 | 0 |
| Diisopropyl Ether | 2869 | 108-20-3 | | | 1 | 0 | 0 | 0 |
| Dimethyl Carbonate | 2869 | 616-38-6 | | | 2 | 0 | 0 | 0 |
| Dimethyl Ether | 2869 | 115-10-6 | | | 2 | 0 | 0 | 0 |
| Dimethyl Ketone | 2869 | 67-64-1 | | | 1 | 0 | 0 | 0 |
| Dimethyl Sulfate | 2869 | 77-78-1 | | | 1 | 0 | 0 | 0 |
| Dimethyl Sulfide | 2869 | 75-18-3 | | | 1 | 0 | 0 | 1 |
| Dimethyl Sulfoxide | 2869 | 67-68-5 | | | 2 | 1 | 0 | 1 |
| Dimethylamine | 2869 | 124-40-3 | | | 6 | 3 | 0 | 3 |
| Dimethylate | 2869 | | | | 1 | 0 | 0 | 0 |
| Dimethylester | 2869 | | | | 1 | 0 | 0 | 0 |
| Dinitrotoluene | 2865 | 25321-14-6 | | | 1 | 0 | 0 | 0 |
| Dioctyl Phthalate | 2865 | 117-81-7 | 117-84-0 | | 1 | 0 | 0 | 0 |
| Diphenylmethane Diisocyanate | 2865 | 101-68-8 | 26447-40-5 | | 1 | 0 | 0 | 1 |
| Diphenyloxazole | 2865 | 92-71-7 | | | 1 | 1 | 0 | 1 |
| Dipropylene Glycol Methyl Ethe | 2869 | 34590-94-8 | | | 1 | 0 | 0 | 0 |
| Disulfide | ---- | | | | 2 | 0 | 0 | 0 |
| Dodecylbenzene Sulfonic Acid | 2865 | 11067-81-5 | 27176-87-0 | | 1 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Dodecylbenzene/Sulfuric Acid | 2865 | 123-01-3 | 7664-93-9 | | 1 | 0 | 0 | 0 |
| Dual 8E | 2879 | 51218-45-2 | | | 1 | 0 | 0 | 0 |
| Dual/Bladex | 2879 | 757-58-4 | 21725-46-2 | 51218-45-2 | 1 | 0 | 0 | 0 |
| Endosulfan | 2879 | 115-29-7 | 33213-65-9 | | 1 | 1 | 0 | 1 |
| Epichlorohydrin | 2869 | 106-89-8 | | | 2 | 0 | 0 | 0 |
| Epoxy Resin | 2821 | | | | 2 | 1 | 0 | 0 |
| Ethanol Benzene | 2865 | 64-17-5 | 71-43-2 | | 1 | 0 | 0 | 0 |
| Ether | 2869 | 60-29-7 | | | 1 | 0 | 0 | 0 |
| Ethyl Acetate | 2869 | 141-78-6 | | | 4 | 0 | 1 | 0 |
| Ethyl Acrylate | 2869 | 140-88-5 | | | 18 | 3 | 0 | 1 |
| Ethyl Alcohol | 2869 | 64-17-5 | | | 10 | 3 | 1 | 1 |
| Ethyl Benzene | 2865 | 100-41-4 | | | 3 | 0 | 0 | 0 |
| Ethyl Chloride | 2869 | 75-00-3 | | | 4 | 0 | 0 | 0 |
| Ethyl Chloroformate | 2869 | 541-41-3 | | | 2 | 0 | 0 | 0 |
| Ethyl Ether | 2869 | 60-29-7 | | | 3 | 0 | 0 | 0 |
| Ethyl Foaming Agent "B" | 2899 | | | | 1 | 0 | 0 | 0 |
| Ethyl Hexanol | 2869 | 104-76-7 | | | 1 | 0 | 0 | 0 |
| Ethyl Mercaptan | 2869 | 75-08-1 | | | 3 | 0 | 0 | 1 |
| Ethyl Parathion | 2879 | 56-38-2 | | | 1 | 0 | 0 | 0 |
| Ethylamine | 2869 | 75-04-7 | | | 2 | 1 | 1 | 0 |
| Ethylene | 2869 | 74-85-1 | | | 42 | 1 | 1 | 1 |
| Ethylene Chloride | 2869 | 107-06-2 | | | 2 | 1 | 0 | 1 |
| Ethylene Diamine | 2869 | 107-15-3 | | | 8 | 0 | 0 | 2 |
| Ethylene Diamine Tetraacetic | 2869 | 60-00-4 | | | 1 | 0 | 0 | 0 |
| Ethylene Dibromide | 2869 | 106-93-4 | | | 1 | 0 | 0 | 0 |
| Ethylene Dichloride | 2869 | 107-06-2 | | | 26 | 0 | 0 | 0 |
| Ethylene Dichloride/VC | 2869 | 106-93-4 | 75-01-4 | | 1 | 0 | 0 | 0 |
| Ethylene Glycol | 2869 | 107-21-1 | | | 6 | 0 | 0 | 0 |
| Ethylene Glycol Monohexylether | 2869 | 112-25-4 | | | 1 | 0 | 0 | 0 |
| Ethylene Oxide | 2869 | 75-21-8 | | | 27 | 2 | 0 | 4 |
| Explosives | 2892 | | | | 5 | 3 | 3 | 2 |
| Ferric Chloride | 2819 | 7705-08-0 | | | 7 | 2 | 0 | 2 |
| Ferric Sulfate | 2819 | 10028-22-5 | | | 1 | 0 | 0 | 0 |
| Fertilizer | 2870 | | | | 29 | 4 | 0 | 3 |
| Fertilizer/Pesticide | 2870 | | | | 1 | 0 | 0 | 0 |
| Fireworks | 2892 | | | | 1 | 1 | 1 | 1 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Flammable Chemicals | 2860 | | | | 1 | 1 | 0 | 0 |
| Flammable Gas | 2860 | | | | 2 | 0 | 0 | 0 |
| Flammable Liquid | 2860 | | | | 4 | 2 | 1 | 2 |
| Flammable Material | 2860 | | | | 1 | 1 | 0 | 0 |
| Flammable Oil | 2911 | | | | 1 | 0 | 0 | 1 |
| Flammable Product | 2860 | | | | 4 | 0 | 0 | 0 |
| Flammable Resin | 2821 | | | | 1 | 0 | 0 | 0 |
| Flammable Waste | ---- | | | | 1 | 0 | 0 | 0 |
| Flue Dust | ---- | 67711-90-4 | | | 1 | 1 | 0 | 0 |
| Fluoride | 2819 | 16984-48-8 | | | 1 | 0 | 0 | 0 |
| Fluorine | 2819 | 7782-41-4 | | | 1 | 0 | 0 | 0 |
| Fluorosulfonic Acid | 2819 | 7789-21-1 | | | 1 | 0 | 0 | 1 |
| Fly Ash | ---- | | | | 1 | 0 | 0 | 0 |
| Formaldehyde | 2869 | 50-00-0 | | | 15 | 2 | 0 | 3 |
| Formic Acid | 2869 | 64-18-6 | | | 1 | 0 | 0 | 0 |
| Freon | 2869 | 75-45-6 | 11126-05-9 | | 3 | 2 | 0 | 2 |
| Freon 12 | 2869 | 75-71-8 | | | 1 | 0 | 0 | 0 |
| Fuel | 2911 | | | | 2 | 1 | 1 | 1 |
| Fuel Oil | 2911 | | | | 5 | 2 | 0 | 1 |
| Fumaric Acid | 2869 | 110-17-8 | | | 1 | 0 | 0 | 0 |
| Fungicides | 2879 | | | | 1 | 0 | 0 | 1 |
| Furadan | 2879 | 1563-66-2 | | | 3 | 0 | 0 | 1 |
| Furadan - 10G - Granuale | 2879 | 1563-66-2 | | | 1 | 0 | 0 | 0 |
| Furan | 2865 | 110-00-9 | | | 1 | 0 | 0 | 0 |
| Furfural | 2865 | 98-01-1 | | | 2 | 0 | 0 | 0 |
| Gasoline | 2911 | 8006-61-9 | | | 17 | 10 | 6 | 8 |
| Gluconic Acid | 2869 | 526-95-4 | 133-42-6 | | 1 | 0 | 0 | 0 |
| Grain Liquor | 2869 | | | | 1 | 0 | 0 | 1 |
| Hazardous Waste | ---- | | | | 5 | 2 | 0 | 0 |
| Hazardous Waste Acid | ---- | | | | 1 | 0 | 0 | 0 |
| Heating Oil | 2911 | | | | 1 | 0 | 0 | 1 |
| Heavy Metals Sludge | ---- | | | | 1 | 0 | 0 | 1 |
| Heptane | 2869 | 142-82-5 | | | 1 | 0 | 0 | 1 |
| Heptanol Ketone | 2869 | | | | 1 | 0 | 0 | 0 |
| Herbicide | 2879 | | | | 9 | 2 | 0 | 1 |
| Herbicide/Fertilizer | 2879 | | | | 1 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Hexachlorobenzene | 2865 | 118-74-1 | | | 1 | 0 | 0 | 0 |
| Hexachlorobutadiene | 2869 | 87-68-3 | | | 1 | 0 | 0 | 0 |
| Hexachlorocyclopentadiene | 2865 | 77-47-4 | | | 1 | 1 | 0 | 0 |
| Hexadiene | 2869 | 592-42-7 | 42296-74-2 | | 1 | 0 | 0 | 0 |
| Hexadiene/Hydrocarbons | 2869 | 592-42-7 | 42296-74-2 | | 1 | 0 | 0 | 0 |
| Hexamine | 2869 | 100-97-0 | | | 1 | 0 | 0 | 0 |
| Hexane | 2869 | 110-54-3 | | | 19 | 3 | 1 | 1 |
| Hexane/Propylene | 2869 | 110-54-3 | 115-07-1 | | 1 | 0 | 0 | 0 |
| Hexylethyldichloride | 2869 | | | | 1 | 0 | 0 | 0 |
| Hexylmethylamine | 2869 | 35161-70-7 | | | 1 | 0 | 0 | 0 |
| Hydrazine | 2869 | 302-01-2 | | | 2 | 0 | 0 | 0 |
| Hydrobromic Acid | 2819 | 10035-10-6 | | | 1 | 1 | 0 | 1 |
| Hydrocarbon/Vinyl | 2860 | | | | 1 | 0 | 0 | 0 |
| Hydrocarbons | 2860 | | | | 18 | 4 | 3 | 2 |
| Hydrocarbons/Solvents | 2860 | | | | 1 | 0 | 0 | 0 |
| Hydrochloric Acid | 2819 | 7647-01-0 | | | 130 | 26 | 0 | 28 |
| Hydrofluoric Acid | 2819 | 7664-39-3 | | | 11 | 1 | 0 | 1 |
| Hydrofluosilicic Acid | 2819 | 16961-83-4 | | | 1 | 0 | 0 | 0 |
| Hydrogen | 2813 | 1333-74-0 | | | 8 | 2 | 0 | 4 |
| Hydrogen Bromide | 2819 | 10035-10-6 | | | 1 | 0 | 0 | 1 |
| Hydrogen Chloride | 2819 | 7647-01-0 | | | 9 | 0 | 0 | 0 |
| Hydrogen Cyanide | 2819 | 74-90-8 | 24993-07-5 | | 12 | 2 | 0 | 3 |
| Hydrogen Fluoride | 2819 | 7664-39-3 | | | 4 | 1 | 0 | 2 |
| Hydrogen Peroxide | 2819 | 7722-84-1 | | | 7 | 0 | 0 | 0 |
| Hydrogen Sulfide | 2819 | 7783-06-4 | | | 52 | 5 | 2 | 5 |
| Hydrogen/Nitrogen | 2813 | 1333-74-0 | 7727-37-9 | | 1 | 1 | 0 | 0 |
| Hydroxide | 2810 | 1310-73-2 | | | 1 | 0 | 0 | 0 |
| Hydroxylethyl Acrylate | 2821 | 818-61-1 | | | 1 | 0 | 0 | 0 |
| Hypochlorite | 2819 | 7778-66-7 | | | 2 | 1 | 0 | 1 |
| Ink Base | 2851 | | | | 1 | 0 | 0 | 0 |
| Ink Solvents | 2851 | | | | 1 | 0 | 0 | 0 |
| Insecticide | 2879 | | | | 7 | 2 | 0 | 0 |
| Insecticides | 2879 | | | | 1 | 0 | 0 | 0 |
| Iron | 3300 | 7439-89-6 | | | 1 | 0 | 0 | 0 |
| Iso-A-Propylamine | 2869 | 75-31-0 | | | 1 | 0 | 0 | 0 |
| Iso-Phthalonitrile | 2865 | 626-17-5 | | | 1 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Isobutane | 2869 | 75-28-5 | | | 6 | 1 | 0 | 2 |
| Isobutyl Acetate | 2869 | 110-19-0 | | | 1 | 0 | 0 | 0 |
| Isobutylene | 2869 | 75-28-5 | 115-11-7 | | 1 | 0 | 0 | 0 |
| Isocyanate | 2865 | 71000-82-3 | | | 1 | 0 | 0 | 0 |
| Isoparaffinic Hydrocarbon | 2869 | | | | 1 | 0 | 0 | 0 |
| Isopentane | 2869 | 78-78-4 | | | 2 | 0 | 0 | 0 |
| Isoprene | 2869 | 78-79-5 | | | 6 | 0 | 0 | 0 |
| Isopropyl Acetate | 2869 | 108-21-4 | | | 4 | 1 | 0 | 0 |
| Isopropyl Alcohol | 2869 | 67-63-0 | | | 5 | 1 | 1 | 2 |
| Isopropyl Chloride | 2869 | 75-29-6 | | | 1 | 0 | 0 | 0 |
| Jet Fuel | 2911 | | | | 1 | 0 | 0 | 0 |
| Kelthane 35 | 2879 | 115-32-2 | | | 1 | 1 | 0 | 0 |
| Kerosene | 2911 | 8008-20-6 | 70892-10-3 | | 6 | 0 | 0 | 2 |
| Kerosene/Pesticide | 2911 | 8008-20-6 | | | 1 | 0 | 0 | 0 |
| Lacquer | 2851 | | | | 3 | 3 | 2 | 1 |
| Lacquer Base | 2851 | | | | 1 | 0 | 0 | 0 |
| Lactic Acid | 2869 | 50-21-5 | | | 1 | 0 | 0 | 0 |
| Lasso | 2879 | 15972-60-8 | | | 9 | 0 | 0 | 0 |
| Lasso Atrazine | 2879 | 15972-60-8 | 1912-24-9 | | 1 | 0 | 0 | 0 |
| Latex | 2821 | 9016-00-6 | | | 1 | 0 | 0 | 0 |
| Lead | 3300 | 7437-92-1 | | | 4 | 0 | 0 | 1 |
| Lead Acid Batteries | 2899 | | | | 1 | 1 | 0 | 0 |
| Lead Chromate | 2819 | 7758-97-6 | | | 1 | 0 | 0 | 0 |
| Lead Oxide | 2819 | 1309-60-0 | 1314-41-6 | 1317-36-8 | 2 | 0 | 0 | 0 |
| Lead Styphnate | 2819 | 15245-44-0 | | | 2 | 0 | 0 | 1 |
| Lead Sulfide | 2819 | 1314-87-0 | 12179-39-4 | | 1 | 0 | 0 | 0 |
| Light Hydrocarbons | 2911 | | | | 1 | 1 | 1 | 0 |
| Light Oil | 2911 | | | | 1 | 1 | 1 | 0 |
| Lime | 2812 | 1305-78-8 | | | 2 | 1 | 0 | 0 |
| Lindane | 2879 | 58-89-9 | 608-73-1 | | 1 | 0 | 0 | 1 |
| Lindane/Malathion | 2879 | 58-89-9 | 608-73-1 | 121-75-5 | 1 | 0 | 0 | 0 |
| Liquefied Natural Gas | 2911 | 64741-48-6 | | | 1 | 0 | 0 | 0 |
| Liquid Dye | 2816 | | | | 1 | 0 | 0 | 0 |
| Liquid Hydrogen | 2813 | 1333-74-0 | | | 1 | 0 | 0 | 0 |
| Liquid Nitrogen | 2813 | 7727-37-9 | | | 4 | 1 | 0 | 0 |
| Liquid Oxygen | 2813 | 7782-44-7 | | | 4 | 0 | 0 | 1 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Liquid Waste | ---- | | | | 1 | 0 | 0 | 0 |
| Lithium Hydride | 2819 | 7580-67-8 | | | 1 | 1 | 0 | 0 |
| Lorsban | 2879 | 2921-88-2 | | | 1 | 0 | 0 | 0 |
| M-Xylene | 2865 | 108-38-3 | | | 4 | 1 | 0 | 0 |
| MC 800 | ---- | | | | 2 | 0 | 0 | 0 |
| Magnesium | 3300 | 7439-95-4 | | | 4 | 1 | 1 | 2 |
| Magnesium Chloride | 2819 | 7786-30-3 | 7791-18-6 | 15230-53-2 | 1 | 0 | 0 | 0 |
| Magnesium Salt Slurry Sulfinat | 2819 | | | | 1 | 0 | 0 | 1 |
| Malathion | 2879 | 121-75-5 | | | 9 | 3 | 1 | 2 |
| Maleic Anhydride | 2865 | 108-31-6 | | | 2 | 1 | 1 | 0 |
| Melathyone | 2879 | 121-75-5 | | | 1 | 1 | 0 | 0 |
| Mercaptan | 2869 | | | | 8 | 2 | 0 | 0 |
| Mercury | 2819 | 7439-97-6 | | | 5 | 0 | 0 | 0 |
| Mereacrylic Acid | ---- | | | | 1 | 0 | 0 | 0 |
| Mesityl Oxide | 2869 | 141-79-7 | | | 1 | 1 | 0 | 0 |
| Metabisulfate | 2819 | | | | 1 | 1 | 0 | 0 |
| Metacresol | 2865 | 108-39-4 | | | 1 | 0 | 0 | 0 |
| Methaldeheyde | 2869 | 50-00-0 | | | 1 | 0 | 0 | 0 |
| Methane | 2869 | 74-82-8 | | | 2 | 1 | 1 | 1 |
| Methane Diisocyanate | 2869 | | | | 1 | 1 | 0 | 0 |
| Methyl Acrylate | 2821 | 96-33-3 | | | 5 | 4 | 2 | 2 |
| Methyl Alcohol | 2869 | 67-56-1 | | | 34 | 2 | 0 | 4 |
| Methyl Bis Acrylamide | 2821 | | | | 1 | 0 | 0 | 0 |
| Methyl Bromide | 2869 | 74-83-9 | 16519-97-4 | | 5 | 3 | 1 | 5 |
| Methyl Chloride | 2869 | 74-87-3 | | | 89 | 0 | 0 | 0 |
| Methyl Chloroform | 2869 | 71-55-6 | 25323-89-1 | | 2 | 1 | 0 | 1 |
| Methyl Chloroformate | 2869 | 79-22-1 | | | 2 | 0 | 0 | 0 |
| Methyl Ethyl Ketone | 2869 | 78-93-3 | | | 23 | 2 | 3 | 2 |
| Methyl Ethyl Ketone Peroxide | 2869 | 1338-23-4 | | | 1 | 0 | 0 | 0 |
| Methyl Iodide | 2819 | 74-88-4 | | | 4 | 1 | 0 | 0 |
| Methyl Isobutyl Ketone | 2869 | 105-44-2 | 108-10-1 | | 4 | 0 | 0 | 0 |
| Methyl Isocyanate | 2869 | 624-83-9 | | | 1 | 1 | 0 | 1 |
| Methyl Isocyanite | 2869 | 624-83-9 | | | 1 | 0 | 0 | 0 |
| Methyl Mercaptan | 2869 | 74-93-1 | | | 8 | 2 | 0 | 0 |
| Methyl Methacrylate | 2821 | 80-62-6 | | | 7 | 2 | 0 | 2 |
| Methyl Parathion | 2879 | 298-00-0 | | | 1 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Methyl Thiazol | 2869 | 3581-87-1 | 693-95-8 | 3581-89-3 | 1 | 0 | 0 | 0 |
| Methyl-Tert-Butyl Ether | 2869 | 1634-04-4 | | | 1 | 0 | 0 | 0 |
| Methyl-tert-Butyl Ether | 2869 | 1634-04-4 | | | 1 | 0 | 0 | 0 |
| Methylamine | 2869 | 74-89-5 | | | 1 | 0 | 0 | 0 |
| Methylene Chloride | 2869 | 75-09-2 | | | 15 | 2 | 0 | 1 |
| Methylmercaptan | 2869 | 74-93-1 | | | 3 | 1 | 0 | 0 |
| Mineral Oil | 2911 | 8012-95-1 | 8020-83-5 | 8042-47-5 | 1 | 0 | 0 | 0 |
| Mineral Spirits | 2911 | 8030-30-6 | 8032-32-4 | | 3 | 0 | 0 | 0 |
| Mixed Acids | 2819 | | | | 1 | 0 | 0 | 0 |
| Mono Isobutyl Amine | 2869 | 78-81-9 | | | 1 | 0 | 0 | 0 |
| Monoaluminum Phosphate | 2819 | 7784-30-7 | | | 1 | 0 | 0 | 0 |
| Monoammonium Nitrate | 2873 | 6484-52-2 | | | 1 | 0 | 0 | 0 |
| Monochlorobenzene | 2865 | 108-90-7 | | | 6 | 2 | 0 | 1 |
| Monochlorofluoromethane | 2869 | 593-70-4 | | | 1 | 0 | 0 | 0 |
| Monoethanolamine | 2869 | 141-43-5 | | | 1 | 1 | 0 | 1 |
| Monovinylacetylene | 2869 | 689-97-4 | | | 1 | 0 | 0 | 0 |
| Morphine | 2833 | 57-27-2 | | | 1 | 1 | 0 | 0 |
| Murethane Insulation | 2821 | 9009-54-5 | | | 1 | 0 | 0 | 1 |
| Muriatic Acid | 2819 | 7647-01-0 | | | 6 | 2 | 0 | 3 |
| N-Butane | 2869 | 106-97-8 | | | 1 | 0 | 0 | 0 |
| N-Butyl Alcohol | 2869 | 71-36-3 | | | 1 | 1 | 1 | 1 |
| N-Octyl-Mercaptan | 2869 | 111-88-6 | | | 2 | 0 | 0 | 0 |
| N-Propanol | 2869 | 71-23-8 | | | 1 | 0 | 0 | 0 |
| Nalco 1370 | 2800 | | | | 1 | 0 | 0 | 0 |
| Nalco 225 | 2800 | | | | 1 | 0 | 0 | 0 |
| Nalco 324 | 2800 | | | | 1 | 1 | 0 | 0 |
| Naphtha | 2865 | 8007-45-2 | 8030-30-6 | 8052-41-3 | 16 | 3 | 0 | 3 |
| Naphtha Asphalt | 2865 | | | | 1 | 1 | 1 | 0 |
| Naphtha Spirits | 2865 | 8007-45-2 | 8030-30-6 | 8052-41-3 | 1 | 0 | 0 | 0 |
| Naphtha/Xylene/VMP | 2865 | 106-42-3 | 1330-20-7 | 8007-45-2 | 1 | 0 | 0 | 0 |
| Naphthalene | 2865 | 91-20-3 | 1146-65-2 | | 4 | 0 | 0 | 0 |
| Natural Gas | 2911 | 8006-14-2 | 64741-84-6 | | 4 | 0 | 0 | 2 |
| Nickel Nitrate | 2819 | 13138-45-9 | | | 1 | 0 | 0 | 0 |
| Nickel Plating Solution | 2819 | | | | 2 | 0 | 0 | 0 |
| Nickel Sulfate | 2819 | 7786-81-4 | | | 1 | 0 | 0 | 1 |
| Nickel/Molybdenum/H2O Solution | 3300 | 7440-02-0 | 7439-98-7 | 7732-18-5 | 1 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Nitric Acid | 2873 | 7697-37-2 | | | 43 | 7 | 1 | 9 |
| Nitric Oxide | 2819 | 10102-43-9 | | | 23 | 0 | 0 | 0 |
| Nitric/Chromic Acids | 2819 | 7697-37-2 | 1333-82-0 | 7738-94-5 | 1 | 0 | 0 | 0 |
| Nitric/Sulfuric Acids | 2819 | 7697-37-2 | 7664-93-9 | | 1 | 0 | 0 | 0 |
| Nitrobenzene | 2865 | 98-95-3 | | | 2 | 0 | 0 | 0 |
| Nitrocellulose | 2821 | 9004-70-0 | | | 2 | 2 | 1 | 0 |
| Nitrocellulose Film | 2821 | 9004-70-0 | | | 1 | 0 | 0 | 0 |
| Nitrochlorobenzene | 2865 | 25167-93-5 | | | 1 | 0 | 0 | 1 |
| Nitrodiphenylamine | 2865 | 119-75-5 | 34344-88-2 | | 1 | 0 | 0 | 0 |
| Nitrogen | 2813 | 7727-37-9 | | | 8 | 1 | 0 | 1 |
| Nitrogen Fertilizer | 2873 | | | | 38 | 2 | 0 | 0 |
| Nitrogen Fertilizer/Lasso | 2873 | 15972-60-8 | | | 2 | 0 | 0 | 0 |
| Nitrogen Oxide | 2819 | 10024-97-2 | 10102-44-0 | 11104-93-1 | 1 | 0 | 0 | 0 |
| Nitrogen/Atrazine | 2879 | 1912-24-9 | | | 2 | 0 | 0 | 1 |
| Nitrogen/Xylene | 2865 | 7727-37-9 | 1330-20-7 | | 1 | 0 | 0 | 0 |
| Nitrous Oxide | 2813 | 10024-97-2 | | | 9 | 4 | 0 | 0 |
| O-Xylene | 2865 | 95-47-6 | | | 1 | 0 | 0 | 0 |
| Octyl Alcohol | 2869 | 104-76-7 | 111-87-5 | | 2 | 1 | 0 | 1 |
| Oil | 2911 | | | | 10 | 4 | 1 | 2 |
| Organic Phosphate | 2869 | | | | 1 | 0 | 0 | 0 |
| Ortho-Chlorophenol | 2865 | 95-57-8 | | | 1 | 0 | 0 | 0 |
| Ortho-Nitrochlorobenzene | 2865 | 88-73-3 | | | 1 | 1 | 0 | 1 |
| Ortho-Phosphoric Acid | 2874 | 7664-38-2 | | | 1 | 0 | 0 | 0 |
| Orthoronitro Toluene | 2865 | 88-72-2 | | | 1 | 0 | 0 | 0 |
| Oxide Catalyst | 2819 | | | | 2 | 0 | 0 | 0 |
| Oxidizers | 2890 | | | | 2 | 2 | 0 | 0 |
| Oxygen | 2813 | 7782-44-7 | | | 3 | 1 | 1 | 0 |
| Paint | 2851 | | | | 10 | 2 | 0 | 0 |
| Paint Hazardous Products | 2851 | | | | 1 | 0 | 0 | 1 |
| Paint Resin | 2851 | | | | 1 | 0 | 0 | 0 |
| Paint Thinner | 2851 | | | | 2 | 0 | 0 | 0 |
| Para-Cresol | 2865 | 106-44-5 | | | 1 | 0 | 0 | 1 |
| Paracymene | 2865 | 99-87-6 | | | 1 | 0 | 0 | 0 |
| Paraformaldehyde | 2869 | 110-88-3 | 9002-81-7 | 30525-89-4 | 1 | 0 | 0 | 0 |
| Parahydromercluribenzate | 2865 | | | | 1 | 0 | 0 | 0 |
| Paraquat | 2879 | 1910-42-5 | 4685-14-7 | | 5 | 3 | 0 | 4 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Parathion | 2879 | 56-38-2 | | | 4 | 2 | 0 | 2 |
| Pentachlorophenol | 2865 | 87-86-5 | | | 6 | 2 | 0 | 1 |
| Pentane | 2869 | 109-66-0 | | | 4 | 1 | 0 | 1 |
| Perchloric Acid | 2819 | 7601-90-3 | | | 1 | 1 | 0 | 0 |
| Peroxide | 2819 | | | | 3 | 1 | 0 | 0 |
| Pesticide | 2879 | | | | 13 | 4 | 0 | 4 |
| Pesticides | 2879 | | | | 1 | 1 | 0 | 1 |
| Petroleum | 2911 | 8002-05-9 | | | 1 | 0 | 0 | 0 |
| Petroleum Distillate | 2911 | 8002-05-9 | | | 2 | 0 | 0 | 0 |
| Petroleum Ether | 2911 | 8030-30-6 | 8032-32-4 | | 1 | 0 | 0 | 0 |
| Petroleum Fluids | 2911 | | | | 1 | 0 | 0 | 1 |
| Petroleum Gas | 2911 | | | | 1 | 0 | 0 | 0 |
| Petroleum Products | 2911 | | | | 5 | 1 | 0 | 2 |
| Petroleum Refining Slurry | 2911 | | | | 1 | 0 | 0 | 0 |
| Phenol | 2865 | 108-95-2 | | | 11 | 1 | 0 | 2 |
| Phenol Acetone | 2865 | 35238-34-7 | 103-79-7 | | 1 | 0 | 0 | 0 |
| Phenol Formaldehyde | 2865 | 9003-35-4 | | | 5 | 0 | 0 | 0 |
| Phenol Mercury Acetate | 2865 | | | | 1 | 1 | 0 | 0 |
| Phenolic Resin | 2821 | | | | 2 | 0 | 0 | 0 |
| Phenyl Mercuric Acetate | 2874 | 62-38-4 | | | 1 | 0 | 0 | 0 |
| Phenyldichloroarsine | 2865 | 696-28-6 | | | 1 | 0 | 0 | 0 |
| Phosgene | 2869 | 75-44-5 | | | 14 | 6 | 2 | 4 |
| Phosphate Base Fertilizer | 2874 | | | | 1 | 0 | 0 | 0 |
| Phosphate/Phostoxin | 2819 | 14265-44-2 | 20859-73-8 | | 1 | 0 | 0 | 0 |
| Phosphine | 2819 | 7803-51-2 | | | 2 | 1 | 0 | 1 |
| Phosphoric Acid | 2874 | 7664-38-2 | 14265-44-2 | | 27 | 4 | 0 | 4 |
| Phosphoric Trichloride | 2819 | 10025-87-3 | | | 1 | 1 | 0 | 1 |
| Phosphorus | 2819 | 7723-14-0 | | | 7 | 1 | 1 | 1 |
| Phosphorus Chloridate Othedate | 2819 | | | | 1 | 0 | 0 | 0 |
| Phosphorus Oxychloride | 2819 | 10025-87-3 | | | 3 | 2 | 0 | 1 |
| Phosphorus Pentasulfide | 2819 | 1314-80-3 | | | 3 | 0 | 0 | 2 |
| Phosphorus Trichlorate | 2819 | | | | 1 | 0 | 0 | 0 |
| Phosphorus Trichloride | 2819 | 7719-12-2 | | | 1 | 0 | 0 | 0 |
| Phostoxin | 2819 | 20859-73-8 | | | 1 | 0 | 0 | 0 |
| Phthalic Anhydride | 2865 | 85-44-9 | | | 5 | 3 | 0 | 1 |
| Pitch | 2865 | 8007-45-2 | 61789-60-4 | 65996-93-2 | 2 | 0 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Plastic | 2821 | | | | 2 | 0 | 0 | 1 |
| Plastic Resin | 2821 | | | | 1 | 0 | 0 | 0 |
| Plating Solution | ---- | | | | 1 | 0 | 0 | 0 |
| Poison | ---- | | | | 1 | 0 | 0 | 1 |
| Polychlorinated Biphenyls | 2821 | 2051-24-3 | 11096-82-5 | 11097-69-1 | 189 | 14 | 0 | 4 |
| Polyester | 2821 | | | | 1 | 0 | 0 | 0 |
| Polyester Resin | 2821 | | | | 3 | 0 | 0 | 0 |
| Polyester Styrene | 2821 | 100-42-5 | | | 1 | 0 | 0 | 0 |
| Polyether | 2821 | | | | 2 | 0 | 0 | 0 |
| Polyether Polyol | 2821 | | | | 1 | 0 | 0 | 0 |
| Polyethylene | 2821 | 9002-88-4 | | | 6 | 2 | 1 | 0 |
| Polyglycol Ether | 2821 | | | | 1 | 0 | 0 | 0 |
| Polylvinyl Chloride | 2821 | 9002-86-2 | | | 1 | 0 | 0 | 0 |
| Polymeric Diphenol | 2821 | | | | 1 | 1 | 0 | 0 |
| Polyoxylene Polyol | 2821 | | | | 1 | 0 | 0 | 0 |
| Polypropylene | 2821 | 9003-07-0 | | | 10 | 2 | 1 | 1 |
| Polystyrene | 2821 | 9003-53-6 | | | 2 | 1 | 0 | 0 |
| Polystyrene Foam | 2821 | 9003-53-6 | | | 1 | 0 | 0 | 0 |
| Polyurethane | 2821 | 68400-67-9 | | | 1 | 0 | 0 | 0 |
| Polyurethane Binder | 2821 | | | | 1 | 0 | 1 | 0 |
| Polyurethane Foam | 2821 | 9009-54-5 | | | 1 | 0 | 0 | 0 |
| Polyvinyl Acetate Emulsion | 2821 | 9003-20-7 | | | 1 | 0 | 0 | 0 |
| Polyvinyl Chloride | 2821 | 9002-86-2 | | | 4 | 1 | 1 | 2 |
| Potash | 2812 | 584-08-7 | 12136-45-7 | | 4 | 0 | 0 | 0 |
| Potassium Carbonate | 2812 | 584-08-7 | | | 2 | 0 | 0 | 0 |
| Potassium Chloride | 2819 | 7447-40-7 | 24359-76-0 | | 1 | 0 | 0 | 0 |
| Potassium Chromate | 2819 | 7789-00-6 | | | 1 | 0 | 0 | 0 |
| Potassium Cyanide | 2819 | 151-50-8 | | | 1 | 0 | 0 | 0 |
| Potassium Ferricyanide | 2819 | 13746-66-2 | | | 2 | 2 | 0 | 2 |
| Potassium Ferrocyanide | 2819 | 13746-66-2 | | | 2 | 2 | 0 | 2 |
| Potassium Hydroxide | 2812 | 1310-58-3 | | | 8 | 1 | 0 | 1 |
| Potassium Nitrate | 2819 | 7757-79-1 | | | 2 | 0 | 0 | 0 |
| Potassium Permanganate | 2819 | 7722-64-7 | | | 3 | 0 | 0 | 1 |
| Printing Chemicals | 2893 | | | | 1 | 0 | 0 | 0 |
| Printing Ink | 2893 | | | | 1 | 0 | 0 | 0 |
| Propane | 2911 | 74-98-6 | | | 15 | 5 | 1 | 5 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Propargite | ---- | 2312-35-8 | | | 1 | 0 | 0 | 0 |
| Propargyl Alcohol | 2869 | 107-19-7 | | | 1 | 0 | 0 | 0 |
| Propionaldehyde | 2869 | 123-38-6 | | | 1 | 0 | 0 | 0 |
| Propyl Alcohol | 2869 | 71-23-8 | | | 1 | 0 | 0 | 0 |
| Propyl Mercaptan | 2869 | 107-03-9 | | | 1 | 1 | 0 | 0 |
| Propylene | 2869 | 115-07-1 | | | 14 | 1 | 1 | 2 |
| Propylene Alcohol | 2869 | 107-18-6 | | | 1 | 0 | 0 | 0 |
| Propylene Dichloride | 2869 | 78-87-5 | 536-54-2 | 26638-19-7 | 1 | 1 | 0 | 1 |
| Propylene Glycol | 2869 | 57-55-6 | | | 4 | 0 | 0 | 1 |
| Propylene Mercaptan | 2869 | | | | 1 | 0 | 0 | 0 |
| Propylene Oxide | 2869 | 75-56-9 | | | 7 | 1 | 0 | 1 |
| Propylene Tetramer | 2869 | 6842-15-5 | | | 1 | 0 | 0 | 0 |
| Propylene/Hexcone/Propane | 2869 | 115-07-1 | 74-98-6 | | 1 | 0 | 0 | 0 |
| Pulp Mill Waste | 2611 | | | | 1 | 0 | 0 | 0 |
| Pyrethrim | 2879 | 8003-34-7 | 121-29-9 | | 1 | 0 | 0 | 1 |
| Pyrethrin | 2879 | 8003-34-7 | 121-29-9 | | 1 | 1 | 0 | 1 |
| Pyridine | 2865 | 110-86-1 | | | 2 | 0 | 0 | 2 |
| Quicklime | 2812 | 1305-78-8 | | | 1 | 0 | 0 | 0 |
| Refinery Gases | 2911 | 68607-11-4 | | | 1 | 0 | 0 | 0 |
| Refinery Oil | 2911 | | | | 1 | 0 | 0 | 0 |
| Refining Hydrocarbons | 2911 | | | | 1 | 0 | 0 | 0 |
| Refrigerant 22 | 2899 | 75-45-6 | | | 1 | 0 | 0 | 0 |
| Resin | 2821 | | | | 7 | 1 | 0 | 0 |
| Rhoplex Resin | 2821 | | | | 1 | 0 | 0 | 0 |
| Rhoplex-TR-470 | 2821 | | | | 1 | 0 | 0 | 0 |
| Rich Oil | 2911 | | | | 1 | 0 | 0 | 0 |
| Safety Klean 105 | 2860 | | | | 1 | 0 | 0 | 0 |
| Salicylic Acid | 2865 | 69-72-7 | | | 1 | 0 | 0 | 0 |
| Salt Water | ---- | | | | 1 | 0 | 0 | 0 |
| Satan/Aatrex | 2879 | 1912-24-9 | | | 1 | 0 | 0 | 0 |
| Sevin | 2879 | 63-25-2 | | | 1 | 0 | 0 | 0 |
| Silane | 2819 | 7803-62-5 | | | 3 | 0 | 0 | 0 |
| Silicate of Soda | 2819 | | | | 1 | 1 | 0 | 0 |
| Silicon Tetrachloride | 2819 | 10026-04-7 | | | 1 | 1 | 0 | 1 |
| Sludge | ---- | | | | 2 | 0 | 0 | 0 |
| Sodium | 3300 | 7440-23-5 | | | 1 | 1 | 0 | 0 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Sodium Bichromate | 2819 | 10588-01-9 | | | 1 | 0 | 0 | 0 |
| Sodium Bisulfate | 2819 | 7681-38-1 | | | 1 | 0 | 0 | 0 |
| Sodium Bisulfite | 2819 | 7631-90-5 | | | 3 | 0 | 0 | 0 |
| Sodium Bromate | 2819 | 7789-38-0 | | | 1 | 0 | 0 | 0 |
| Sodium Carbonate | 2812 | 144-55-8 | 497-19-8 | | 3 | 0 | 0 | 1 |
| Sodium Chlorate | 2819 | 7775-09-9 | | | 2 | 0 | 0 | 0 |
| Sodium Chlorite | 2819 | 7758-19-2 | | | 2 | 0 | 1 | 1 |
| Sodium Chromate | 2819 | 7775-11-3 | 10588-01-9 | | 3 | 0 | 0 | 0 |
| Sodium Cyanide | 2819 | 143-33-9 | 1934-75-4 | | 3 | 0 | 0 | 1 |
| Sodium Formate | 2819 | 141-53-7 | | | 1 | 0 | 0 | 1 |
| Sodium Hydrochloric Acid | 2819 | | | | 1 | 1 | 0 | 1 |
| Sodium Hydrosulfate | 2819 | 7681-38-1 | | | 4 | 1 | 0 | 1 |
| Sodium Hydrosulfide | 2819 | 7631-90-5 | 16721-80-5 | | 2 | 1 | 0 | 1 |
| Sodium Hydrosulfite | 2819 | 7631-90-5 | 7775-14-6 | | 3 | 1 | 0 | 1 |
| Sodium Hydroxide | 2812 | 1310-73-2 | | | 50 | 9 | 1 | 5 |
| Sodium Hydroxide/Chromium | 2812 | 1310-73-2 | 7440-47-3 | | 1 | 0 | 0 | 0 |
| Sodium Hydroxide/Tar | 2812 | 1310-73-2 | 8007-45-2 | | 1 | 0 | 0 | 0 |
| Sodium Hypochlorate | 2819 | 7681-52-9 | | | 4 | 0 | 0 | 0 |
| Sodium Hypochlorite | 2842 | 7681-52-9 | | | 6 | 2 | 0 | 2 |
| Sodium Nitrate | 2819 | 7631-99-4 | | | 5 | 2 | 1 | 1 |
| Sodium Nitrite | 2819 | 7632-00-0 | | | 1 | 0 | 0 | 0 |
| Sodium Permanganate | 2819 | 10101-50-5 | | | 1 | 0 | 0 | 0 |
| Sodium Sulfhydrate | 2819 | 16721-80-5 | | | 1 | 1 | 1 | 1 |
| Soduim Hydroxide | 2812 | 1310-73-2 | | | 1 | 0 | 0 | 0 |
| Solvent | 2860 | | | | 37 | 7 | 2 | 7 |
| Solvents/Corrosives | 2860 | | | | 1 | 1 | 0 | 0 |
| Specialty Oils | 2899 | | | | 1 | 1 | 1 | 0 |
| Styrene | 2865 | 100-42-5 | | | 37 | 6 | 0 | 9 |
| Styrene Tar | 2865 | | | | 1 | 0 | 0 | 0 |
| Styrofoam | 2821 | 9003-53-6 | | | 1 | 0 | 0 | 1 |
| Sulfamic Acid | 2819 | 5329-14-6 | | | 2 | 0 | 0 | 0 |
| Sulfite | 2819 | 14265-45-3 | | | 2 | 0 | 0 | 0 |
| Sulfur | 3300 | 7704-34-9 | | | 23 | 1 | 1 | 2 |
| Sulfur Chloride | 2819 | 10025-67-9 | 10545-99-0 | 12771-08-3 | 40 | 0 | 0 | 0 |
| Sulfur Dioxide | 2819 | 7746-09-5 | | | 47 | 1 | 0 | 0 |
| Sulfur Monochloride | 2819 | 10025-67-9 | 12771-08-3 | | 3 | 0 | 0 | 1 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Sulfur Trioxide | 2819 | 7446-11-9 | | | 13 | 1 | 0 | 0 |
| Sulfur Vanadium Pentoxide | 2819 | | | | 1 | 0 | 0 | 0 |
| Sulfuric Acid | 2819 | 7664-93-9 | | | 130 | 21 | 2 | 14 |
| Sulfuric Dioxide | 2819 | 7446-09-5 | | | 1 | 1 | 0 | 1 |
| Sulfuric/Nitric Acid | 2819 | 7664-93-9 | 7697-37-2 | | 1 | 0 | 0 | 0 |
| Surfactant | 2843 | | | | 1 | 0 | 0 | 0 |
| Sutan | 2879 | 2008-41-5 | | | 1 | 0 | 0 | 0 |
| Sutazine | 2879 | 8070-81-3 | | | 1 | 0 | 0 | 0 |
| Synthetic Resin Emulsion | 2821 | | | | 1 | 0 | 0 | 0 |
| Synthetic Rubber | 2822 | | | | 1 | 0 | 0 | 0 |
| T-Butyl Mercaptan | 2869 | 75-66-1 | | | 1 | 0 | 0 | 0 |
| Tallow/Alcohol/Hydrogen | 2840 | | | | 1 | 0 | 0 | 0 |
| Terephthalic Acid | 2865 | 100-21-0 | | | 1 | 0 | 0 | 0 |
| Tertiary ButylPeroxyPhthalate | 2865 | 15042-77-0 | | | 1 | 0 | 0 | 0 |
| Tertiary Butylperbenzoate | 2865 | 614-45-9 | | | 1 | 0 | 0 | 0 |
| Tetrachloroethane | 2869 | 79-34-5 | 25322-20-7 | | 3 | 0 | 0 | 0 |
| Tetrachloroethylene | 2869 | 127-18-4 | | | 15 | 2 | 0 | 1 |
| Tetraethyl Lead | 2869 | 78-00-2 | | | 4 | 1 | 0 | 1 |
| Tetrahydrocarbon | 2869 | | | | 2 | 0 | 0 | 0 |
| Tetrahydrofuran | 2869 | 109-99-9 | | | 4 | 1 | 0 | 0 |
| Tetrapotassium Phosphate | 2819 | | | | 1 | 0 | 0 | 0 |
| Thiabendazole | 2865 | 148-79-8 | | | 1 | 0 | 0 | 0 |
| Thionyl Chloride | 2819 | 7719-09-7 | | | 1 | 1 | 0 | 0 |
| Thiophene | 2865 | 110-02-1 | | | 2 | 2 | 0 | 0 |
| Thiram | 2879 | 137-26-8 | | | 1 | 1 | 0 | 0 |
| Tin Oxide | 2819 | 1332-29-2 | 12169-15-2 | 12298-99-6 | 1 | 0 | 0 | 0 |
| Tin Tetrachloride | 2819 | 7646-78-8 | | | 1 | 0 | 0 | 0 |
| Titanium | 3300 | 7440-32-6 | | | 3 | 0 | 0 | 0 |
| Titanium Dioxide | 2819 | 1317-70-0 | 1317-80-2 | 13463-67-7 | 4 | 0 | 0 | 0 |
| Titanium Tetrachloride | 2819 | 7550-45-0 | | | 10 | 0 | 0 | 1 |
| Tolad Number 249 | ---- | | | | 1 | 0 | 0 | 0 |
| Toluene | 2865 | 108-88-3 | | | 39 | 7 | 3 | 3 |
| Toluene Diisocyanate | 2865 | 584-84-9 | 26471-62-5 | | 11 | 4 | 0 | 5 |
| Toluene/Cyanoethyl Caprolactam | 2869 | 108-88-3 | 7336-15-4 | | 1 | 0 | 0 | 0 |
| Toxaphene | 2879 | 8001-35-2 | | | 2 | 0 | 0 | 1 |
| Toxaphine | 2879 | 8001-35-2 | | | 1 | 0 | 0 | 1 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Toxic Flammable Liquids | ---- | | | | 1 | 0 | 0 | 0 |
| Treflan | 2879 | 1582-09-8 | | | 1 | 0 | 0 | 0 |
| Treflan/Sencor | 2879 | 1582-09-8 | 21087-64-9 | | 1 | 0 | 0 | 0 |
| Triazole | 2865 | 37306-44-8 | | | 1 | 1 | 0 | 0 |
| Trichloride | ---- | 18434-33-8 | | | 1 | 0 | 0 | 0 |
| Trichloroethane | 2869 | 71-55-6 | 79-00-5 | 25323-89-1 | 7 | 2 | 1 | 0 |
| Trichloroethylene | 2869 | 79-01-6 | | | 7 | 1 | 0 | 1 |
| Trichloroethylene-Triazine | 2869 | 79-01-6 | 101-05-3 | 12654-97-6 | 2 | 0 | 0 | 0 |
| Trichlorophenylsilane | 2865 | 98-13-5 | | | 2 | 0 | 0 | 0 |
| Triethyl Butane | 2869 | | | | 1 | 0 | 0 | 0 |
| Triethylamine | 2869 | 121-44-8 | | | 1 | 0 | 0 | 0 |
| Triethylene Glycol | 2869 | 112-27-6 | | | 1 | 0 | 0 | 0 |
| Triethylene Glycol/ Ethanol | 2869 | 112-27-6 | 64-17-5 | | 1 | 0 | 0 | 0 |
| Trifluoromethane | 2869 | 75-46-7 | | | 1 | 0 | 0 | 0 |
| Trifluralin | 2874 | 1582-09-8 | | | 1 | 1 | 0 | 0 |
| Trimethylamine | 2869 | 75-50-3 | | | 2 | 1 | 0 | 0 |
| Turdon (Amdon 101) | 2879 | 1918-02-1 | | | 2 | 0 | 0 | 0 |
| Unknown | ---- | | | | 75 | 23 | 2 | 11 |
| Uranium | 2819 | 7440-61-1 | | | 2 | 0 | 0 | 0 |
| Uranium Hexafluoride | 2819 | 7783-81-5 | | | 4 | 1 | 0 | 0 |
| Uranium Oxide | 2819 | 1344-57-6 | 11113-93-2 | 19525-15-6 | 4 | 0 | 0 | 0 |
| Uranium Tetrafluoride | 2819 | 10049-14-6 | | | 2 | 0 | 0 | 0 |
| Urea | 2873 | 57-13-6 | | | 2 | 0 | 1 | 0 |
| Urea Ammonia Fertilizer | 2873 | | | | 1 | 0 | 0 | 0 |
| Urea Ammonium Nitrate | 2873 | | | | 5 | 0 | 0 | 0 |
| Urea Formaldehyde | 2821 | 9011-05-6 | | | 2 | 0 | 0 | 0 |
| Urethane Resin | 2821 | 9009-54-5 | | | 1 | 1 | 0 | 1 |
| VOC Gas Mixture | 2860 | | | | 1 | 0 | 0 | 0 |
| Vacuum Distillate | 2911 | | | | 1 | 1 | 1 | 0 |
| Vanadium Pentoxide | 2819 | 1314-62-1 | | | 2 | 0 | 0 | 0 |
| Vapam | 2879 | 137-42-8 | 6734-80-1 | | 1 | 0 | 0 | 0 |
| Vinyl Acetate | 2869 | 108-05-4 | | | 21 | 1 | 0 | 3 |
| Vinyl Alcohol | 2869 | 557-75-5 | | | 1 | 0 | 0 | 0 |
| Vinyl Chloride | 2869 | 75-01-4 | | | 69 | 5 | 0 | 10 |
| Vinyl Chloride Dichlor | 2869 | | | | 1 | 0 | 0 | 0 |
| Vinyl Toluene | 2821 | 25013-15-4 | | | 1 | 0 | 0 | 1 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Vinyl Toluene/Alkyd/Resin | 2821 | 25013-15-4 | | | 1 | 0 | 0 | 0 |
| Vinylidene | 2869 | 2143-69-3 | | | 1 | 0 | 0 | 0 |
| Vinylidene Chloride | 2869 | 75-35-4 | | | 9 | 0 | 0 | 0 |
| Volatile Organic Compounds | ---- | | | | 3 | 0 | 0 | 0 |
| WD-40 Oil | 2899 | 83764-86-7 | | | 1 | 0 | 0 | 1 |
| Waste Chemicals | ---- | | | | 1 | 0 | 0 | 1 |
| Waste Water | ---- | | | | 1 | 0 | 0 | 0 |
| Weedon | 2879 | 2545-59-7 | | | 2 | 0 | 0 | 0 |
| Xylene | 2865 | 106-42-3 | 1330-20-7 | | 15 | 0 | 0 | 4 |
| Xylenol | 2865 | 1300-71-6 | | | 1 | 0 | 0 | 0 |
| Zinc | 3300 | 7440-66-6 | | | 3 | 1 | 1 | 0 |
| Zinc Cyanide | 2819 | 557-21-1 | | | 1 | 1 | 0 | 0 |
| Zinc Dust | 3300 | 7440-66-6 | | | 1 | 1 | 0 | 0 |
| Zinc Oxide | 2819 | 1314-13-2 | 20431-17-8 | | 2 | 0 | 0 | 0 |
| Zinc Phosphate | 2819 | 7779-90-0 | 13566-15-9 | 13847-22-8 | 1 | 0 | 0 | 0 |
| Zinc Sulfate | 2819 | 7733-02-0 | 38899-67-1 | | 1 | 0 | 0 | 0 |
| Zirconium | 3300 | 7440-67-7 | | | 1 | 0 | 0 | 0 |
| Butene | ? | | | | 1 | 0 | 0 | 0 |
| Calcium Cilicide | ? | | | | 1 | 0 | 0 | 1 |
| Carbolic Acid | ? | | | | 2 | 1 | 1 | 1 |
| Caustic Acid | ? | | | | 1 | 0 | 0 | 0 |
| Chloroformates | ? | | | | 1 | 0 | 0 | 0 |
| Chlorosulfuric Acid | ? | | | | 1 | 0 | 0 | 0 |
| Chlorotyrisos | ? | | | | 1 | 0 | 0 | 0 |
| Chlorpyrifos | ? | | | | 1 | 0 | 0 | 0 |
| Chromatic Acid | ? | | | | 1 | 0 | 0 | 0 |
| Cypernethren | ? | | | | 1 | 1 | 0 | 1 |
| Diesel Fuel | ? | | | | 1 | 1 | 0 | 1 |
| Diethyl Methyl Phosphorothidat | ? | | | | 1 | 0 | 0 | 0 |
| Dimethyl terephthalate | ? | | | | 1 | 0 | 0 | 0 |
| Dimethylcyclohexylane | ? | | | | 1 | 0 | 0 | 0 |
| Glycerine Thermox | ? | | | | 1 | 0 | 0 | 0 |
| Hydrozene | ? | | | | 1 | 0 | 0 | 0 |
| Isopropylamine Glysophate | ? | | | | 1 | 0 | 0 | 0 |
| Mono-al Phosphatesol | ? | | | | 1 | 0 | 0 | 0 |
| Organophosphates | ? | | | | 1 | 1 | 0 | 1 |

SUMMARY OF SUBSTANCES
APPEARING IN HAZARDOUS EVENTS DATABASE

| SUBSTANCE | 4 Digit SIC | 1st CAS # | 2nd CAS # | 3rd CAS # | EVENTS: TOTAL | INJURY | FATAL | EVACUATION |
|---|---|---|---|---|---|---|---|---|
| Organosal Ineesther | ? | | | | 1 | 0 | 0 | 0 |
| Orthene | ? | | | | 1 | 0 | 0 | 0 |
| Permethane | ? | | | | 1 | 0 | 0 | 0 |
| Phenol-Melamine Formica Resin | ? | | | | 1 | 0 | 0 | 0 |
| Phosphate Acid | ? | | | | 1 | 0 | 0 | 0 |
| Phosphons | ? | | | | 2 | 0 | 0 | 0 |
| Proponic Acid | ? | | | | 1 | 0 | 0 | 0 |
| Propylene Oxide Styrene | ? | | | | 1 | 0 | 0 | 0 |
| Pydrin | ? | | | | 1 | 1 | 0 | 1 |
| Ridoline | ? | | | | 1 | 0 | 0 | 0 |
| Solvent Isoparafin | ? | | | | 1 | 0 | 0 | 0 |
| Sulfonic Acid | ? | | | | 1 | 0 | 0 | 0 |
| Thisodian | ? | | | | 1 | 1 | 0 | 0 |
| Trichlorotriazinitrion | ? | | | | 1 | 0 | 0 | 0 |

# APPENDIX D

# DATABASE SUMMARY FOR ALL EVENTS

ENCYCLOPEDIA OF DATA
(All Records)

| | No. of Records | % of Total |
|---|---|---|
| **SUBSTANCE STATE** | | |
| Solid | 179 | 2.58 |
| Liquid | 5411 | 78.10 |
| Gas | 1021 | 14.74 |
| Unknown | 563 | 8.13 |
| Solid Waste | 48 | 0.69 |
| Liquid Waste | 259 | 3.74 |
| Gas Waste | 54 | 0.78 |
| Unknown Waste | 5 | 0.07 |
| Total Solid | 227 | 3.28 |
| Total Liquid | 5670 | 81.84 |
| Total Gas | 1075 | 15.52 |
| **PROPERTY DAMAGE** | | |
| Yes | 476 | 6.87 |
| No | 1891 | 27.30 |
| Unknown | 4561 | 65.83 |
| **ENVIRONMENTAL DAMAGE** | | |
| Yes | 181 | 2.61 |
| No | 669 | 9.66 |
| Unknown | 6078 | 87.73 |
| **AIR MEDIA AFFECTED** | | |
| Yes | 2052 | 29.62 |
| No | 363 | 5.24 |
| Unknown | 4513 | 65.14 |
| **WATER MEDIA AFFECTED** | | |
| Yes | 1042 | 15.04 |
| No | 2828 | 40.82 |
| Unknown | 3058 | 44.14 |
| **LAND MEDIA AFFECTED** | | |
| Yes | 3694 | 53.32 |
| No | 874 | 12.62 |
| Unknown | 2360 | 34.06 |
| **HIGH TEMPERATURE** | | |
| Yes | 114 | 2.20 |
| No | 835 | 16.12 |
| Unknown | 4230 | 81.68 |
| **HIGH PRESSURE** | | |
| Yes | 179 | 3.46 |
| No | 814 | 15.72 |
| Unknown | 4186 | 80.83 |

ENCYCLOPEDIA OF DATA
(All Records)

| | No. of Records | % of Total |
|---|---|---|
| EVACUATION? | | |
| Yes | 341 | 4.92 |
| No | 1173 | 16.93 |
| Unknown | 5414 | 78.15 |
| DEATHS? | | |
| Yes | 64 | 0.92 |
| No | 6297 | 90.89 |
| Unknown | 567 | 8.18 |
| INJURIES? | | |
| Yes | 459 | 6.63 |
| No | 5628 | 81.24 |
| Unknown | 841 | 12.14 |
| IN-PLANT | 5179 | 74.75 |
| IN-TRANSIT | 1749 | 25.25 |
| IN-PLANT LOCATION | | |
| Process Vessel | 732 | 14.13 |
| Storage Vessel | 1071 | 20.68 |
| Valves/Pipes | 1006 | 19.42 |
| Other | 1442 | 27.84 |
| Unknown | 928 | 17.92 |
| IN-PLANT CAUSE | | |
| Equipment Failure | 2244 | 43.33 |
| Operator Error | 592 | 11.43 |
| Upset Conditions | 159 | 3.07 |
| Fire | 164 | 3.17 |
| Other | 907 | 17.51 |
| Unknown | 1113 | 21.49 |
| OPERATIONAL CONFIGURATION | | |
| Loading/Unloading | 782 | 15.10 |
| Steady State | 1585 | 30.60 |
| Start-Up | 54 | 1.04 |
| Shut Down | 28 | 0.54 |
| Maintenance | 121 | 2.34 |
| Other | 124 | 2.39 |
| Unknown | 2485 | 47.98 |
| IN-TRANSIT MODE | | |
| Truck | 953 | 54.49 |
| Rail | 632 | 36.13 |
| Barge | 66 | 3.77 |
| Pipeline | 55 | 3.14 |
| Other | 43 | 2.46 |

ENCYCLOPEDIA OF DATA
(All Records)

| | No. of Records | % of Total |
|---|---|---|
| IN-TRANSIT CAUSE | | |
| Leak | 671 | 38.36 |
| Collision | 355 | 20.30 |
| Other | 581 | 33.22 |
| Unknown | 142 | 8.12 |
| END EFFECTS | | |
| Spill | 4965 | 71.67 |
| Vapor Release | 1784 | 25.75 |
| Fire | 347 | 5.01 |
| Explosion | 247 | 3.57 |
| Other | 42 | 0.61 |
| PROCESS VESSEL AND: | | |
| Equipment Failure | 285 | 38.93 |
| Operator Error | 78 | 10.66 |
| Upset Conditions | 97 | 13.25 |
| Fire | 16 | 2.19 |
| Other | 148 | 20.22 |
| Unknown | 108 | 14.75 |
| STORAGE VESSEL AND: | | |
| Equipment Failure | 336 | 31.37 |
| Operator Error | 247 | 23.06 |
| Upset Conditions | 19 | 1.77 |
| Fire | 20 | 1.87 |
| Other | 207 | 19.33 |
| Unknown | 242 | 22.60 |
| VALVES/PIPES AND: | | |
| Equipment Failure | 659 | 65.51 |
| Operator Error | 124 | 12.33 |
| Upset Conditions | 8 | 0.80 |
| Fire | 1 | 0.10 |
| Other | 154 | 15.31 |
| Unknown | 60 | 5.96 |
| OTHER LOCATION AND: | | |
| Equipment Failure | 620 | 43.00 |
| Operator Error | 91 | 6.31 |
| Upset Conditions | 23 | 1.60 |
| Fire | 55 | 3.81 |
| Other | 304 | 21.08 |
| Unknown | 349 | 24.20 |

ENCYCLOPEDIA OF DATA
(All Records)

| | No. of Records | % of Total |
|---|---|---|
| PROCESS VESSEL AND: | | |
| Loading/Unloading | 21 | 2.87 |
| Steady State | 292 | 39.89 |
| Start-Up | 27 | 3.69 |
| Shut Down | 10 | 1.37 |
| Maintenance | 12 | 1.64 |
| Other | 5 | 0.68 |
| Unknown | 365 | 49.86 |
| STORAGE VESSEL AND: | | |
| Loading/Unloading | 410 | 38.28 |
| Steady State | 241 | 22.50 |
| Start-Up | 1 | 0.09 |
| Shut Down | 3 | 0.28 |
| Maintenance | 9 | 0.84 |
| Other | 53 | 4.95 |
| Unknown | 354 | 33.05 |
| VALVES/PIPES AND: | | |
| Loading/Unloading | 203 | 20.18 |
| Steady State | 282 | 28.03 |
| Start-Up | 16 | 1.59 |
| Shut Down | 2 | 0.20 |
| Maintenance | 56 | 5.57 |
| Other | 12 | 1.19 |
| Unknown | 435 | 43.24 |
| OTHER LOCATIONS AND: | | |
| Loading/Unloading | 86 | 5.96 |
| Steady State | 734 | 50.90 |
| Start-Up | 7 | 0.49 |
| Shut Down | 7 | 0.49 |
| Maintenance | 39 | 2.70 |
| Other | 43 | 2.98 |
| Unknown | 526 | 36.48 |

ENCYCLOPEDIA OF DATA
(All Records)

| | No. of Records | % of Total |
|---|---|---|
| SOURCES | | |
| CAL | 141 | |
| NJE | 116 | |
| NRC | 5032 | |
| OHE | 263 | |
| RG7 | 513 | |
| TXA | 442 | |
| CHP | 67 | |
| MMA | 64 | |
| NTP | 65 | |
| UPI | 139 | |
| LAT | 28 | |
| CHT | 12 | |
| NYT | 46 | |
| TOTAL RECORDS | 6928 | |

TOP TWENTY SUBSTANCES BY NUMBER OF RECORDS

| SUBSTANCE | NUMBER OF RECORDS TOT | % OF TOT | QUANTITY IN POUNDS TOT | % OF TOT | AVG QUANT PER RECORD |
|---|---|---|---|---|---|
| PCBs | 1590 | 22.950 | 1,204.448 | 0.288 | 758 |
| SULFURIC ACID | 453 | 6.539 | 3,987,566 | 0.952 | 8,803 |
| ANHYDROUS AMMONIA | 258 | 3.724 | 2,756,031 | 0.658 | 10,682 |
| CHLORINE | 245 | 3.536 | 80,897 | 0.019 | 330 |
| HYDROCHLORIC ACID | 213 | 3.074 | 3,046,381 | 0.728 | 14,302 |
| SODIUM HYDROXIDE | 181 | 2.613 | 12,058,177 | 2.880 | 66,620 |
| METHYL ALCOHOL | 115 | 1.660 | 2,883,823 | 0.689 | 25,077 |
| METHYL CHLORIDE | 98 | 1.415 | 70,214 | 0.017 | 716 |
| TOLUENE | 95 | 1.371 | 4,820.857 | 1.152 | 50,746 |
| NITRIC ACID | 115 | 1.660 | 3,939,974 | 0.941 | 34,261 |
| VINYL CHLORIDE | 79 | 1.140 | 200,812 | 0.048 | 2,542 |
| PHOSPHORIC ACID | 72 | 1.039 | 530,680 | 0.127 | 7,371 |
| FERTILIZER | 75 | 1.083 | 959,284 | 0.229 | 12,790 |
| BENZENE | 65 | 0.938 | 677,450 | 0.162 | 10,422 |
| SOLVENT | 74 | 1.068 | 682,389 | 0.163 | 9,221 |
| STYRENE | 62 | 0.895 | 251,130 | 0.060 | 4,050 |
| HYDROGEN SULFIDE | 58 | 0.837 | 128,488 | 0.031 | 2,215 |
| ETHYLENE DICHLORIDE | 63 | 0.909 | 676,345 | 0.162 | 10,736 |
| TETRACHLOROETHYLENE | 50 | 0.722 | 770,858 | 0.184 | 15,417 |
| SULFUR DIOXIDE | 46 | 0.664 | 898,668 | 0.215 | 19,536 |
| ALL OTHERS | 2921 | 42.162 | 378,033,825 | 90.297 | 129,419 |
| TOTAL | 6928 | 100.000 | 418,658,297 | 100.000 | 60,430 |

QUANTITY RANGES

| RANGE NUMBER | RANGE (LBS) |
|---|---|
| 1 | 1 - 10 |
| 2 | 11 - 100 |
| 3 | 101 - 1,000 |
| 4 | 1K - 10K |
| 5 | 10K - 25K |
| 6 | 25K - 50K |
| 7 | 50K - 100K |
| 8 | 100K + |

NUMBER OF RECORDS - ALL RECORDS

| RANGE | TOTAL TOT | TOTAL % OF TOT | PROCESS VESSEL TOT | PROCESS VESSEL % OF TOT | STORAGE VESSEL TOT | STORAGE VESSEL % OF TOT | VALVES/PIPES TOT | VALVES/PIPES % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 653 | 12.541 | 52 | 9.830 | 20 | 2.519 | 56 | 6.335 | 286 | 23.139 |
| 2 | 1291 | 24.794 | 118 | 22.306 | 87 | 10.957 | 168 | 19.005 | 453 | 36.650 |
| 3 | 1278 | 24.544 | 152 | 28.733 | 201 | 25.315 | 199 | 22.511 | 287 | 23.220 |
| 4 | 1142 | 21.932 | 115 | 21.739 | 291 | 36.650 | 286 | 32.353 | 122 | 9.871 |
| 5 | 318 | 6.107 | 43 | 8.129 | 47 | 5.919 | 50 | 5.656 | 31 | 2.508 |
| 6 | 283 | 5.435 | 18 | 3.403 | 61 | 7.683 | 89 | 10.068 | 44 | 3.560 |
| 7 | 116 | 2.228 | 11 | 2.079 | 34 | 4.282 | 17 | 1.923 | 1 | 0.081 |
| 8 | 126 | 2.420 | 20 | 3.781 | 53 | 6.675 | 19 | 2.149 | 12 | 0.971 |
| TOT | 5207 | 100.000 | 529 | 100.000 | 794 | 100.000 | 884 | 100.000 | 1236 | 100.000 |

| RANGE | EQUIPMENT FAILURE TOT | EQUIPMENT FAILURE % OF TOT | OPERATOR ERROR TOT | OPERATOR ERROR % OF TOT | UPSET CONDITION TOT | UPSET CONDITION % OF TOT | FIRE TOT | FIRE % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 322 | 16.312 | 8 | 1.544 | 5 | 5.814 | 23 | 28.750 | 99 | 13.618 |
| 2 | 603 | 30.547 | 70 | 13.514 | 15 | 17.442 | 32 | 40.000 | 202 | 27.785 |
| 3 | 424 | 21.479 | 114 | 22.008 | 31 | 36.047 | 8 | 10.000 | 169 | 23.246 |
| 4 | 382 | 19.352 | 155 | 29.923 | 25 | 29.070 | 13 | 16.250 | 166 | 22.834 |
| 5 | 76 | 3.850 | 56 | 10.811 | 5 | 5.814 | 2 | 2.500 | 25 | 3.439 |
| 6 | 80 | 4.053 | 89 | 17.181 | 2 | 2.326 | 0 | 0.000 | 38 | 5.227 |
| 7 | 37 | 1.874 | 11 | 2.124 | 0 | 0.000 | 2 | 2.500 | 2 | 0.275 |
| 8 | 50 | 2.533 | 15 | 2.896 | 3 | 3.488 | 0 | 0.000 | 26 | 3.576 |
| TOT | 1974 | 100.000 | 518 | 100.000 | 86 | 100.000 | 80 | 100.000 | 727 | 100.000 |

| RANGE | TRUCK TOT | TRUCK % OF TOT | RAIL TOT | RAIL % OF TOT | PIPELINE TOT | PIPELINE % OF TOT | BARGE TOT | BARGE % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 69 | 9.225 | 48 | 18.605 | 0 | 0.000 | 0 | 0.000 | 2 | 7.692 |
| 2 | 91 | 12.166 | 40 | 15.504 | 2 | 6.250 | 10 | 34.483 | 11 | 42.308 |
| 3 | 251 | 33.556 | 67 | 25.969 | 4 | 12.500 | 12 | 41.379 | 6 | 23.077 |
| 4 | 190 | 25.401 | 31 | 12.016 | 12 | 37.500 | 1 | 3.448 | 7 | 26.923 |
| 5 | 85 | 11.364 | 24 | 9.302 | 11 | 34.375 | 2 | 6.897 | 0 | 0.000 |
| 6 | 44 | 5.882 | 5 | 1.938 | 0 | 0.000 | 1 | 3.448 | 0 | 0.000 |
| 7 | 11 | 1.471 | 34 | 13.178 | 0 | 0.000 | 1 | 3.448 | 0 | 0.000 |
| 8 | 7 | 0.936 | 9 | 3.488 | 3 | 9.375 | 2 | 6.897 | 0 | 0.000 |
| TOT | 748 | 100.000 | 258 | 100.000 | 32 | 100.000 | 29 | 100.000 | 26 | 100.000 |

QUANTITY IN POUNDS - ALL RECORDS

| RANGE | TOTAL TOTAL | TOTAL PERCENT | PROCESS VESSEL TOTAL | PROCESS VESSEL PERCENT | STORAGE VESSEL TOTAL | STORAGE VESSEL PERCENT | VALVES/PIPES TOTAL | VALVES/PIPES PERCENT | OTHER TOTAL | OTHER PERCENT | UNKNOWN TOTAL | UNKNOWN PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 3,823 | 0.001 | 430 | 0.004 | 164 | .000 | 247 | 0.003 | 1,744 | 0.006 | 757 | 0.036 |
| 2 | 50,145 | 0.012 | 5,376 | 0.046 | 5,053 | 0.002 | 10,442 | 0.115 | 12,226 | 0.044 | 9,614 | 0.451 |
| 3 | 534,411 | 0.128 | 53,718 | 0.458 | 84,953 | 0.026 | 104,330 | 1.154 | 113,867 | 0.414 | 39,223 | 1.839 |
| 4 | 4,138,908 | 0.989 | 477,087 | 4.063 | 1,100,154 | 0.339 | 985,494 | 10.897 | 385,053 | 1.401 | 279,519 | 13.109 |
| 5 | 5,306,984 | 1.268 | 662,480 | 5.642 | 899,254 | 0.277 | 850,721 | 9.407 | 462,025 | 1.681 | 449,578 | 21.084 |
| 6 | 10,315,186 | 2.464 | 798,980 | 6.805 | 2,220,100 | 0.684 | 3,048,810 | 33.712 | 1,585,030 | 5.765 | 761,540 | 35.715 |
| 7 | 8,294,668 | 1.981 | 652,500 | 5.557 | 2,337,250 | 0.720 | 1,159,730 | 12.824 | 74,888 | 0.272 | 472,550 | 22.162 |
| 8 | 390,014,172 | 93.158 | 9,090,500 | 77.425 | 317,916,250 | 97.952 | 2,884,000 | 31.889 | 24,858,420 | 90.416 | 119,502 | 5.604 |
| TOTAL | 418,658,297 | 100.000 | 11,741,071 | 100.000 | 324,563,178 | 100.000 | 9,043,774 | 100.000 | 27,493,253 | 100.000 | 2,132,283 | 100.000 |

| RANGE | EQUIPMENT FAILURE TOTAL | EQUIPMENT FAILURE PERCENT | OPERATOR ERROR TOTAL | OPERATOR ERROR PERCENT | UPSET CONDITION TOTAL | UPSET CONDITION PERCENT | FIRE TOTAL | FIRE PERCENT | OTHER TOTAL | OTHER PERCENT | UNKNOWN TOTAL | UNKNOWN PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2,135 | 0.007 | 41 | .000 | 34 | 0.003 | 183 | 0.064 | 523 | .000 | 426 | 0.001 |
| 2 | 19,762 | 0.062 | 4,106 | 0.040 | 746 | 0.075 | 865 | 0.301 | 7,623 | 0.003 | 9,609 | 0.033 |
| 3 | 199,157 | 0.624 | 46,680 | 0.450 | 15,471 | 1.560 | 4,051 | 1.409 | 59,813 | 0.020 | 70,919 | 0.247 |
| 4 | 1,387,629 | 4.348 | 537,261 | 5.183 | 64,138 | 6.468 | 80,896 | 28.147 | 588,140 | 0.194 | 569,243 | 1.979 |
| 5 | 1,372,138 | 4.299 | 957,000 | 9.232 | 70,658 | 7.126 | 31,913 | 11.104 | 379,125 | 0.125 | 513,224 | 1.784 |
| 6 | 2,853,780 | 8.941 | 3,306,810 | 31.899 | 65,000 | 6.555 | 0 | 0.000 | 1,383,850 | 0.457 | 805,020 | 2.798 |
| 7 | 2,585,980 | 8.102 | 678,750 | 6.548 | 0 | 0.000 | 169,500 | 58.975 | 144,750 | 0.048 | 1,117,938 | 3.886 |
| 8 | 23,496,000 | 73.617 | 4,835,750 | 46.648 | 775,500 | 78.211 | 0 | 0.000 | 300,078,500 | 99.153 | 25,682,922 | 89.272 |
| TOTAL | 31,916,581 | 100.000 | 10,366,398 | 100.000 | 991,547 | 100.000 | 287,408 | 100.000 | 302,642,324 | 100.000 | 28,769,301 | 100.000 |

| RANGE | TRUCK TOTAL | TRUCK PERCENT | RAIL TOTAL | RAIL PERCENT | PIPELINE TOTAL | PIPELINE PERCENT | BARGE TOTAL | BARGE PERCENT | OTHER TOTAL | OTHER PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 261 | 0.003 | 202 | 0.003 | 0 | 0.000 | 0 | 0.000 | 18 | 0.055 |
| 2 | 4,290 | 0.056 | 1,899 | 0.027 | 175 | 0.001 | 750 | 0.022 | 320 | 0.972 |
| 3 | 92,908 | 1.223 | 36,024 | 0.513 | 3,375 | 0.013 | 2,450 | 0.073 | 3,563 | 10.823 |
| 4 | 767,706 | 10.110 | 75,795 | 1.079 | 31,580 | 0.123 | 7,500 | 0.224 | 29,020 | 88.150 |
| 5 | 1,389,648 | 18.300 | 345,000 | 4.912 | 200,278 | 0.780 | 48,000 | 1.436 | 0 | 0.000 |
| 6 | 1,586,183 | 20.888 | 219,543 | 3.126 | 0 | 0.000 | 95,000 | 2.841 | 0 | 0.000 |
| 7 | 680,250 | 8.958 | 2,842,500 | 40.469 | 0 | 0.000 | 75,000 | 2.243 | 0 | 0.000 |
| 8 | 3,072,500 | 40.461 | 3,503,000 | 49.872 | 25,455,000 | 99.084 | 3,115,000 | 93.160 | 0 | 0.000 |
| TOTAL | 7,593,746 | 100.000 | 7,023,963 | 100.000 | 25,690,408 | 100.000 | 3,343,700 | 100.000 | 32,921 | 100.000 |

FREQUENCY OF ENDEFFECTS AS WORST ENDEFFECT OCCURING

| | ALL RECORDS | | DEATH/INJURY RECORDS | |
|---|---|---|---|---|
| | No. of Records | % of Total | No. of Records | % of Total |
| WORST END EFFECT | | | | |
| Explosion | 259 | 3.738 | 110 | 23.504 |
| Fire | 196 | 2.829 | 43 | 9.188 |
| Vapor Release | 1643 | 23.715 | 188 | 40.171 |
| Spill | 4281 | 61.793 | 116 | 24.786 |
| Other | 20 | 0.289 | 0 | 0.000 |
| Unknown | 529 | 7.636 | 11 | 2.350 |
| Total | 6928 | 100.000 | 468 | 100.000 |

COMPARISON TO BHOPAL
(All Records)

| | No. of Records | % of Total |
|---|---|---|
| Quantity released > 80,000 pounds | 157 | 2.266 |
| Storage Vessel and Operator Error | 280 | 4.042 |
| Storage Vessel and Vapor Release | 173 | 2.497 |
| Vapor Release and Operator Error | 106 | 1.530 |
| Storage Vessel, Operator Error, and Vapor Release | 44 | 0.635 |
| Total Records | 6928 | |

# APPENDIX E

# DATABASE SUMMARY FOR DEATH/INJURY EVENTS

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

-DEATH/INJURY RECORDS-

| | No. of Records | % of Total |
|---|---|---|
| **SUBSTANCE STATE** | | |
| Solid | 27 | 5.77 |
| Liquid | 324 | 69.23 |
| Gas | 109 | 23.29 |
| Unknown | 82 | 17.52 |
| Solid Waste | 2 | 0.43 |
| Liquid Waste | 13 | 2.78 |
| Gas Waste | 2 | 0.43 |
| Unknown Waste | 2 | 0.43 |
| Total Solid | 29 | 6.20 |
| Total Liquid | 337 | 72.01 |
| Total Gas | 111 | 23.72 |
| **PROPERTY DAMAGE** | | |
| Yes | 166 | 35.47 |
| No | 87 | 18.59 |
| Unknown | 215 | 45.94 |
| **ENVIRONMENTAL DAMAGE** | | |
| Yes | 45 | 9.62 |
| No | 52 | 11.11 |
| Unknown | 371 | 79.27 |
| **AIR MEDIA AFFECTED** | | |
| Yes | 312 | 66.67 |
| No | 17 | 3.63 |
| Unknown | 139 | 29.70 |
| **WATER MEDIA AFFECTED** | | |
| Yes | 51 | 10.90 |
| No | 155 | 33.12 |
| Unknown | 262 | 55.98 |
| **LAND MEDIA AFFECTED** | | |
| Yes | 156 | 33.33 |
| No | 75 | 16.03 |
| Unknown | 237 | 50.64 |
| **HIGH TEMPERATURE** | | |
| Yes | 22 | 7.24 |
| No | 37 | 12.17 |
| Unknown | 245 | 80.59 |
| **HIGH PRESSURE** | | |
| Yes | 26 | 8.55 |
| No | 34 | 11.18 |
| Unknown | 244 | 80.26 |

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH/INJURY RECORDS- | |
|---|---|---|
| | No. of Records | % of Total |
| EVACUATION? | | |
| Yes | 155 | 33.12 |
| No | 74 | 15.81 |
| Unknown | 239 | 51.07 |
| DEATHS? | | |
| Yes | 64 | 13.68 |
| No | 377 | 80.56 |
| Unknown | 27 | 5.77 |
| INJURIES? | | |
| Yes | 459 | 98.08 |
| No | 5 | 1.07 |
| Unknown | 4 | 0.85 |
| IN-PLANT | 304 | 64.96 |
| IN-TRANSIT | 164 | 35.04 |
| IN-PLANT LOCATION | | |
| Process Vessel | 39 | 12.83 |
| Storage Vessel | 110 | 36.18 |
| Valves/Pipes | 51 | 16.78 |
| Other | 46 | 15.13 |
| Unknown | 58 | 19.08 |
| IN-PLANT CAUSE | | |
| Equipment Failure | 83 | 27.30 |
| Operator Error | 39 | 12.83 |
| Upset Conditions | 14 | 4.61 |
| Fire | 24 | 7.89 |
| Other | 22 | 7.24 |
| Unknown | 122 | 40.13 |
| OPERATIONAL CONFIGURATION | | |
| Loading/Unloading | 55 | 18.09 |
| Steady State | 40 | 13.16 |
| Start-Up | 5 | 1.64 |
| Shut Down | 5 | 1.64 |
| Maintenance | 13 | 4.28 |
| Other | 21 | 6.91 |
| Unknown | 165 | 54.28 |
| IN-TRANSIT MODE | | |
| Truck | 113 | 68.90 |
| Rail | 32 | 19.51 |
| Barge | 8 | 4.88 |
| Pipeline | 3 | 1.83 |
| Other | 8 | 4.88 |

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH/INJURY RECORDS- | |
|---|---|---|
| | No. of Records | % of Total |
| IN-TRANSIT CAUSE | | |
| Leak | 55 | 33.54 |
| Collision | 71 | 43.29 |
| Other | 26 | 15.85 |
| Unknown | 12 | 7.32 |
| END EFFECTS | | |
| Spill | 254 | 54.27 |
| Vapor Release | 246 | 52.56 |
| Fire | 126 | 26.92 |
| Explosion | 109 | 23.29 |
| Other | 4 | 0.85 |
| PROCESS VESSEL AND: | | |
| Equipment Failure | 14 | 35.90 |
| Operator Error | 6 | 15.38 |
| Upset Conditions | 5 | 12.82 |
| Fire | 0 | 0.00 |
| Other | 2 | 5.13 |
| Unknown | 12 | 30.77 |
| STORAGE VESSEL AND: | | |
| Equipment Failure | 25 | 22.73 |
| Operator Error | 20 | 18.18 |
| Upset Conditions | 6 | 5.45 |
| Fire | 7 | 6.36 |
| Other | 8 | 7.27 |
| Unknown | 44 | 40.00 |
| VALVES/PIPES AND: | | |
| Equipment Failure | 35 | 68.63 |
| Operator Error | 6 | 11.76 |
| Upset Conditions | 1 | 1.96 |
| Fire | 1 | 1.96 |
| Other | 3 | 5.88 |
| Unknown | 5 | 9.80 |
| OTHER LOCATION AND: | | |
| Equipment Failure | 8 | 17.39 |
| Operator Error | 6 | 13.04 |
| Upset Conditions | 1 | 2.17 |
| Fire | 1 | 2.17 |
| Other | 7 | 15.22 |
| Unknown | 23 | 50.00 |

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH/INJURY RECORDS- | |
|---|---|---|
| | No. of Records | % of Total |
| PROCESS VESSEL AND: | | |
| Loading/Unloading | 1 | 2.56 |
| Steady State | 10 | 25.64 |
| Start-Up | 3 | 7.69 |
| Shut Down | 0 | 0.00 |
| Maintenance | 4 | 10.26 |
| Other | 3 | 7.69 |
| Unknown | 18 | 46.15 |
| STORAGE VESSEL AND: | | |
| Loading/Unloading | 37 | 33.64 |
| Steady State | 7 | 6.36 |
| Start-Up | 0 | 0.00 |
| Shut Down | 1 | 0.91 |
| Maintenance | 5 | 4.55 |
| Other | 8 | 7.27 |
| Unknown | 52 | 47.27 |
| VALVES/PIPES AND: | | |
| Loading/Unloading | 8 | 15.69 |
| Steady State | 12 | 23.53 |
| Start-Up | 1 | 1.96 |
| Shut Down | 1 | 1.96 |
| Maintenance | 1 | 1.96 |
| Other | 0 | 0.00 |
| Unknown | 28 | 54.90 |
| OTHER LOCATIONS AND: | | |
| Loading/Unloading | 5 | 10.87 |
| Steady State | 11 | 23.91 |
| Start-Up | 1 | 2.17 |
| Shut Down | 3 | 6.52 |
| Maintenance | 1 | 2.17 |
| Other | 10 | 21.74 |
| Unknown | 15 | 32.61 |

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH/INJURY RECORDS- | |
|---|---|---|
| | No. of Records | % of Total |
| SOURCES | | |
| CAL | 36 | |
| NJE | 32 | |
| NRC | 180 | |
| OHE | 32 | |
| RG7 | 13 | |
| TXA | 7 | |
| CHP | 5 | |
| MMA | 8 | |
| NTP | 25 | |
| UPI | 71 | |
| LAT | 17 | |
| CHT | 5 | |
| NYT | 37 | |
| TOTAL RECORDS | 468 | |

TOP TWENTY SUBSTANCES BY NUMBER OF RECORDS - DEATH/INJURY RECORDS

| SUBSTANCE | NUMBER OF RECORDS TOT | % OF TOT | QUANTITY IN POUNDS TOT | % OF TOT | AVG QUANT PER RECORD |
|---|---|---|---|---|---|
| PCBs | 13 | 2.778 | 16,879 | 0.058 | 1,298 |
| SULFURIC ACID | 22 | 4.701 | 56,527 | 0.195 | 2,569 |
| ANHYDROUS AMMONIA | 32 | 6.838 | 381,957 | 1.316 | 11,936 |
| CHLORINE | 45 | 9.615 | 15,635 | 0.054 | 347 |
| HYDROCHLORIC ACID | 26 | 5.556 | 166,649 | 0.574 | 6,410 |
| SODIUM HYDROXIDE | 9 | 1.923 | 716 | 0.002 | 80 |
| METHYL ALCOHOL | 2 | 0.427 | 55,500 | 0.191 | 27,750 |
| METHYL CHLORIDE | 0 | 0.000 | 0 | 0.000 | NA |
| TOLUENE | 11 | 2.350 | 976 | 0.003 | 89 |
| NITRIC ACID | 7 | 1.496 | 150,354 | 0.518 | 21,479 |
| VINYL CHLORIDE | 5 | 1.068 | 10 | .000 | 2 |
| PHOSPHORIC ACID | 4 | 0.855 | 1,925 | 0.007 | 481 |
| FERTILIZER | 4 | 0.855 | 150,750 | 0.519 | 37,688 |
| BENZENE | 5 | 1.068 | 300 | 0.001 | 60 |
| SOLVENT | 7 | 1.496 | 26,663 | 0.092 | 3,809 |
| STYRENE | 6 | 1.282 | 49,501 | 0.171 | 8,250 |
| HYDROGEN SULFIDE | 5 | 1.068 | 38 | .000 | 8 |
| ETHYLENE DICHLORIDE | 0 | 0.000 | 0 | 0.000 | NA |
| TETRACHLOROETHYLENE | 2 | 0.427 | 2,288 | 0.008 | 1,144 |
| SULFUR DIOXIDE | 1 | 0.214 | 150 | 0.001 | 150 |
| ALL OTHERS | 262 | 55.983 | 27,954,991 | 96.291 | 106,698 |
| TOTAL | 468 | 100.000 | 29,031,809 | 100.000 | 62,034 |

NUMBER OF RECORDS - DEATH/INJURY RECORDS

| RANGE | TOTAL TOT | TOTAL % OF TOT | PROCESS VESSEL TOT | PROCESS VESSEL % OF TOT | STORAGE VESSEL TOT | STORAGE VESSEL % OF TOT | PIPES/VALVES TOT | PIPES/VALVES % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 17 | 7.424 | 1 | 6.250 | 6 | 10.000 | 0 | 0.000 | 1 | 5.882 |
| 2 | 40 | 17.467 | 2 | 12.500 | 8 | 13.333 | 4 | 13.333 | 4 | 23.529 |
| 3 | 78 | 34.061 | 6 | 37.500 | 23 | 38.333 | 9 | 30.000 | 9 | 52.941 |
| 4 | 45 | 19.651 | 5 | 31.250 | 11 | 18.333 | 11 | 36.667 | 1 | 5.882 |
| 5 | 16 | 6.987 | 2 | 12.500 | 2 | 3.333 | 3 | 10.000 | 1 | 5.882 |
| 6 | 15 | 6.550 | 0 | 0.000 | 5 | 8.333 | 1 | 3.333 | 0 | 0.000 |
| 7 | 8 | 3.493 | 0 | 0.000 | 2 | 3.333 | 0 | 0.000 | 0 | 0.000 |
| 8 | 10 | 4.367 | 0 | 0.000 | 3 | 5.000 | 2 | 6.667 | 1 | 5.882 |
| TOT | 229 | 100.000 | 16 | 100.000 | 60 | 100.000 | 30 | 100.000 | 17 | 100.000 |

| RANGE | EQUIPMENT FAILURE TOT | EQUIPMENT FAILURE % OF TOT | OPERATOR ERROR TOT | OPERATOR ERROR % OF TOT | UPSET CONDITION TOT | UPSET CONDITION % OF TOT | FIRE TOT | FIRE % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3.922 | 4 | 15.385 | 1 | 11.111 | 0 | 0.000 | 1 | 7.692 |
| 2 | 9 | 17.647 | 3 | 11.538 | 1 | 11.111 | 0 | 0.000 | 3 | 23.077 |
| 3 | 17 | 33.333 | 8 | 30.769 | 4 | 44.444 | 2 | 100.000 | 5 | 38.462 |
| 4 | 14 | 27.451 | 6 | 23.077 | 1 | 11.111 | 0 | 0.000 | 1 | 7.692 |
| 5 | 2 | 3.922 | 4 | 15.385 | 1 | 11.111 | 0 | 0.000 | 0 | 0.000 |
| 6 | 2 | 3.922 | 0 | 0.000 | 1 | 11.111 | 0 | 0.000 | 2 | 15.385 |
| 7 | 2 | 3.922 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 8 | 3 | 5.882 | 1 | 3.846 | 0 | 0.000 | 0 | 0.000 | 1 | 7.692 |
| TOT | 51 | 100.000 | 26 | 100.000 | 9 | 100.000 | 2 | 100.000 | 13 | 100.000 |

| RANGE | TRUCK TOT | TRUCK % OF TOT | RAIL TOT | RAIL % OF TOT | PIPELINE TOT | PIPELINE % OF TOT | BARGE TOT | BARGE % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 7.246 | 2 | 14.286 | 0 | 0.000 | 0 | 0.000 | 2 | 40.000 |
| 2 | 13 | 18.841 | 3 | 21.429 | 1 | 50.000 | 0 | 0.000 | 1 | 20.000 |
| 3 | 21 | 30.435 | 3 | 21.429 | 1 | 50.000 | 0 | 0.000 | 2 | 40.000 |
| 4 | 12 | 17.391 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 5 | 6 | 8.696 | 0 | 0.000 | 0 | 0.000 | 2 | 66.667 | 0 | 0.000 |
| 6 | 7 | 10.145 | 2 | 14.286 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 7 | 3 | 4.348 | 2 | 14.286 | 0 | 0.000 | 1 | 33.333 | 0 | 0.000 |
| 8 | 2 | 2.899 | 2 | 14.286 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| TOT | 69 | 100.000 | 14 | 100.000 | 2 | 100.000 | 3 | 100.000 | 5 | 100.000 |

QUANTITY IN POUNDS - DEATH/INJURY RECORDS

| RANGE | TOTAL TOTAL | TOTAL PERCENT | PROCESS VESSEL TOTAL | PROCESS VESSEL PERCENT | STORAGE VESSEL TOTAL | STORAGE VESSEL PERCENT | PIPES/VALVES TOTAL | PIPES/VALVES PERCENT | OTHER TOTAL | OTHER PERCENT | UNKNOWN TOTAL | UNKNOWN PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 103 | .000 | 5 | 0.011 | 39 | 0.001 | 0 | 0.000 | 8 | .000 | 0 | 0.000 |
| 2 | 2,122 | 0.007 | 75 | 0.162 | 501 | 0.018 | 259 | 0.056 | 148 | 0.001 | 255 | 1.616 |
| 3 | 31,707 | 0.109 | 1,446 | 3.115 | 7,304 | 0.256 | 4,252 | 0.922 | 4,223 | 0.018 | 1,351 | 8.561 |
| 4 | 168,037 | 0.579 | 19,638 | 42.311 | 29,803 | 1.044 | 56,608 | 12.275 | 1,500 | 0.006 | 14,175 | 89.823 |
| 5 | 270,630 | 0.932 | 25,250 | 54.402 | 28,000 | 0.981 | 45,050 | 9.769 | 13,000 | 0.055 | 0 | 0.000 |
| 6 | 606,160 | 2.088 | 0 | 0.000 | 196,250 | 6.875 | 37,500 | 8.132 | 0 | 0.000 | 0 | 0.000 |
| 7 | 600,500 | 2.068 | 0 | 0.000 | 200,000 | 7.007 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 8 | 27,352,550 | 94.216 | 0 | 0.000 | 2,392,550 | 83.818 | 317,500 | 68.847 | 23,625,000 | 99.920 | 0 | 0.000 |
| TOTAL | 29,031,809 | 100.000 | 46,414 | 100.000 | 2,854,447 | 100.000 | 461,169 | 100.000 | 23,643,879 | 100.000 | 15,781 | 100.000 |

| RANGE | EQUIPMENT FAILURE TOTAL | EQUIPMENT FAILURE PERCENT | OPERATOR ERROR TOTAL | OPERATOR ERROR PERCENT | UPSET CONDITION TOTAL | UPSET CONDITION PERCENT | FIRE TOTAL | FIRE PERCENT | OTHER TOTAL | OTHER PERCENT | UNKNOWN TOTAL | UNKNOWN PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 18 | 0.001 | 21 | 0.009 | 5 | 0.011 | 0 | 0.000 | 8 | .000 | 0 | 0.000 |
| 2 | 646 | 0.032 | 163 | 0.071 | 25 | 0.053 | 0 | 0.000 | 75 | .000 | 329 | 0.034 |
| 3 | 3,900 | 0.191 | 2,872 | 1.257 | 1,486 | 3.161 | 1,300 | 100.000 | 3,014 | 0.013 | 6,004 | 0.613 |
| 4 | 63,346 | 3.103 | 22,803 | 9.983 | 5,000 | 10.635 | 0 | 0.000 | 2,250 | 0.009 | 28,325 | 2.891 |
| 5 | 23,300 | 1.141 | 60,000 | 26.269 | 13,000 | 27.650 | 0 | 0.000 | 0 | 0.000 | 15,000 | 1.531 |
| 6 | 82,500 | 4.042 | 0 | 0.000 | 27,500 | 58.491 | 0 | 0.000 | 93,750 | 0.395 | 30,000 | 3.062 |
| 7 | 200,000 | 9.798 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 8 | 1,667,500 | 81.692 | 142,550 | 62.410 | 0 | 0.000 | 0 | 0.000 | 23,625,000 | 99.582 | 900,000 | 91.869 |
| TOTAL | 2,041,210 | 100.000 | 228,409 | 100.000 | 47,016 | 100.000 | 1,300 | 100.000 | 23,724,097 | 100.000 | 979,658 | 100.000 |

| RANGE | TRUCK TOTAL | TRUCK PERCENT | RAIL TOTAL | RAIL PERCENT | PIPELINE TOTAL | PIPELINE PERCENT | BARGE TOTAL | BARGE PERCENT | OTHER TOTAL | OTHER PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 24 | 0.002 | 9 | 0.002 | 0 | 0.000 | 0 | 0.000 | 18 | 1.327 |
| 2 | 616 | 0.046 | 68 | 0.014 | 100 | 9.091 | 0 | 0.000 | 100 | 7.375 |
| 3 | 8,943 | 0.665 | 1,950 | 0.398 | 1,000 | 90.909 | 0 | 0.000 | 1,238 | 91.298 |
| 4 | 46,313 | 3.443 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 5 | 111,330 | 8.276 | 0 | 0.000 | 0 | 0.000 | 48,000 | 27.746 | 0 | 0.000 |
| 6 | 262,410 | 19.508 | 60,000 | 12.257 | 0 | 0.000 | 50,000 | 28.902 | 0 | 0.000 |
| 7 | 175,500 | 13.047 | 150,000 | 30.642 | 0 | 0.000 | 75,000 | 43.353 | 0 | 0.000 |
| 8 | 740,000 | 55.013 | 277,500 | 56.687 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| TOTAL | 1,345,136 | 100.000 | 489,527 | 100.000 | 1,100 | 100.000 | 173,000 | 100.000 | 1,356 | 100.000 |

REPORTABLE QUANTITIES - DEATH/INJURY RECORDS

| RQ | No. of Records | % of Total |
|---|---|---|
| 1 | 13 | 2.778 |
| 10 | 60 | 12.821 |
| 100 | 56 | 11.966 |
| 1000 | 63 | 13.462 |
| 5000 | 47 | 10.043 |
| N/A | 229 | 48.932 |
| Total | 468 | 100.000 |

Quantity Released/RQ for Death/Injury Records

| Range | No. of Records |
|---|---|
| 0.00 - 1.00 | 49 |
| 1.01 - 10.00 | 34 |
| 10.01 - 100.00 | 36 |
| 100.01 - 1000.00 | 16 |
| 1000.01 + | 4 |

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH RECORDS ONLY- | | -INJURY RECORDS ONLY- | |
|---|---|---|---|---|
| | No. of Records | % of Total | No. of Records | % of Total |
| SUBSTANCE STATE | | | | |
| Solid | 4 | 6.25 | 26 | 5.66 |
| Liquid | 45 | 70.31 | 316 | 68.85 |
| Gas | 16 | 25.00 | 109 | 23.75 |
| Unknown | 15 | 23.44 | 80 | 17.43 |
| Solid Waste | 0 | 0.00 | 2 | 0.44 |
| Liquid Waste | 1 | 1.56 | 13 | 2.83 |
| Gas Waste | 0 | 0.00 | 2 | 0.44 |
| Unknown Waste | 1 | 1.56 | 2 | 0.44 |
| Total Solid | 4 | 6.25 | 28 | 6.10 |
| Total Liquid | 46 | 71.88 | 329 | 71.68 |
| Total Gas | 16 | 25.00 | 111 | 24.18 |
| PROPERTY DAMAGE | | | | |
| Yes | 45 | 70.31 | 161 | 35.08 |
| No | 3 | 4.69 | 86 | 18.74 |
| Unknown | 16 | 25.00 | 212 | 46.19 |
| ENVIRONMENTAL DAMAGE | | | | |
| Yes | 3 | 4.69 | 45 | 9.80 |
| No | 2 | 3.13 | 51 | 11.11 |
| Unknown | 59 | 92.19 | 363 | 79.08 |
| AIR MEDIA AFFECTED | | | | |
| Yes | 56 | 87.50 | 304 | 66.23 |
| No | 1 | 1.56 | 17 | 3.70 |
| Unknown | 7 | 10.94 | 138 | 30.07 |
| WATER MEDIA AFFECTED | | | | |
| Yes | 7 | 10.94 | 50 | 10.89 |
| No | 8 | 12.50 | 153 | 33.33 |
| Unknown | 49 | 76.56 | 256 | 55.77 |
| LAND MEDIA AFFECTED | | | | |
| Yes | 9 | 14.06 | 154 | 33.55 |
| No | 5 | 7.81 | 74 | 16.12 |
| Unknown | 50 | 78.13 | 231 | 50.33 |
| HIGH TEMPERATURE | | | | |
| Yes | 6 | 11.76 | 21 | 7.05 |
| No | 5 | 9.80 | 37 | 12.42 |
| Unknown | 40 | 78.43 | 240 | 80.54 |
| HIGH PRESSURE | | | | |
| Yes | 5 | 9.80 | 26 | 8.72 |
| No | 4 | 7.84 | 34 | 11.41 |
| Unknown | 42 | 82.35 | 238 | 79.87 |

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH RECORDS ONLY- | | -INJURY RECORDS ONLY- | |
|---|---|---|---|---|
| | No. of Records | % of Total | No. of Records | % of Total |
| EVACUATION? | | | | |
| Yes | 25 | 39.06 | 153 | 33.33 |
| No | 5 | 7.81 | 71 | 15.47 |
| Unknown | 34 | 53.13 | 235 | 51.20 |
| DEATHS? | | | | |
| Yes | 64 | 100.00 | 55 | 11.98 |
| No | 0 | 0.00 | 377 | 82.14 |
| Unknown | 0 | 0.00 | 27 | 5.88 |
| INJURIES? | | | | |
| Yes | 55 | 85.94 | 459 | 100.00 |
| No | 5 | 7.81 | 0 | 0.00 |
| Unknown | 4 | 6.25 | 0 | 0.00 |
| IN-PLANT | 51 | 79.69 | 298 | 64.92 |
| IN-TRANSIT | 13 | 20.31 | 161 | 35.08 |
| IN-PLANT LOCATION | | | | |
| Process Vessel | 5 | 9.80 | 39 | 13.09 |
| Storage Vessel | 16 | 31.37 | 108 | 36.24 |
| Valves/Pipes | 4 | 7.84 | 51 | 17.11 |
| Other | 9 | 17.65 | 44 | 14.77 |
| Unknown | 17 | 33.33 | 56 | 18.79 |
| IN-PLANT CAUSE | | | | |
| Equipment Failure | 4 | 7.84 | 83 | 27.85 |
| Operator Error | 7 | 13.73 | 38 | 12.75 |
| Upset Conditions | 0 | 0.00 | 14 | 4.70 |
| Fire | 2 | 3.92 | 24 | 8.05 |
| Other | 3 | 5.88 | 21 | 7.05 |
| Unknown | 35 | 68.63 | 118 | 39.60 |
| OPERATIONAL CONFIGURATION | | | | |
| Loading/Unloading | 7 | 13.73 | 55 | 18.46 |
| Steady State | 4 | 7.84 | 39 | 13.09 |
| Start-Up | 1 | 1.96 | 5 | 1.68 |
| Shut Down | 0 | 0.00 | 5 | 1.68 |
| Maintenance | 4 | 7.84 | 13 | 4.36 |
| Other | 7 | 13.73 | 21 | 7.05 |
| Unknown | 28 | 54.90 | 162 | 54.36 |
| IN-TRANSIT MODE | | | | |
| Truck | 9 | 69.23 | 110 | 68.32 |
| Rail | 2 | 15.38 | 32 | 19.88 |
| Barge | 1 | 7.69 | 8 | 4.97 |
| Pipeline | 1 | 7.69 | 3 | 1.86 |
| Other | 0 | 0.00 | 8 | 4.97 |

- ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH RECORDS ONLY- | | -INJURY RECORDS ONLY- | |
|---|---|---|---|---|
| | No. of Records | % of Total | No. of Records | % of Total |
| IN-TRANSIT CAUSE | | | | |
| Leak | 0 | 0.00 | 55 | 34.16 |
| Collision | 6 | 46.15 | 69 | 42.86 |
| Other | 6 | 46.15 | 25 | 15.53 |
| Unknown | 1 | 7.69 | 12 | 7.45 |
| END EFFECTS | | | | |
| Spill | 18 | 28.13 | 251 | 54.68 |
| Vapor Release | 26 | 40.63 | 241 | 52.51 |
| Fire | 42 | 65.63 | 123 | 26.80 |
| Explosion | 45 | 70.31 | 104 | 22.66 |
| Other | 0 | 0.00 | 4 | 0.87 |
| PROCESS VESSEL AND: | | | | |
| Equipment Failure | 0 | 0.00 | 14 | 35.90 |
| Operator Error | 2 | 40.00 | 6 | 15.38 |
| Upset Conditions | 0 | 0.00 | 5 | 12.82 |
| Fire | 0 | 0.00 | 0 | 0.00 |
| Other | 0 | 0.00 | 2 | 5.13 |
| Unknown | 3 | 60.00 | 12 | 30.77 |
| STORAGE VESSEL AND: | | | | |
| Equipment Failure | 0 | 0.00 | 25 | 23.15 |
| Operator Error | 4 | 25.00 | 20 | 18.52 |
| Upset Conditions | 0 | 0.00 | 6 | 5.56 |
| Fire | 1 | 6.25 | 7 | 6.48 |
| Other | 0 | 0.00 | 8 | 7.41 |
| Unknown | 11 | 68.75 | 42 | 38.89 |
| VALVES/PIPES AND: | | | | |
| Equipment Failure | 3 | 75.00 | 35 | 68.63 |
| Operator Error | 0 | 0.00 | 6 | 11.76 |
| Upset Conditions | 0 | 0.00 | 1 | 1.96 |
| Fire | 0 | 0.00 | 1 | 1.96 |
| Other | 0 | 0.00 | 3 | 5.88 |
| Unknown | 1 | 25.00 | 5 | 9.80 |
| OTHER LOCATION AND: | | | | |
| Equipment Failure | 0 | 0.00 | 8 | 18.18 |
| Operator Error | 1 | 11.11 | 5 | 11.36 |
| Upset Conditions | 0 | 0.00 | 1 | 2.27 |
| Fire | 0 | 0.00 | 1 | 2.27 |
| Other | 2 | 22.22 | 7 | 15.91 |
| Unknown | 6 | 66.67 | 22 | 50.00 |

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH RECORDS ONLY- | | -INJURY RECORDS ONLY- | |
|---|---|---|---|---|
| | No. of Records | % of Total | No. of Records | % of Total |
| PROCESS VESSEL AND: | | | | |
| Loading/Unloading | 0 | 0.00 | 1 | 2.56 |
| Steady State | 0 | 0.00 | 10 | 25.64 |
| Start-Up | 1 | 20.00 | 3 | 7.69 |
| Shut Down | 0 | 0.00 | 0 | 0.00 |
| Maintenance | 1 | 20.00 | 4 | 10.26 |
| Other | 1 | 20.00 | 3 | 7.69 |
| Unknown | 2 | 40.00 | 18 | 46.15 |
| STORAGE VESSEL AND: | | | | |
| Loading/Unloading | 3 | 18.75 | 37 | 34.26 |
| Steady State | 0 | 0.00 | 7 | 6.48 |
| Start-Up | 0 | 0.00 | 0 | 0.00 |
| Shut Down | 0 | 0.00 | 1 | 0.93 |
| Maintenance | 2 | 12.50 | 5 | 4.63 |
| Other | 3 | 18.75 | 8 | 7.41 |
| Unknown | 8 | 50.00 | 50 | 46.30 |
| VALVES/PIPES AND: | | | | |
| Loading/Unloading | 1 | 25.00 | 8 | 15.69 |
| Steady State | 1 | 25.00 | 12 | 23.53 |
| Start-Up | 0 | 0.00 | 1 | 1.96 |
| Shut Down | 0 | 0.00 | 1 | 1.96 |
| Maintenance | 0 | 0.00 | 1 | 1.96 |
| Other | 0 | 0.00 | 0 | 0.00 |
| Unknown | 2 | 50.00 | 28 | 54.90 |
| OTHER LOCATIONS AND: | | | | |
| Loading/Unloading | 1 | 11.11 | 5 | 11.36 |
| Steady State | 3 | 33.33 | 10 | 22.73 |
| Start-Up | 0 | 0.00 | 1 | 2.27 |
| Shut Down | 0 | 0.00 | 3 | 6.82 |
| Maintenance | 0 | 0.00 | 1 | 2.27 |
| Other | 3 | 33.33 | 10 | 22.73 |
| Unknown | 2 | 22.22 | 14 | 31.82 |

ENCYCLOPEDIA OF DATA
(Death and Injury Records)

| | -DEATH RECORDS ONLY- | | -INJURY RECORDS ONLY- | |
|---|---|---|---|---|
| | No. of Records | % of Total | No. of Records | % of Total |
| SOURCES | | | | |
| CAL | 1 | | 36 | |
| NJE | 3 | | 31 | |
| NRC | 4 | | 179 | |
| OHE | 4 | | 30 | |
| RG7 | 3 | | 13 | |
| TXA | 0 | | 7 | |
| CHP | 0 | | 5 | |
| MMA | 5 | | 8 | |
| NTP | 7 | | 24 | |
| UPI | 22 | | 68 | |
| LAT | 4 | | 17 | |
| CHT | 0 | | 5 | |
| NYT | 11 | | 36 | |
| TOTAL RECORDS | 64 | | 459 | |

TOP TWENTY SUBSTANCES BY NUMBER OF RECORDS - DEATH RECORDS

| SUBSTANCE | NUMBER OF RECORDS TOT | % OF TOT | QUANTITY IN POUNDS TOT | % OF TOT | AVG QUANT PER RECORD |
|---|---|---|---|---|---|
| PCBs | 0 | 0.000 | 0 | 0.000 | NA |
| SULFURIC ACID | 2 | 11.765 | 7,500 | 0.030 | 3,750 |
| ANHYDROUS AMMONIA | 1 | 5.882 | 3,750 | 0.015 | 3,750 |
| CHLORINE | 3 | 17.647 | 2,225 | 0.009 | 742 |
| HYDROCHLORIC ACID | 0 | 0.000 | 0 | 0.000 | NA |
| SODIUM HYDROXIDE | 1 | 5.882 | 100 | .000 | 100 |
| METHYL ALCOHOL | 0 | 0.000 | 0 | 0.000 | NA |
| METHYL CHLORIDE | 0 | 0.000 | 0 | 0.000 | NA |
| TOLUENE | 3 | 17.647 | 0 | 0.000 | 0 |
| NITRIC ACID | 1 | 5.882 | 0 | 0.000 | 0 |
| VINYL CHLORIDE | 0 | 0.000 | 0 | 0.000 | NA |
| PHOSPHORIC ACID | 0 | 0.000 | 0 | 0.000 | NA |
| FERTILIZER | 0 | 0.000 | 0 | 0.000 | NA |
| BENZENE | 1 | 0.214 | 0 | 0.000 | 0 |
| SOLVENT | 1 | 0.214 | 0 | 0.000 | 0 |
| STYRENE | 0 | 0.000 | 0 | 0.000 | NA |
| HYDROGEN SULFIDE | 2 | 0.427 | 0 | 0.000 | 0 |
| ETHYLENE DICHLORIDE | 0 | 0.000 | 0 | 0.000 | NA |
| TETRACHLOROETHYLENE | 0 | 0.000 | 0 | 0.000 | NA |
| SULFUR DIOXIDE | 0 | 0.000 | 0 | 0.000 | NA |
| ALL OTHERS | 2 | 0.427 | 24,780,338 | 85.356 | 12,390,169 |
| TOTAL | 17 | 100.000 | 24,793,913 | 100.000 | 1,458,465 |

NUMBER OF RECORDS - DEATH RECORDS ONLY

| RANGE | TOTAL TOT | TOTAL % OF TOT | PROCESS VESSEL TOT | PROCESS VESSEL % OF TOT | STORAGE VESSEL TOT | STORAGE VESSEL % OF TOT | PIPES/VALVES TOT | PIPES/VALVES % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 2 | 2 | 11.765 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 3 | 1 | 5.882 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 4 | 5 | 29.412 | 1 | 50.000 | 0 | 0.000 | 2 | 100.000 | 0 | 0.000 |
| 5 | 3 | 17.647 | 1 | 50.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 6 | 2 | 11.765 | 0 | 0.000 | 1 | 50.000 | 0 | 0.000 | 0 | 0.000 |
| 7 | 2 | 11.765 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 8 | 2 | 11.765 | 0 | 0.000 | 1 | 50.000 | 0 | 0.000 | 1 | 100.000 |
| TOT | 17 | 100.000 | 2 | 100.000 | 2 | 100.000 | 2 | 100.000 | 1 | 100.000 |

| RANGE | EQUIPMENT FAILURE TOT | EQUIPMENT FAILURE % OF TOT | OPERATOR ERROR TOT | OPERATOR ERROR % OF TOT | UPSET CONDITION TOT | UPSET CONDITION % OF TOT | FIRE TOT | FIRE % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 |
| 2 | 1 | 33.333 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 |
| 3 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 |
| 4 | 2 | 66.667 | 1 | 50.000 | 0 | NA | 0 | NA | 0 | 0.000 |
| 5 | 0 | 0.000 | 1 | 50.000 | 0 | NA | 0 | NA | 0 | 0.000 |
| 6 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 |
| 7 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 |
| 8 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 1 | 100.000 |
| TOT | 3 | 100.000 | 2 | 100.000 | 0 | NA | 0 | NA | 1 | 100.000 |

| RANGE | TRUCK TOT | TRUCK % OF TOT | RAIL TOT | RAIL % OF TOT | PIPELINE TOT | PIPELINE % OF TOT | BARGE TOT | BARGE % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 2 | 1 | 16.667 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 3 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 4 | 1 | 16.667 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 5 | 1 | 16.667 | 0 | NA | 0 | NA | 1 | 100.000 | 0 | NA |
| 6 | 1 | 16.667 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 7 | 2 | 33.333 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 8 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| TOT | 6 | 100.000 | 0 | NA | 0 | NA | 1 | 100.000 | 0 | NA |

[redacted]ANTI[redacted] POU[redacted]DEAT[redacted]RDS [redacted]

| RANGE | TOTAL TOTAL | TOTAL PERCENT | PROCESS VESSEL TOTAL | PROCESS VESSEL PERCENT | STORAGE VESSEL TOTAL | STORAGE VESSEL PERCENT | PIPES/VALVES TOTAL | PIPES/VALVES PERCENT | OTHER TOTAL | OTHER PERCENT | UNKNOWN TOTAL | UNKNOWN PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 2 | 138 | 0.001 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 100 | 4.706 |
| 3 | 225 | 0.001 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 225 | 10.588 |
| 4 | 22,550 | 0.091 | 2,000 | 12.500 | 0 | 0.000 | 15,000 | 100.000 | 0 | 0.000 | 1,800 | 84.706 |
| 5 | 55,000 | 0.222 | 14,000 | 87.500 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 6 | 71,000 | 0.286 | 0 | 0.000 | 30,000 | 3.226 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 7 | 120,000 | 0.484 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 8 | 24,525,000 | 98.915 | 0 | 0.000 | 900,000 | 96.774 | 0 | 0.000 | 23,625,000 | 100.000 | 0 | 0.000 |
| TOTAL | 24,793,913 | 100.000 | 16,000 | 100.000 | 930,000 | 100.000 | 15,000 | 100.000 | 23,625,000 | 100.000 | 2,125 | 100.000 |

| RANGE | EQUIPMENT FAILURE TOTAL | EQUIPMENT FAILURE PERCENT | OPERATOR ERROR TOTAL | OPERATOR ERROR PERCENT | UPSET CONDITION TOTAL | UPSET CONDITION PERCENT | FIRE TOTAL | FIRE PERCENT | OTHER TOTAL | OTHER PERCENT | UNKNOWN TOTAL | UNKNOWN PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | 0.000 |
| 2 | 100 | 0.662 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | 0.000 |
| 3 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 225 | 0.024 |
| 4 | 15,000 | 99.338 | 2,000 | 12.500 | 0 | NA | 0 | NA | 0 | 0.000 | 1,800 | 0.193 |
| 5 | 0 | 0.000 | 14,000 | 87.500 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | 0.000 |
| 6 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 30,000 | 3.219 |
| 7 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | 0.000 |
| 8 | 0 | 0.000 | 0 | 0.000 | 0 | NA | 0 | NA | 23,625,000 | 100.000 | 900,000 | 96.564 |
| TOTAL | 15,100 | 100.000 | 16,000 | 100.000 | 0 | NA | 0 | NA | 23,625,000 | 100.000 | 932,025 | 100.000 |

| RANGE | TRUCK TOTAL | TRUCK PERCENT | RAIL TOTAL | RAIL PERCENT | PIPELINE TOTAL | PIPELINE PERCENT | BARGE TOTAL | BARGE PERCENT | OTHER TOTAL | OTHER PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 2 | 38 | 0.021 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 3 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 4 | 3,750 | 2.052 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 5 | 18,000 | 9.847 | 0 | NA | 0 | NA | 23,000 | 100.000 | 0 | NA |
| 6 | 41,000 | 22.430 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 7 | 120,000 | 65.650 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| 8 | 0 | 0.000 | 0 | NA | 0 | NA | 0 | 0.000 | 0 | NA |
| TOTAL | 182,788 | 100.000 | 0 | NA | 0 | NA | 23,000 | 100.000 | 0 | NA |

TOP TWENTY SUBSTANCES BY NUMBER OF RECORDS - INJURY RECORDS

| SUBSTANCE | NUMBER OF RECORDS TOT | % OF TOT | QUANTITY IN POUNDS TOT | % OF TOT | AVG QUANT PER RECORD |
|---|---|---|---|---|---|
| PCBs | 13 | 5.752 | 16,879 | 0.058 | 1,298 |
| SULFURIC ACID | 21 | 9.292 | 56.527 | 0.195 | 2.692 |
| ANHYDROUS AMMONIA | 31 | 13.717 | 378,207 | 1.306 | 12,200 |
| CHLORINE | 45 | 19.912 | 15,635 | 0.054 | 347 |
| HYDROCHLORIC ACID | 26 | 11.504 | 166.649 | 0.576 | 6,410 |
| SODIUM HYDROXIDE | 9 | 3.982 | 716 | 0.002 | 80 |
| METHYL ALCOHOL | 2 | 0.885 | 55,500 | 0.192 | 27,750 |
| METHYL CHLORIDE | 0 | 0.000 | 0 | 0.000 | NA |
| TOLUENE | 11 | 4.867 | 976 | 0.003 | 89 |
| NITRIC ACID | 7 | 3.097 | 150.354 | 0.519 | 21,479 |
| VINYL CHLORIDE | 5 | 1.068 | 10 | .000 | 2 |
| PHOSPHORIC ACID | 4 | 0.855 | 1.925 | 0.007 | 481 |
| FERTILIZER | 4 | 0.855 | 150,750 | 0.519 | 37,688 |
| BENZENE | 5 | 1.068 | 300 | 0.001 | 60 |
| SOLVENT | 7 | 1.496 | 26,663 | 0.092 | 3,809 |
| STYRENE | 6 | 1.282 | 49,501 | 0.171 | 8.250 |
| HYDROGEN SULFIDE | 5 | 1.068 | 38 | .000 | 8 |
| ETHYLENE DICHLORIDE | 0 | 0.000 | 0 | 0.000 | NA |
| TETRACHLOROETHYLENE | 2 | 0.427 | 2,288 | 0.008 | 1,144 |
| SULFUR DIOXIDE | 1 | 0.214 | 150 | 0.001 | 150 |
| ALL OTHERS | 22 | 4.701 | 27,876,991 | 96.022 | 1,267,136 |
| TOTAL | 226 | 100.000 | 28,950,059 | 100.000 | 128,098 |

NUMBER OF RECORDS - INJURY RECORDS ONLY

| RANGE | TOTAL TOT | TOTAL % OF TOT | PROCESS VESSEL TOT | PROCESS VESSEL % OF TOT | STORAGE VESSEL TOT | STORAGE VESSEL % OF TOT | PIPES/VALVES TOT | PIPES/VALVES % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 17 | 7.522 | 1 | 6.250 | 6 | 10.000 | 0 | 0.000 | 1 | 5.882 |
| 2 | 40 | 17.699 | 2 | 12.500 | 8 | 13.333 | 4 | 13.333 | 4 | 23.529 |
| 3 | 78 | 34.513 | 6 | 37.500 | 23 | 38.333 | 9 | 30.000 | 9 | 52.941 |
| 4 | 44 | 19.469 | 5 | 31.250 | 11 | 18.333 | 11 | 36.667 | 1 | 5.882 |
| 5 | 15 | 6.637 | 2 | 12.500 | 2 | 3.333 | 3 | 10.000 | 1 | 5.882 |
| 6 | 15 | 6.637 | 0 | 0.000 | 5 | 8.333 | 1 | 3.333 | 0 | 0.000 |
| 7 | 7 | 3.097 | 0 | 0.000 | 2 | 3.333 | 0 | 0.000 | 0 | 0.000 |
| 8 | 10 | 4.425 | 0 | 0.000 | 3 | 5.000 | 2 | 6.667 | 1 | 5.882 |
| TOT | 226 | 100.000 | 16 | 100.000 | 60 | 100.000 | 30 | 100.000 | 17 | 100.000 |

| RANGE | EQUIPMENT FAILURE TOT | EQUIPMENT FAILURE % OF TOT | OPERATOR ERROR TOT | OPERATOR ERROR % OF TOT | UPSET CONDITION TOT | UPSET CONDITION % OF TOT | FIRE TOT | FIRE % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3.922 | 4 | 15.385 | 1 | 11.111 | 0 | 0.000 | 1 | 7.692 |
| 2 | 9 | 17.647 | 3 | 11.538 | 1 | 11.111 | 0 | 0.000 | 3 | 23.077 |
| 3 | 17 | 33.333 | 8 | 30.769 | 4 | 44.444 | 2 | 100.000 | 5 | 38.462 |
| 4 | 14 | 27.451 | 6 | 23.077 | 1 | 11.111 | 0 | 0.000 | 1 | 7.692 |
| 5 | 2 | 3.922 | 4 | 15.385 | 1 | 11.111 | 0 | 0.000 | 0 | 0.000 |
| 6 | 2 | 3.922 | 0 | 0.000 | 1 | 11.111 | 0 | 0.000 | 2 | 15.385 |
| 7 | 2 | 3.922 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 8 | 3 | 5.882 | 1 | 3.846 | 0 | 0.000 | 0 | 0.000 | 1 | 7.692 |
| TOT | 51 | 100.000 | 26 | 100.000 | 9 | 100.000 | 2 | 100.000 | 13 | 100.000 |

| RANGE | TRUCK TOT | TRUCK % OF TOT | RAIL TOT | RAIL % OF TOT | PIPELINE TOT | PIPELINE % OF TOT | BARGE TOT | BARGE % OF TOT | OTHER TOT | OTHER % OF TOT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 7.576 | 2 | 14.286 | 0 | 0.000 | 0 | 0.000 | 2 | 40.000 |
| 2 | 13 | 19.697 | 3 | 21.429 | 1 | 50.000 | 0 | 0.000 | 1 | 20.000 |
| 3 | 21 | 31.818 | 3 | 21.429 | 1 | 50.000 | 0 | 0.000 | 2 | 40.000 |
| 4 | 11 | 16.667 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 5 | 5 | 7.576 | 0 | 0.000 | 0 | 0.000 | 2 | 66.667 | 0 | 0.000 |
| 6 | 7 | 10.606 | 2 | 14.286 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 7 | 2 | 3.030 | 2 | 14.286 | 0 | 0.000 | 1 | 33.333 | 0 | 0.000 |
| 8 | 2 | 3.030 | 2 | 14.286 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| TOT | 66 | 100.000 | 14 | 100.000 | 2 | 100.000 | 3 | 100.000 | 5 | 100.000 |

QUANTITY IN POUNDS - INJURY RECORDS ONLY

| RANGE | TOTAL TOTAL | TOTAL PERCENT | PROCESS VESSEL TOTAL | PROCESS VESSEL PERCENT | STORAGE VESSEL TOTAL | STORAGE VESSEL PERCENT | PIPES/VALVES TOTAL | PIPES/VALVES PERCENT | OTHER TOTAL | OTHER PERCENT | UNKNOWN TOTAL | UNKNOWN PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 103 | .000 | 5 | 0.011 | 39 | 0.001 | 0 | 0.000 | 8 | .000 | 0 | 0.000 |
| 2 | 2,122 | 0.007 | 75 | 0.162 | 501 | 0.018 | 259 | 0.056 | 148 | 0.001 | 255 | 1.616 |
| 3 | 31,707 | 0.110 | 1,446 | 3.115 | 7,304 | 0.256 | 4,252 | 0.922 | 4,223 | 0.018 | 1,351 | 8.561 |
| 4 | 164,287 | 0.567 | 19,638 | 42.311 | 29,803 | 1.044 | 56,608 | 12.275 | 1,500 | 0.006 | 14,175 | 89.823 |
| 5 | 252,630 | 0.873 | 25,250 | 54.402 | 28,000 | 0.981 | 45,050 | 9.769 | 13,000 | 0.055 | 0 | 0.000 |
| 6 | 606,160 | 2.094 | 0 | 0.000 | 196,250 | 6.875 | 37,500 | 8.132 | 0 | 0.000 | 0 | 0.000 |
| 7 | 540,500 | 1.867 | 0 | 0.000 | 200,000 | 7.007 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 8 | 27,352,550 | 94.482 | 0 | 0.000 | 2,392,550 | 83.818 | 317,500 | 68.847 | 23,625,000 | 99.920 | 0 | 0.000 |
| TOTAL | 28,950,059 | 100.000 | 46,414 | 100.000 | 2,854,447 | 100.000 | 461,169 | 100.000 | 23,643,879 | 100.000 | 15,781 | 100.000 |

| RANGE | EQUIPMENT FAILURE TOTAL | EQUIPMENT FAILURE PERCENT | OPERATOR ERROR TOTAL | OPERATOR ERROR PERCENT | UPSET CONDITION TOTAL | UPSET CONDITION PERCENT | FIRE TOTAL | FIRE PERCENT | OTHER TOTAL | OTHER PERCENT | UNKNOWN TOTAL | UNKNOWN PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 18 | 0.001 | 21 | 0.009 | 5 | 0.011 | 0 | 0.000 | 8 | .000 | 0 | 0.000 |
| 2 | 646 | 0.032 | 163 | 0.071 | 25 | 0.053 | 0 | 0.000 | 75 | .000 | 329 | 0.034 |
| 3 | 3,900 | 0.191 | 2,872 | 1.257 | 1,486 | 3.161 | 1,300 | 100.000 | 3,014 | 0.013 | 6,004 | 0.613 |
| 4 | 63,346 | 3.103 | 22,803 | 9.983 | 5,000 | 10.635 | 0 | 0.000 | 2,250 | 0.009 | 28,325 | 2.891 |
| 5 | 23,300 | 1.141 | 60,000 | 26.269 | 13,000 | 27.650 | 0 | 0.000 | 0 | 0.000 | 15,000 | 1.531 |
| 6 | 82,500 | 4.042 | 0 | 0.000 | 27,500 | 58.491 | 0 | 0.000 | 93,750 | 0.395 | 30,000 | 3.062 |
| 7 | 200,000 | 9.798 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 8 | 1,667,500 | 81.692 | 142,550 | 62.410 | 0 | 0.000 | 0 | 0.000 | 23,625,000 | 99.582 | 900,000 | 91.869 |
| TOTAL | 2,041,210 | 100.000 | 228,409 | 100.000 | 47,016 | 100.000 | 1,300 | 100.000 | 23,724,097 | 100.000 | 979,658 | 100.000 |

| RANGE | TRUCK TOTAL | TRUCK PERCENT | RAIL TOTAL | RAIL PERCENT | PIPELINE TOTAL | PIPELINE PERCENT | BARGE TOTAL | BARGE PERCENT | OTHER TOTAL | OTHER PERCENT |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 24 | 0.002 | 9 | 0.002 | 0 | 0.000 | 0 | 0.000 | 18 | 1.327 |
| 2 | 616 | 0.049 | 68 | 0.014 | 100 | 9.091 | 0 | 0.000 | 100 | 7.375 |
| 3 | 8,943 | 0.708 | 1,950 | 0.398 | 1,000 | 90.909 | 0 | 0.000 | 1,238 | 91.298 |
| 4 | 42,563 | 3.369 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| 5 | 93,330 | 7.387 | 0 | 0.000 | 0 | 0.000 | 48,000 | 27.746 | 0 | 0.000 |
| 6 | 262,410 | 20.770 | 60,000 | 12.257 | 0 | 0.000 | 50,000 | 28.902 | 0 | 0.000 |
| 7 | 115,500 | 9.142 | 150,000 | 30.642 | 0 | 0.000 | 75,000 | 43.353 | 0 | 0.000 |
| 8 | 740,000 | 58.573 | 277,500 | 56.687 | 0 | 0.000 | 0 | 0.000 | 0 | 0.000 |
| TOTAL | 1,263,386 | 100.000 | 489,527 | 100.000 | 1,100 | 100.000 | 173,000 | 100.000 | 1,356 | 100.000 |

# APPENDIX F

## DATABASE SUMMARY FOR RECORDS REPORTING SPILL OR VAPOR RELEASE AS WORST END EFFECT

ENCYCLOPEDIA OF DATA
(Records with Spill or Vapor Release as Worst End Effect)

| | No. of Records | % of Total |
|---|---|---|
| SUBSTANCE STATE | | |
| Solid | 137 | 2.31 |
| Liquid | 4732 | 79.88 |
| Gas | 916 | 15.46 |
| Unknown | 270 | 4.56 |
| Solid Waste | 34 | 0.57 |
| Liquid Waste | 222 | 3.75 |
| Gas Waste | 54 | 0.91 |
| Unknown Waste | 2 | 0.03 |
| Total Solid | 171 | 2.89 |
| Total Liquid | 4954 | 83.63 |
| Total Gas | 970 | 16.37 |
| PROPERTY DAMAGE | | |
| Yes | 174 | 2.94 |
| No | 1703 | 28.75 |
| Unknown | 4047 | 68.32 |
| ENVIRONMENTAL DAMAGE | | |
| Yes | 151 | 2.55 |
| No | 620 | 10.47 |
| Unknown | 5153 | 86.99 |
| AIR MEDIA AFFECTED | | |
| Yes | 1662 | 28.06 |
| No | 303 | 5.11 |
| Unknown | 3959 | 66.83 |
| WATER MEDIA AFFECTED | | |
| Yes | 910 | 15.36 |
| No | 2434 | 41.09 |
| Unknown | 2580 | 43.55 |
| LAND MEDIA AFFECTED | | |
| Yes | 3235 | 54.61 |
| No | 752 | 12.69 |
| Unknown | 1937 | 32.70 |
| HIGH TEMPERATURE | | |
| Yes | 87 | 1.96 |
| No | 794 | 17.87 |
| Unknown | 3559 | 80.10 |
| HIGH PRESSURE | | |
| Yes | 129 | 2.90 |
| No | 774 | 17.42 |
| Unknown | 3537 | 79.61 |

ENCYCLOPEDIA OF DATA
(Records with Spill or Vapor Release as Worst End Effect)

| | No. of Records | % of Total |
|---|---|---|
| EVACUATION? | | |
| Yes | 209 | 3.53 |
| No | 1082 | 18.26 |
| Unknown | 4633 | 78.21 |
| DEATHS? | | |
| Yes | 14 | 0.24 |
| No | 5456 | 92.10 |
| Unknown | 454 | 7.66 |
| INJURIES? | | |
| Yes | 286 | 4.83 |
| No | 4930 | 83.22 |
| Unknown | 694 | 11.72 |
| IN-PLANT | 4443 | 75.00 |
| IN-TRANSIT | 1481 | 25.00 |
| IN-PLANT LOCATION | | |
| Process Vessel | 516 | 11.61 |
| Storage Vessel | 923 | 20.77 |
| Valves/Pipes | 894 | 20.12 |
| Other | 1312 | 29.53 |
| Unknown | 798 | 17.96 |
| IN-PLANT CAUSE | | |
| Equipment Failure | 2101 | 47.29 |
| Operator Error | 553 | 12.45 |
| Upset Conditions | 134 | 3.02 |
| Fire | 95 | 2.14 |
| Other | 679 | 15.28 |
| Unknown | 881 | 19.83 |
| OPERATIONAL CONFIGURATION | | |
| Loading/Unloading | 740 | 16.66 |
| Steady State | 1501 | 33.78 |
| Start-Up | 39 | 0.88 |
| Shut Down | 21 | 0.47 |
| Maintenance | 104 | 2.34 |
| Other | 106 | 2.39 |
| Unknown | 1932 | 43.48 |
| IN-TRANSIT MODE | | |
| Truck | 832 | 56.18 |
| Rail | 548 | 37.00 |
| Barge | 35 | 2.36 |
| Pipeline | 35 | 2.36 |
| Other | 31 | 2.09 |

ENCYCLOPEDIA OF DATA
(Records with Spill or Vapor Release as Worst End Effect)

| | No. of Records | % of Total |
|---|---|---|
| IN-TRANSIT CAUSE | | |
| Leak | 626 | 42.27 |
| Collision | 294 | 19.85 |
| Other | 463 | 31.26 |
| Unknown | 98 | 6.62 |
| END EFFECTS | | |
| Spill | 4809 | 81.18 |
| Vapor Release | 1643 | 27.73 |
| Fire | 0 | 0.00 |
| Explosion | 0 | 0.00 |
| Other | 20 | 0.34 |
| PROCESS VESSEL AND: | | |
| Equipment Failure | 208 | 40.31 |
| Operator Error | 75 | 14.53 |
| Upset Conditions | 81 | 15.70 |
| Fire | 4 | 0.78 |
| Other | 70 | 13.57 |
| Unknown | 78 | 15.12 |
| STORAGE VESSEL AND: | | |
| Equipment Failure | 330 | 35.75 |
| Operator Error | 280 | 30.34 |
| Upset Conditions | 17 | 1.84 |
| Fire | 8 | 0.87 |
| Other | 143 | 15.49 |
| Unknown | 145 | 15.71 |
| VALVES/PIPES AND: | | |
| Equipment Failure | 618 | 69.13 |
| Operator Error | 101 | 11.30 |
| Upset Conditions | 6 | 0.67 |
| Fire | 0 | 0.00 |
| Other | 111 | 12.42 |
| Unknown | 58 | 6.49 |
| OTHER LOCATION AND: | | |
| Equipment Failure | 602 | 45.88 |
| Operator Error | 90 | 6.86 |
| Upset Conditions | 19 | 1.45 |
| Fire | 51 | 3.89 |
| Other | 273 | 20.81 |
| Unknown | 277 | 21.11 |

ENCYCLOPEDIA OF DATA
(Records with Spill or Vapor Release as Worst End Effect)

| | No. of Records | % of Total |
|---|---|---|
| PROCESS VESSEL AND: | | |
| Loading/Unloading | 19 | 3.68 |
| Steady State | 263 | 50.97 |
| Start-Up | 16 | 3.10 |
| Shut Down | 8 | 1.55 |
| Maintenance | 6 | 1.16 |
| Other | 2 | 0.39 |
| Unknown | 202 | 39.15 |
| STORAGE VESSEL AND: | | |
| Loading/Unloading | 388 | 42.04 |
| Steady State | 218 | 23.62 |
| Start-Up | 0 | 0.00 |
| Shut Down | 2 | 0.22 |
| Maintenance | 3 | 0.33 |
| Other | 46 | 4.98 |
| Unknown | 266 | 28.82 |
| VALVES/PIPES AND: | | |
| Loading/Unloading | 192 | 21.48 |
| Steady State | 271 | 30.31 |
| Start-Up | 14 | 1.57 |
| Shut Down | 1 | 0.11 |
| Maintenance | 55 | 6.15 |
| Other | 12 | 1.34 |
| Unknown | 349 | 39.04 |
| OTHER LOCATIONS AND: | | |
| Loading/Unloading | 81 | 6.17 |
| Steady State | 724 | 55.18 |
| Start-Up | 5 | 0.38 |
| Shut Down | 5 | 0.38 |
| Maintenance | 38 | 2.90 |
| Other | 35 | 2.67 |
| Unknown | 424 | 32.32 |

ENCYCLOPEDIA OF DATA
(Records with Spill or Vapor Release as Worst End Effect)

| | No. of Records | % of Total |
|---|---|---|
| SOURCES | | |
| CAL | 116 | |
| NJE | 92 | |
| NRC | 4392 | |
| OHE | 231 | |
| RG7 | 461 | |
| TXA | 427 | |
| CHP | 65 | |
| MMA | 0 | |
| NTP | 39 | |
| UPI | 67 | |
| LAT | 12 | |
| CHT | 2 | |
| NYT | 20 | |
| TOTAL RECORDS | 5924 | |

# APPENDIX G

## LIST OF EVENTS IN WHICH INJURIES OCCURRED

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/10/82 | NEWARK | NJ | McKesson Enviro-Systems | 0 | Solvent | 0 | | 0 | | P | 6 | 0 |
| 08/15/84 | DALLAS | TX | McLean Trucking | 15 | Acetic Acid | 0 | | 0 | | T | 3 | 0 |
| 06/13/84 | ROCHELLE | IL | Caron International | 150 | Acetic Acid | 0 | | 0 | | P | 1 | 0 |
| 02/29/84 | ALVIN | TX | Matlack Chemical | 0 | Acetic Acid | 0 | | 0 | | T | 1 | 0 |
| 08/30/83 | COLUMBIA | SC | Carolina Eastman Co. | 2363 | Acetic Acid | 0 | | 0 | | P | 4 | 0 |
| 07/03/81 | THORP | WI | Unknown | 127500 | Acetic Anhydride | 0 | | 0 | | T | 3 | 0 |
| 12/15/83 | LOS ANGELES | CA | United Parcel Service | 30 | Acetic Anhydride | 0 | | 0 | | P | 23 | 0 |
| 10/10/84 | GORMAN | CA | Unknown | 563 | Acetone | 0 | | 0 | | T | 1 | 0 |
| 03/07/85 | CHARLESTON | WV | Union Carbide | 5300 | Acetone | 100 | Mesityl Oxide | 0 | | P | 4 | 0 |
| 08/15/84 | SIMSBURY | CT | Ensign - Brickford Industries | 0 | Acetone/Nitric Acid | 0 | | 0 | | P | 0 | 3 |
| 11/03/83 | DETROIT | MI | A.G.A. Burdox Industrial Gases and Equipment | 0 | Acetylene | 0 | | 0 | | P | 3 | 0 |
| 04/09/81 | DETROIT | MI | Unknown | 0 | Acid | 0 | | 0 | | P | 19 | 0 |
| 06/22/81 | ELMHURST | NY | McLean Trucking | 413 | Acid | 0 | | 0 | | P | 12 | 0 |
| 02/24/85 | HILLSBROUGH | NJ | National Dinostics | 0 | Acrylamide | 0 | Diphenyloxazole | 0 | | P | 2 | 0 |
| 06/01/83 | GRACYVILLE | LA | Ent. Transportation Co. | 20 | Acrylic Acid | 0 | | 0 | | T | 2 | 0 |
| 03/13/85 | SANTA ANA | CA | Unknown | 413 | Acrylic Resin | 0 | | 0 | | T | 40 | 0 |
| 04/26/82 | AKRON | OH | Goodyear Tire and Rubber | 157500 | Acrylonitrile | 0 | | 0 | | P | 1 | 0 |
| 11/01/83 | FREEPORT | TX | Sohio Chem. | 0 | Acrylonitrile | 0 | | 0 | | T | 2 | 0 |
| 03/26/84 | TEXAS CITY | TX | Monsanto Co. | 50000 | Acrylonitrile | 0 | | 0 | | T | 2 | 0 |
| 01/03/82 | GALVESTON | TX | Unknown | 400000 | Acrylonitrile | 0 | | 0 | | T | 1 | 0 |
| 02/28/80 | DE SOTO | KS | Sunflower Army Ammunition Plant | 0 | Alcohol | 0 | | 0 | | P | 1 | 1 |
| 12/17/84 | MERCED | CA | Unknown | 300 | Alkali | 0 | Ferric Chloride | 0 | | T | 4 | 0 |
| 12/20/81 | TEXARKANA | TX | Unknown | 0 | Allyl Alcohol | 0 | | 0 | | T | 2 | 0 |
| 11/16/84 | NAUGATUCK | CT | C-line Inc. | 0 | Allyl Alcohol | 0 | | 0 | | T | 1 | 0 |
| 05/25/85 | KANSAS CITY | MO | Yellow Freight | 413 | Allyl Glycidylether | 0 | | 0 | | P | 2 | 0 |
| 09/24/81 | RARITAN TOWNSHIP | NJ | United States Metal Powders | 0 | Aluminum | 0 | | 0 | | P | 5 | 0 |
| 07/27/84 | HOUSTON | TX | Unknown | 23000 | Aluminum Phosphide | 0 | | 0 | | T | 8 | 1 |
| 02/18/85 | COLUMBUS | OH | City Products Corp. | 0 | Ammonia | 0 | | 0 | | P | 20 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/17/82 | LIMA | OH | Vistron | 0 | Ammonia | 0 | | 0 | | P | 1 | 0 |
| 08/06/84 | SUNNY VALE | CA | Unknown | 188 | Ammonia | 0 | | 0 | | P | 2 | 0 |
| 07/14/84 | FONTANA | CA | Lowe Ice Distributor | 1875 | Ammonia | 0 | | 0 | | P | 3 | 0 |
| 02/16/84 | SAN ANGELO | TX | Unknown | 0 | Ammonia | 0 | | 0 | | P | 1 | 0 |
| 02/13/84 | COLUMBIA | TX | Unknown | 250 | Ammonia | 0 | | 0 | | T | 2 | 0 |
| 07/17/84 | VERNON | CA | Delta Meat Packing | 2250 | Ammonia | 0 | | 0 | | P | 60 | 0 |
| 11/12/84 | BATESVILLE | AK | Arkansas Poultry | 0 | Ammonia | 0 | | 0 | | P | 35 | 0 |
| 05/29/85 | SAN ANTONIO | TX | Lone Star Ice House | 0 | Ammonia | 0 | | 0 | | P | 10 | 3 |
| 07/18/82 | BAYTOWN | TX | Chemical Exchange Refinery | 0 | Ammonia | 0 | | 0 | | P | 14 | 0 |
| 09/13/84 | DAYTON | WA | Inland Transportation Co. | 0 | Ammonia | 0 | | 0 | | T | 1 | 0 |
| 08/10/84 | SANTA ANA | CA | Unknown | 188 | Ammonium Chloride | 0 | | 0 | | P | 6 | 0 |
| 09/08/83 | CHERRYFIELD | ME | Cherryfield | 500 | Ammonium Sulfate | 0 | | 0 | | P | 1 | 0 |
| 08/17/84 | COLUMBUS | OH | Quality Bakery | 75 | Anhydrous Ammonia | 0 | | 0 | | P | 2 | 0 |
| 07/13/84 | MARION | OH | Union Tank Car Co. | 750 | Anhydrous Ammonia | 0 | | 0 | | T | 4 | 0 |
| 06/16/84 | | OH | Duane Martin Farm | 3750 | Anhydrous Ammonia | 0 | | 0 | | T | 0 | 1 |
| 06/02/84 | DOVER | OH | Roger Spies | 7500 | Anhydrous Ammonia | 0 | | 0 | | P | 1 | 0 |
| 07/20/83 | EDMUND | KS | Missouri Pacific | 0 | Anhydrous Ammonia | 0 | | 0 | | T | 1 | 0 |
| 08/07/83 | WICHITA | KS | Santa Fe Railroad | 30000 | Anhydrous Ammonia | 0 | | 0 | | T | 2 | 0 |
| 11/05/83 | ROSSWELL | NM | Petro Park Limited | 0 | Anhydrous Ammonia | 0 | | 0 | | P | 1 | 0 |
| 03/07/84 | ST JAMES PARRISH | LA | Agrico Chemical Co. | 1000 | Anhydrous Ammonia | 0 | | 0 | | T | 1 | 0 |
| 04/25/84 | UNDERWOOD | IA | W.R. Grace Co. | 3500 | Anhydrous Ammonia | 0 | | 0 | | T | 1 | 0 |
| 06/10/84 | NAPLES | IL | Norfolk & Western Railroad | 0 | Anhydrous Ammonia | 0 | | 0 | | T | 2 | 0 |
| 04/21/83 | ST LOUIS | MO | Anheuser Busch Inc. | 0 | Anhydrous Ammonia | 0 | | 0 | | P | 2 | 0 |
| 08/07/83 | MULBANE | KS | F.R.A. | 30000 | Anhydrous Ammonia | 0 | | 0 | | T | 2 | 0 |
| 08/05/83 | ESCONDIDO | CA | Industrial Chemicals | 413 | Anhydrous Ammonia | 0 | | 0 | | P | 1 | 0 |
| 08/10/83 | LONE WOLF | OK | Planters Co-op Association | 160000 | Anhydrous Ammonia | 0 | | 0 | | P | 1 | 0 |
| 08/30/83 | BERKLEY COUNTY | SC | Mobay Chemical | 1600 | Anhydrous Ammonia | 0 | | 0 | | P | 4 | 0 |
| 01/06/83 | PASADENA | TX | Occidental Chemical | 1343 | Anhydrous Ammonia | 0 | | 0 | | P | 3 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/07/84 | VISALIA | CA | Sequoia Feed | 188 | Anhydrous Ammonia | 0 | | 0 | | P | 1 | 0 |
| 11/11/84 | BURBANK | CA | Baskin-Robbins | 3750 | Anhydrous Ammonia | 0 | | 0 | | P | 9 | 0 |
| 11/14/84 | BURBANK | CA | Unknown | 563 | Anhydrous Ammonia | 0 | | 0 | | P | 3 | 0 |
| 12/02/84 | BURBANK | CA | Unknown | 188 | Anhydrous Ammonia | 0 | | 0 | | P | 1 | 0 |
| 01/12/85 | ONTARIO | CA | Unknown | 187 | Anhydrous Ammonia | 0 | | 0 | | P | 10 | 0 |
| 12/08/84 | BRENTWOOD | MO | Ice Cream Specialties | 0 | Anhydrous Ammonia | 0 | | 0 | | P | 2 | 0 |
| 11/09/83 | DANVILLE | IN | Hendricks County Farm Bu. Co-op. | 11250 | Anhydrous Ammonia | 0 | | 0 | | P | 4 | 0 |
| 06/11/81 | BARNESVILLE | MN | Farmland Industries | 100000 | Anhydrous Ammonia | 0 | | 0 | | P | 30 | 0 |
| 09/09/83 | ORANGEBURG | SC | Royster Transport Co. | 0 | Anhydrous Ammonia | 0 | | 0 | | T | 1 | 0 |
| 05/17/84 | VINELAND | CO | Phillips Chemical Co. | 15000 | Anhydrous Ammonia | 0 | | 0 | | T | 26 | 0 |
| 05/31/84 | KINDRICK | ID | George F. Brocke & Son Co. | 5000 | Anhydrous Ammonia | 0 | | 0 | | T | 1 | 0 |
| 07/30/84 | NOLA | LA | Unknown | 0 | Anhydrous Ammonia | 0 | | 0 | | T | 1 | 0 |
| 01/16/84 | EREA | CA | Union Chemical Oil Co. | 2000 | Anhydrous Ammonia | 0 | | 0 | | P | 1 | 0 |
| 10/20/83 | ST. JAMES PARRISH | LA | Gulf Central Pipeline Co. | 100 | Anhydrous Ammonia | 0 | | 0 | | T | 3 | 0 |
| 09/21/83 | LAMPASAS | TX | Ralston Purina | 3750 | Anhydrous Ammonia | 0 | | 0 | | P | 1 | 0 |
| 02/17/83 | INGLESIDE | TX | Dupont | 12000 | Anhydrous Hydrochloric Acid | 50 | Chlorine | 0 | | P | 3 | 0 |
| 11/25/84 | ELIZABETH | NJ | Union Carbide | 0 | Anhydrous Trimethylamine | 0 | | 0 | | T | 2 | 0 |
| 05/12/84 | HEATH | OH | Koppers Refinery | 0 | Asphalt | 0 | | 0 | | P | 1 | 0 |
| 10/10/84 | PISCATAWAY | NJ | Ziegler Chemical Co. | 0 | Asphalt | 0 | Naptha | 0 | | P | 1 | 0 |
| 05/27/85 | VENTURA | CA | Unknown | 0 | Atrazine | 0 | Triazole | 0 | | T | 3 | 0 |
| 01/16/85 | LOS ANGELES | CA | Rocket-Dyne | 0 | Azidodinitroethane | 0 | | 0 | | P | 4 | 0 |
| 06/25/84 | ELDERTON | PA | Chem Leaman Tankline Inc. | 0 | Benzene | 0 | | 0 | | T | 1 | 0 |
| 01/27/83 | MIDLAND | TX | Unknown | 0 | Benzene | 0 | | 0 | | T | 1 | 0 |
| 06/20/83 | BATON ROUGE | LA | Exxon USA | 300 | Benzene | 0 | | 0 | | P | 1 | 0 |
| 09/20/84 | SUNNY VALE | CA | Unknown | 225 | Benzyl Bromoacetate | 0 | | 0 | | P | 1 | 0 |
| 08/17/84 | FLEMINGTON | NJ | Penn-Color Warehouse | 0 | Bromochloroethane | 0 | Benzene | 0 | | P | 0 | 0 |
| 04/15/82 | NIMISHALA TWP. | OH | Eslich Wrecking Co. | 0 | Butadiene | 0 | | 0 | | P | 1 | 0 |
| 08/07/80 | HOUSTON | TX | Unknown | 0 | Butadiene | 0 | | 0 | | T | 5 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/13/84 | HILLSBROUGH | NJ | Lehn and Fink | 0 | Butane | 0 | | 0 | | P | 4 | 0 |
| 12/26/80 | BROUSSARD | LA | Unknown | 3750 | Butane | 0 | | 0 | | P | 3 | 0 |
| 12/01/84 | RAHWAY | NJ | Ritter Transportation | 0 | Butane Mercaptan | 0 | | 0 | | T | 2 | 0 |
| 09/11/84 | AZUSA | CA | Unknown | 5000 | Butyl Acetate | 0 | | 0 | | P | 4 | 0 |
| 10/01/83 | MOBILE | AL | Commercial Industrial Chemical | 0 | Calcium Chlorine | 0 | Sodium | 0 | Metabisulfate | T | 1 | 0 |
| 11/26/80 | MENDOTA | CA | Unknown | 38 | Carbolic Acid | 0 | Gasoline | 0 | | T | 0 | 1 |
| 01/11/84 | RIDGEVILLE | SC | SC Electric and Gas Co. | 0 | Carbon Dioxide | 0 | | 0 | | P | 4 | 0 |
| 11/15/82 | AKRON | OH | Goodyear Tire and Rubber | 3000 | Carbon Disulfide | 0 | | 0 | | P | 8 | 0 |
| 07/18/81 | NEW ORLEANS | LA | Unknown | 825 | Carbon Disulfide | 0 | | 0 | | T | 1 | 0 |
| 08/24/84 | FILLMORE | CA | Unknown | 1000 | Carboxin | 0 | Thiram | 0 | | T | 2 | 0 |
| 02/18/82 | DAYTON | OH | Mark Exterminating | 750 | Chlordane | 0 | | 0 | | P | 0 | 0 |
| 05/13/83 | CAMDEN | NJ | Unknown | 0 | Chlordane | 0 | | 0 | | P | 1 | 0 |
| 01/13/83 | EL DORADO | AR | Ensco Inc. | 1350000 | Chlorinated Hydrocarbons | 0 | | 0 | | P | 1 | 0 |
| 10/22/84 | SAN JOSE | CA | Raisch Construction Co. | 413 | Chlorinated Rubber Chromate | 0 | | 0 | | P | 2 | 0 |
| 11/22/83 | INDIANAPOLIS | IN | Detrex Chemicals | 7500 | Chlorinated Solvents | 0 | | 0 | | T | 1 | 0 |
| 02/18/85 | LAKE CO | OH | CALHIO Chemical | 113 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 10/26/83 | MANSFIELD | OH | Jim Cousins Inc. | 200 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 04/11/85 | UNION BEACH | NJ | IFF International | 0 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 11/28/84 | AGOURA | CA | Unknown | 150 | Chlorine | 0 | | 0 | | P | 7 | 0 |
| 10/14/83 | FT. WAYNE | IN | Jones Chemicals Inc. | 1000 | Chlorine | 0 | | 0 | | P | 6 | 0 |
| 11/15/83 | DEER PARK | TX | Shell Oil Co. | 1000 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 11/21/83 | CLEVELAND | OH | Clorox Co. | 78 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 12/21/83 | TACOMA | WA | Penwalt Corp. | 25 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 12/23/83 | ST. GABRIEL | LA | Stauffer Chem. | 3000 | Chlorine | 0 | | 0 | | P | 12 | 0 |
| 02/24/84 | NITRO | WV | Monsanto Co. | 0 | Chlorine | 0 | | 0 | | P | 8 | 0 |
| 03/09/84 | COMMERCE CITY | CO | Dixie Petro-Chem Inc. | 30 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 03/23/84 | LONGVIEW | TX | Dixie Petrochem Co. | 175 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 05/02/84 | OAKLAND | CA | Olympic Chemical | 0 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 05/02/84 | OAKLAND | CA | Schnitzer Steel Co. | 188 | Chlorine | 0 | | 0 | | P | 25 | 0 |
| 05/27/84 | TAMPA | FL | McKesson Chemical Co. | 0 | Chlorine | 0 | | 0 | | P | 2 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 06/08/84 | NIAGRA FALLS | NY | Occidental Chemical Co. | 0 | Chlorine | 0 | | 0 | | P | 3 | 0 |
| 03/01/83 | CHARLESTON | WV | FMA Corp. | 225 | Chlorine | 0 | | 0 | | P | 3 | 1 |
| 03/08/83 | CHICKAMUGA PARK | GA | PBS Chemical | 1 | Chlorine | 0 | | 0 | | T | 1 | 0 |
| 03/11/83 | LAKE CHARLES | LA | PPG Industries | 0 | Chlorine | 0 | | 0 | | P | 4 | 0 |
| 04/22/83 | FREEPORT | TX | Dow Chemical | 0 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 08/08/83 | GEISMAR | LA | Borden Chemical | 1000 | Chlorine | 0 | | 0 | | P | 0 | 0 |
| 08/11/83 | LONGVIEW | TX | Texas Eastman Co. | 250 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 09/07/83 | MILPETAS | CA | Jones Chemicals | 50 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 08/07/84 | BATON ROUGE | LA | Allied Chemical Corp. | 500 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 10/30/84 | UNION CITY | CA | Unknown | 25 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 11/02/84 | SAN JOSE | CA | Printed Circuit Technology | 5 | Chlorine | 0 | | 0 | | P | 4 | 0 |
| 02/18/84 | RAHWAY | NJ | Rahway Sewage Authority | 1500 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 06/14/84 | | | Morristown Sewage Treatment Plant | 0 | Chlorine | 0 | Hydrochloric Acid | 0 | Calcium Hypochlorite | P | 1 | 0 |
| 10/29/84 | EASTOVER | SC | Union Camp Corp. | 500 | Chlorine | 0 | | 0 | | P | 11 | 0 |
| 11/08/84 | AXIS | AL | Stauffer Chemical | 1000 | Chlorine | 0 | | 0 | | P | 1 | 0 |
| 04/09/83 | KNOXVILLE | TN | Kuwahee Sewage Treatment | 0 | Chlorine | 0 | Hypochlorite | 0 | Ferric Chloride | P | 4 | 0 |
| 06/01/81 | GEISMAR | LA | BASF Wyandotte Corp. | 0 | Chlorine | 0 | | 0 | | P | 140 | 0 |
| 05/13/85 | ASHLAND | AL | Spring Valley Poultry Processing | 0 | Chlorine | 0 | | 0 | | P | 27 | 0 |
| 04/10/82 | BELLE | WV | Diamond Shamrock Corp. | 0 | Chlorine | 0 | | 0 | | P | 11 | 0 |
| 10/31/82 | NIAGARA FALLS | NY | E.I. DuPont de Nemours and Co. | 2000 | Chlorine | 0 | | 0 | | P | 76 | 1 |
| 10/26/83 | HENDERSON | NV | Jones Chemical Co. | 2000 | Chlorine | 0 | | 0 | | P | 3 | 0 |
| 06/06/84 | INDEPENDENCE | MO | Unknown | 0 | Chlorine | 0 | Calcium Hypochlorite | 0 | Naptha | T | 1 | 0 |
| 08/07/84 | OMAHA | NE | Asarco Inc. | 320 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 02/29/84 | RICHMOND | VA | AT&T Tech Systems | 0 | Chlorine | 0 | | 0 | | P | 2 | 0 |
| 01/21/84 | SOMERSET COUNTY | ME | Fd. Warren Co. | 100 | Chlorine | 0 | | 0 | | P | 3 | 0 |
| 09/03/83 | BIRMINGHAM | AL | Southern Railway | 0 | Chlorine | 0 | | 0 | | T | 1 | 0 |
| 09/08/83 | HENDERSON | KY | PBS Chemical | 150 | Chlorine | 0 | | 0 | | P | 2 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/16/84 | SANTA BARBARA | CA | Unknown | 0 | Chloropicrin | 0 | | 0 | | T | 1 | 0 |
| 07/11/83 | LAPLACE | LA | E.I. DuPont de Nemours and Co. | 0 | Chloroprene | 0 | | 0 | | P | 21 | 0 |
| 06/13/84 | TWINSBURG | OH | Peters Supply Co. | 550 | Chromic Acid | 55 | Potassium Ferricyanide | 55 | Potassium Ferrocyanide | P | 2 | 0 |
| 03/30/83 | STATE COLLEGE | PA | Roadway Express | 263 | Cleaning Compound | 0 | | 0 | | T | 1 | 0 |
| 08/16/84 | CLEVELAND | OH | Mobile Tank Car Services | 0 | Coal Tar | 0 | Light Oil | 0 | | T | 21 | 2 |
| 03/23/83 | MANSFIELD | OH | Synder Transport | 0 | Coal Tar Dye | 0 | | 0 | | T | 1 | 0 |
| 11/18/83 | KENT | WA | Bower Transportation | 0 | Corrosive Material | 0 | | 0 | | T | 1 | 0 |
| 05/22/81 | CHICAGO | IL | Clipper Express Co. | 413 | Cresylic Acid | 0 | | 0 | | P | 28 | 0 |
| 08/26/81 | GOOD HOPE | LA | GATX Terminals | 0 | Crude Oil | 0 | | 0 | | P | 1 | 0 |
| 07/08/77 | FAIRBANKS | AK | Unknown | 0 | Crude Oil | 0 | | 0 | | T | 6 | 1 |
| 04/19/85 | NORCO | LA | Shell Oil Co. | 0 | Crude Oil | 0 | | 0 | | P | 9 | 0 |
| 06/29/84 | BRIDGEPORT | CA | Unknown | 563 | Cyanide | 0 | | 0 | | T | 1 | 0 |
| 01/09/81 | LOS ANGELES | CA | Mendelson and Assoc. | 0 | Cyanide | 0 | | 0 | | P | 19 | 0 |
| 11/16/83 | LATEX | LA | Kansas City - Southern Railroad | 52500 | Cypernethren | 0 | Diesel Fuel | 0 | | T | 6 | 0 |
| 07/06/83 | GEISMAR | LA | Keystone Shipping | 2053 | Dichloromethane | 0 | | 0 | | P | 4 | 0 |
| 07/03/84 | INDUSTRY | CA | Unknown | 413 | Dicyamideamine | 0 | | 0 | | P | 2 | 0 |
| 08/31/84 | SANGER | TX | Unknown | 0 | Diethylamine | 0 | Antimony Trioxide | 0 | | T | 11 | 0 |
| 07/07/81 | BOGALUSA | LA | Crown Zellerbach Paper and Chemical Corp. | 0 | Dimethyl Sulfoxide | 0 | | 0 | | P | 3 | 0 |
| 10/12/84 | JACKSON TOWNSHIP | OH | McLean Trucking Co. | 413 | Dimethylamine | 0 | | 0 | | T | 5 | 0 |
| 06/21/83 | MIDDLEBURG | CT | 1-Call Motor Freight | 10 | Dimethylamine | 0 | | 0 | | T | 1 | 0 |
| 06/19/84 | CRANBERRY TWP. | NJ | Cordoba Helicopter Enterprises Inc. | 0 | Endosulfan | 0 | Pydrin | 0 | | T | 1 | 0 |
| 07/21/83 | MT. PLEASANT | PA | Matlack Inc. | 150 | Epoxy Resin | 0 | | 0 | | T | 1 | 0 |
| 06/17/85 | HOPEWELL | NJ | American Surfacing Co. Inc. | 0 | Ethyl Acetate | 0 | Polyurethane Binder | 0 | | P | 0 | 1 |
| 03/15/84 | WALLRIDGE | OH | Coastal Tank Lines | 113 | Ethyl Acrylate | 0 | | 0 | | P | 1 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/30/83 | LINCOLN | IN | Liquid Transportation | 1 | Ethyl Acrylate | 0 | | 0 | | T | 1 | 0 |
| 09/12/83 | S. HACKENSACK | NJ | Dr. Madis Laboritories, Inc. | 0 | Ethyl Alcohol | 0 | | 0 | | P | 7 | 0 |
| 06/09/81 | FT. MADISON | IA | Chevron Chemical Co. | 7500 | Ethylamine | 0 | | 0 | | P | 1 | 1 |
| 10/13/81 | FREEPORT | TX | Dow Chemical Co. | 0 | Ethylene | 0 | Polyethylene | 0 | | P | 7 | 6 |
| 11/12/82 | IRVINE | CA | Bentley Labs | 0 | Ethylene Oxide | 0 | Freon | 0 | | P | 77 | 0 |
| 02/09/80 | WALNUT RIDGE | AR | Unknown | 0 | Ethylene Oxide | 0 | Ethylene Chloride | 0 | Vinyl Chloride | T | 1 | 0 |
| 07/30/81 | GRANTSVILLE | VT | Mining Services International | 0 | Explosives | 0 | | 0 | | P | 0 | 5 |
| 05/27/83 | BENTON | TN | Webb Bait Farm | 0 | Explosives | 0 | | 0 | | P | 1 | 11 |
| 11/26/83 | BALLPORT | NY | New York Pyrotechnic Inc. | 0 | Explosives | 0 | | 0 | | P | 23 | 2 |
| 03/01/84 | PROMONTORY | UT | Morton-Thiokol Corp. | 0 | Explosives | 0 | | 0 | | P | 14 | 0 |
| 04/25/83 | CHEBANSE | IL | Amoco Oil Co., Fertilizer Division | 142500 | Fertilizer | 50 | Anhydrous Ammonia | 0 | | P | 4 | 0 |
| 09/03/80 | ORANGE | CA | Robinson Fertilizer Co. | 0 | Fertilizer | 0 | Pesticide | 0 | | P | 2 | 0 |
| 04/22/80 | FORT HALL INDIAN RES | ID | Russett Chemical Co. | 0 | Fertilizer | 0 | Pesticides | 0 | | P | 29 | 0 |
| 06/15/83 | CENTERVILLE | VA | Unknown | 8250 | Fertilizer | 0 | | 0 | | T | 1 | 0 |
| 06/25/85 | HALLETT | OK | Aerlex Fireworks Co. | 0 | Fireworks | 0 | | 0 | | P | 0 | 0 |
| 11/24/84 | ADAMS | MA | Adams Paint Works | 0 | Flammable Chemicals | 0 | | 0 | | P | 0 | 0 |
| 11/25/80 | KENNER | LA | Mobil Oil Co. | 0 | Flammable Liquid | 0 | | 0 | | T | 2 | 7 |
| 02/12/83 | ALBUQUERQUE | NM | Road Way Express | 63 | Flammable Liquid | 0 | | 0 | | T | 5 | 0 |
| 06/30/84 | ELLENWOOD | GA | Consolidated Freightways | 0 | Flammable Material | 0 | | 0 | | P | 2 | 0 |
| 09/13/84 | LACEY | WA | Chemical Waste Management | 0 | Flue Dust | 0 | | 0 | | T | 1 | 0 |
| 09/06/84 | MONTEREY | CA | Unknown | 37710 | Formaldehyde | 0 | | 0 | | T | 1 | 0 |
| 08/11/83 | HOUSTON | TX | Unknown | 0 | Formaldehyde | 0 | | 0 | | T | 1 | 0 |
| 08/10/84 | LINDWOOD | NJ | Unknown | 0 | Freon | 0 | | 0 | | P | 10 | 0 |
| 09/05/84 | ANTHONY | KS | Farmers Oil Co. | 0 | Fuel | 0 | | 0 | | P | 3 | 2 |
| 07/18/76 | BIG SPRING | TX | Unknown | 0 | Fuel Oil | 0 | | 0 | | P | 10 | 0 |
| 01/20/80 | BORGER | TX | Phillips Petroleum | 0 | Fuel Oil | 0 | Crude Oil | 0 | | P | 40 | 0 |
| 09/01/83 | CHALMETTE | LA | Tenneco Oil Refinery | 900000 | Gasoline | 0 | | 0 | | P | 24 | 1 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/03/79 | TORRANCE | CA | Mobil Oil | 0 | Gasoline | 0 | Butane | 0 | | P | 0 | 3 |
| 08/11/80 | ELYSIAN PARK | CA | Unknown | 0 | Gasoline | 0 | | 0 | | T | 1 | 0 |
| 06/23/84 | HIALEAH | FL | Unknown | 60000 | Gasoline | 0 | | 0 | | T | 0 | 1 |
| 08/14/80 | MORGAN CITY | LA | Texaco Oil Co. | 0 | Gasoline | 0 | Diesel Fuel | 0 | | P | 10 | 0 |
| 08/23/80 | MADISONVILLE | LA | Stokes Oil Co. | 0 | Gasoline | 0 | | 0 | | P | 1 | 1 |
| 09/07/80 | ALBANY | NY | Mobil Oil Corp. | 0 | Gasoline | 0 | | 0 | | P | 10 | 0 |
| 08/15/80 | HONOLULU | HI | Shell Oil Co | 0 | Gasoline | 0 | | 0 | | P | 2 | 0 |
| 11/14/81 | CANON CITY | CO | Unknown | 0 | Gasoline | 0 | | 0 | | T | 6 | 7 |
| 08/27/80 | CHICAGO | IL | Illinois Warehouse Corp. | 0 | Hazardous Waste | 0 | | 0 | | P | 7 | 0 |
| 09/14/83 | EAST LOS ANGELES | CA | Unknown | 340000 | Hazardous Waste | 0 | | 0 | | T | 3 | 0 |
| 01/01/82 | CANTON | OH | Canton Park Dept. | 0 | Herbicide | 0 | | 0 | | T | 0 | 0 |
| 04/11/85 | RUPERT | ID | Unknown | 0 | Herbicide | 0 | | 0 | | T | 10 | 0 |
| 08/31/83 | NOLA | LA | Unknown | 0 | Hexachlorocyclopentadiene | 0 | | 0 | | P | 3 | 0 |
| 01/21/85 | WALL TOWNSHIP | NJ | Selective Coatings Inc. | 0 | Hexane | 0 | Isopropyl Acetate | 0 | Toluene | T | 1 | 0 |
| 07/28/83 | SANBORN | IA | Dahleen Transportation | 0 | Hexane | 0 | | 0 | | T | 2 | 1 |
| 02/13/81 | LOUISVILLE | KY | Ralston Purina | 1125 | Hexane | 0 | | 0 | | P | 4 | 0 |
| 05/10/84 | PEABODY | MA | Henry Leather Co. | 0 | Hydrocarbons | 0 | Benzene | 0 | Lacquer | P | 125 | 1 |
| 08/24/83 | SCOTT CO. | IA | Thompson Hayward | 375 | Hydrochloric Acid | 0 | | 0 | | T | 2 | 0 |
| 06/28/84 | BEAUMONT | TX | Mobil Chemical | 11250 | Hydrochloric Acid | 0 | | 0 | | P | 1 | 0 |
| 03/10/83 | MILWAUKEE | WI | Hercules Inc. | 0 | Hydrochloric Acid | 0 | | 0 | | P | 1 | 0 |
| 10/02/84 | ONTARIO | CA | United Parcel Service | 8 | Hydrochloric Acid | 0 | | 0 | | T | 7 | 0 |
| 07/12/84 | EL TORO | CA | Unknown | 263 | Hydrochloric Acid | 0 | | 0 | | T | 19 | 0 |
| 07/23/84 | RIVERSIDE | NJ | Riverside Metals Co. | 0 | Hydrochloric Acid | 0 | Acetone | 0 | | P | 0 | 0 |
| 11/20/81 | RESERVE | LA | Jones Chemical | 6000 | Hydrochloric Acid | 0 | | 0 | | P | 2 | 0 |
| 12/11/83 | BURBANK | CA | Andrew Jergens Ca. | 0 | Hydrochloric Acid | 0 | | 0 | | P | 3 | 0 |
| 02/17/81 | HUNTINGTON PARK | CA | Cyclo Chemical | 0 | Hydrochloric Acid | 0 | | 0 | | P | 80 | 0 |
| 04/27/81 | FONTANA | CA | Unknown | 0 | Hydrochloric Acid | 0 | | 0 | | T | 21 | 0 |
| 06/01/84 | RIVERSIDE | CA | Culligan Water Co. | 1500 | Hydrochloric Acid | 0 | | 0 | | P | 4 | 0 |
| 05/24/85 | EASTLAND | TX | Missouri Pacific Railroad | 0 | Hydrochloric Acid | 0 | Anhydrous Hydrogen | 0 | Sulfuric Acid | T | 15 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/02/80 | WOODS CROSS | VT | Phillips Petroleum | 0 | Hydrochloric Acid | 0 | Crude Oil | 0 | Gasoline | P | 8 | 0 |
| 08/18/82 | ELIZABETH | NJ | L.J. & M La Place Industrial Chem. | 37500 | Hydrochloric Acid | 0 | | 0 | | T | 32 | 0 |
| 01/12/84 | MILPITAS | CA | Arrowhead Industrial Waters | 113 | Hydrochloric Acid | 0 | | 0 | | P | 1 | 0 |
| 02/12/84 | TRICE | UT | Unknown | 23000 | Hydrochloric Acid | 0 | | 0 | | T | 1 | 0 |
| 04/09/84 | MULLINS | WV | B.J. Huges Services | 2300 | Hydrochloric Acid | 0 | | 0 | | T | 1 | 0 |
| 03/09/83 | BEAUMONT | TX | Transport Company of Texas | 45375 | Hydrochloric Acid | 0 | | 0 | | T | 2 | 0 |
| 07/05/83 | MOB | NM | BJ - Hughes Service | 37450 | Hydrochloric Acid | 0 | | 0 | | T | 1 | 0 |
| 08/01/83 | IRVINE | CA | Unknown | 15 | Hydrochloric Acid | 0 | | 0 | | T | 3 | 0 |
| 04/12/83 | CLEVELAND | OH | Alchem-tron Inc. | 0 | Hydrofluoric Acid | 0 | Nitric Acid | 0 | Lime | P | 1 | 0 |
| 02/01/84 | | NJ | Hercules Powder Plant | 0 | Hydrogen | 0 | | 0 | | P | 0 | 0 |
| 11/11/82 | WESTLAKE | LA | Olin Corp | 0 | Hydrogen | 0 | | 0 | | P | 1 | 0 |
| 03/25/84 | RAHWAY | NJ | Unique Precision Metals | 0 | Hydrogen Cyanide | 0 | | 0 | | P | 5 | 0 |
| 02/05/85 | ELKHART | IN | Conrail Railroad | 0 | Hydrogen Fluoride | 0 | | 0 | | T | 0 | 0 |
| 01/23/83 | CUMBERLAND | MD | Chessie Systems Railroad | 0 | Hydrogen Sulfide | 0 | | 0 | | T | 4 | 0 |
| 04/15/84 | MIDLAND | TX | Unknown | 0 | Hydrogen Sulfide | 0 | | 0 | | P | 6 | 0 |
| 01/08/84 | RICHMOND | CA | Chevron USA Inc. | 38 | Hydrogen Sulfide | 38 | Ammonia | 0 | | P | 78 | 0 |
| 01/13/82 | UTICA | MI | Liquid Disposal Corp. | 0 | Hydrogen Sulfide | 0 | | 0 | | P | 15 | 2 |
| 07/06/85 | COMANCHE | IA | Hawkeye Chemical | 0 | Hydrogen/Nitrogen | 0 | | 0 | | P | 7 | 0 |
| 08/20/84 | INDIANAPOLIS | IN | C.R.S.T INC. | 75 | Insecticide | 0 | | 0 | | T | 1 | 0 |
| 05/09/84 | FREEMONT | CA | Unknown | 750 | Insecticide | 0 | | 0 | | T | 2 | 0 |
| 02/21/85 | ELIZABETH | NJ | N.Y. Bronze Powder Corp. | 0 | Isobutane | 0 | Phosgene | 0 | Hydrochloric Acid | P | 19 | 0 |
| 07/27/84 | BETHLEHEM | PA | Joseph Ayers Co. | 0 | Isopropyl Alcohol | 0 | Hydrocarbons | 0 | | P | 3 | 1 |
| 07/31/84 | ARLINGTON | VA | Unknown | 1700 | Kelthane 35 | 1700 | Melathyone | 0 | | T | 1 | 0 |
| 07/24/80 | QUEENS | NY | Unknown | 0 | Lacquer | 0 | | 0 | | P | 40 | 4 |
| 08/23/83 | ROBINS | GA | Brown Transport | 90 | Lacquer | 0 | | 0 | | T | 3 | 0 |
| 12/08/83 | OWATONNA | MN | General Battery Corp. | 0 | Lead Acid Batteries | 0 | | 0 | | T | 1 | 0 |
| 05/30/78 | TEXAS CITY | TX | Unknown | 0 | Light Hydrocarbons | 0 | Hydrocarbons | 0 | | P | 10 | 5 |
| 02/04/82 | SALEM | OH | Dow Chemical | 0 | Liquid Nitrogen | 0 | | 0 | | T | 1 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/16/84 | SAN CARLOS | CA | Liquid Carbonics | 25 | Lithium Hydride | 0 | | 0 | | P | 1 | 0 |
| 06/11/84 | ST LOUIS | MO | Monsanto | 27500 | M-Xylene | 0 | | 0 | | P | 2 | 0 |
| 12/20/83 | EAST CAMDEN | AR | Tracor-MBA | 0 | Magnesium | 0 | | 0 | | P | 21 | 1 |
| 10/06/84 | LINDEN | NJ | American Cyanamid and Chemical Co. | 0 | Malathion | 0 | | 0 | | P | 161 | 0 |
| 06/27/85 | THERMAL | CA | Wilbur Ellis Co. | 0 | Malathion | 0 | Paraquat | 0 | Methyl Bromide | P | 90 | 0 |
| 06/07/84 | ST. LOUIS | MO | Slay Transport | 0 | Maleic Anhydride | 0 | | 0 | | P | 1 | 1 |
| 08/01/84 | MIAMI TOWNSHIP | OH | Gulf Oil | 0 | Mercaptan | 0 | | 0 | | P | 1 | 0 |
| 07/21/83 | BEACON FALLS | PA | Chippewa Township Sewage Treatment | 0 | Methane | 0 | Chlorine | 0 | | P | 9 | 2 |
| 02/02/82 | LIMA | OH | Vistron | 0 | Methyl Acrylate | 0 | Acrylonitrile | 0 | | P | 1 | 1 |
| 12/22/82 | VERNON | CA | Unknown | 413 | Methyl Acrylate | 0 | | 0 | | P | 355 | 0 |
| 03/22/85 | BROOKLYN PARK | MD | Matlack Inc. | 750 | Methyl Acrylate | 0 | | 0 | | P | 20 | 0 |
| 12/11/84 | REED SPRINGS | MO | Rantzels | 0 | Methyl Alcohol | 0 | Toluene | 0 | Cyanide | P | 12 | 0 |
| 09/17/84 | LOCKPORT | LA | X-Chem Inc. | 55500 | Methyl Alcohol | 0 | | 0 | | T | 2 | 0 |
| 10/03/83 | HOUSTON | TX | J. Chemical Co. | 30000 | Methyl Bromide | 0 | Malathion | 0 | | P | 5 | 2 |
| 06/24/85 | ANAHEIM | CA | Larry Fricken Co. | 0 | Methyl Bromide | 0 | Organophosphates | 0 | Ammonium Nitrate | P | 12 | 0 |
| 07/28/83 | NEW YORK | NY | Greenburg Associates | 30 | Methyl Chloroform | 0 | | 0 | | P | 31 | 0 |
| 11/19/82 | HAMILTON CO. | OH | Ohio Valley Graphic Ink Co. | 0 | Methyl Ethyl Ketone | 0 | | 0 | | P | 0 | 1 |
| 04/19/85 | DOVER | NJ | J.C. Curtis | 0 | Methyl Ethyl Ketone | 0 | Phosgene | 0 | Hydrogen Cyanide | P | 80 | 0 |
| 01/27/83 | PASADENA | TX | Celanese Chemical Co. | 50 | Methyl Iodide | 0 | | 0 | | P | 2 | 0 |
| 11/15/84 | MIDDLEPORT | NY | FMC Corp. | 0 | Methyl Isocyanate | 0 | | 0 | | P | 110 | 0 |
| 06/01/84 | BARBERTON | OH | PPG Industries | 0 | Methyl Mercaptan | 0 | | 0 | | P | 0 | 0 |
| 05/30/85 | CARLSTADT | NJ | 610 Plastic Corp. | 0 | Methyl Methacrylate | 0 | | 0 | | P | 5 | 0 |
| 06/13/83 | SOUTH HACKENSACK | NJ | Caloric Chemical | 413 | Methyl Methacrylate | 0 | | 0 | | P | 4 | 0 |
| 04/25/85 | SANTA ANA | CA | Unknown | 188 | Methylene Chloride | 0 | | 0 | | P | 2 | 0 |
| 06/03/81 | MILLFORD | CT | Connecticut Aerosols | 0 | Methylene Chloride | 0 | | 0 | | P | 30 | 0 |
| 03/09/83 | METIRIE | LA | Shell Oil Co. | 0 | Methylmercaptan | 0 | | 0 | | P | 1 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08/03/84 | IRVINE | CA | Unknown | 19 | Monoethanolamine | 0 | | 0 | | T | 9 | 0 |
| 10/08/84 | EL CENTRO | CA | Unknown | 188 | Morphine | 0 | | 0 | | T | 5 | 0 |
| 04/05/85 | MYRTLE BEACH | SC | Arnold's Pool Service | 24375 | Muriatic Acid | 24375 | Sodium Hydrochloric Acid | 0 | | P | 10 | 0 |
| 10/20/83 | BOCA RATON | FL | Unknown | 0 | Muriatic Acid | 1500 | Hydrochloric Acid | 0 | | P | 2 | 0 |
| 06/25/84 | FLINT | MI | Buick Div. of GM | 563 | Nalco 324 | 0 | | 0 | | P | 1 | 0 |
| 06/07/83 | BATON ROUGE | LA | Unknown | 0 | Naphtha | 0 | | 0 | | T | 2 | 0 |
| 09/03/81 | MARRERO | LA | Celotex Corp. | 0 | Naphtha Asphalt | 0 | | 0 | | P | 13 | 1 |
| 07/07/84 | VICTORVILLE | CA | Unknown | 188 | Nitric Acid | 0 | | 0 | | T | 1 | 0 |
| 04/04/83 | DENVER | CO | Denver and Rio Grande Western Railroad | 150000 | Nitric Acid | 0 | | 0 | | T | 8 | 0 |
| 06/02/82 | GULFPORT | MS | Plastifax Corp. | 0 | Nitric Acid | 0 | | 0 | | P | 61 | 3 |
| 07/22/83 | N. KANSAS CITY | MO | Exhibitors Film Delivery | 8 | Nitric Acid | 0 | | 0 | | T | 16 | 0 |
| 03/25/84 | GEISMAR | LA | Rubicon Chemical Co. | 8 | Nitric Acid | 0 | | 0 | | P | 1 | 0 |
| 07/19/83 | WESTLAKE | LA | Matlack Inc. | 150 | Nitric Acid | 0 | | 0 | | P | 1 | 0 |
| 02/21/85 | SAYREVILLE | NJ | Hercules Powder Plant | 0 | Nitrocellulose | 0 | | 0 | | P | 5 | 1 |
| 11/29/83 | SAYREVILLE | NJ | Hercules Inc. | 100 | Nitrocellulose | 0 | Ethyl Alcohol | 0 | | P | 5 | 0 |
| 03/16/84 | RICHMOND | RI | Carol Products Co. | 0 | Nitrogen | 0 | Hydrochloric Acid | 0 | Sulfuric Dioxide | P | 35 | 0 |
| 01/16/85 | MELBOURNE | IA | Iowa River Farm Service | 21750 | Nitrogen Fertilizer | 0 | | 0 | | P | 1 | 0 |
| 09/02/83 | EAST LOS ANGELES | CA | Unknown | 3000 | Nitrogen Fertilizer | 0 | | 0 | | T | 4 | 0 |
| 05/13/82 | COLUMBUS | OH | G.F. Smith Chemical | 0 | Nitrous Oxide | 0 | | 0 | | P | 0 | 0 |
| 05/19/82 | COLUMBUS | OH | G.F. Smith Chemical Co. | 0 | Nitrous Oxide | 0 | | 0 | | P | 0 | 0 |
| 06/11/81 | GREENSBURG | PA | Conrail Railroad | 0 | Octyl Alcohol | 0 | | 0 | | T | 68 | 0 |
| 08/04/81 | | | Amerada Hess Corp. | 0 | Oil | 0 | | 0 | | P | 5 | 0 |
| 04/03/83 | ST. LOUIS | MO | Valley Touring Service | 75000 | Oil | 0 | Monochlorobenzene | 0 | | T | 1 | 0 |
| 11/14/83 | EAST CHICAGO | IL | American Recovery | 0 | Oil | 0 | | 0 | | P | 1 | 0 |
| 02/06/81 | TERREBONNE PARISH | LA | Union Texas Petroleum | 0 | Oil | 0 | | 0 | | P | 0 | 3 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/21/83 | ELIZABETH | NJ | Port Authority Terminal | 0 | Ortho-Nitrochlorobenzene | 0 | | 0 | | T | 10 | 0 |
| 03/20/84 | AMELIA | OH | A Ichemtron / CECOS | 13000 | Oxidizers | 0 | | 0 | | P | 1 | 0 |
| 08/03/80 | VAN NUYS | CA | Oxy Med | 0 | Oxygen | 0 | | 0 | | P | 1 | 3 |
| 01/11/83 | ATLANTA | GA | Yellow Freight Systems | 413 | Paint | 0 | | 0 | | T | 1 | 0 |
| 06/18/83 | LURAY | VA | Distribution Service System | 0 | Paint | 0 | | 0 | | T | 1 | 0 |
| 01/24/84 | | CA | Unknown | 4 | Parathion | 0 | | 0 | | T | 1 | 0 |
| 06/20/84 | HAMILTON TWP. | NJ | Hess Construction | 0 | Pentachlorophenol | 0 | | 0 | | P | 24 | 0 |
| 07/22/80 | ST. BERNARD PARISH | LA | Unknown | 25000 | Pentachlorophenol | 0 | Hydrobromic Acid | 0 | | T | 2 | 0 |
| 05/04/84 | SOUTH AMBOY | NJ | Conrail Railroad | 750 | Pentane | 0 | | 0 | | T | 3 | 0 |
| 11/23/84 | CANOGA PARK | CA | Unknown | 188 | Perchloric Acid | 0 | | 0 | | P | 1 | 0 |
| 03/31/83 | KILGORE | TX | Empak Transportation | 0 | Peroxide | 0 | | 0 | | T | 1 | 0 |
| 07/14/84 | BAKERSFIELD | CA | Unknown | 75 | Pesticide | 0 | | 0 | | T | 1 | 0 |
| 06/13/85 | WILLIAMSBURG | MI | Unknown | 16000 | Pesticide | 1080 | Paraquat | 750 | Parathion | T | 24 | 0 |
| 07/16/84 | ORISKA | ND | Dakota Helicopter | 2000 | Pesticide | 0 | | 0 | | T | 1 | 0 |
| 12/04/83 | HIGHLANDS | TX | Hi-Port Industries | 0 | Petroleum Products | 0 | | 0 | | P | 4 | 0 |
| 12/06/83 | HUNTVILLE | TX | Chem Leaman Tankline Co. | 22500 | Phenol | 0 | | 0 | | T | 1 | 0 |
| 01/27/84 | FORT LAUDERDALE | FL | USCG MSO Tampa | 0 | Phenol Mercury Acetate | 0 | | 0 | | P | 1 | 0 |
| 11/12/84 | LAPORTE | TX | Upjohn Co. | 5000 | Phosgene | 3000 | Monochlorobenzene | 0 | | P | 2 | 0 |
| 06/03/81 | GEISMAR | LA | BASF Wyandotte Corp. | 0 | Phosgene | 0 | | 0 | | P | 15 | 0 |
| 03/03/80 | LOCKPORT | NY | Twin Lake Chemical | 1800 | Phosgene | 0 | | 0 | | P | 7 | 1 |
| 06/02/82 | WESTLAKE | LA | Olin Chemical | 0 | Phosgene | 0 | | 0 | | P | 60 | 1 |
| 12/26/84 | KANSAS CITY | MO | General Mill | 0 | Phosphine | 0 | | 0 | | P | 3 | 0 |
| 09/20/84 | BARSTOW | CA | Unknown | 1875 | Phosphoric Acid | 0 | | 0 | | T | 1 | 0 |
| 05/16/85 | SEATTLE | WA | Rainier Brewery | 0 | Phosphoric Acid | 0 | Chlorine Bleach | 0 | | P | 5 | 0 |
| 01/05/84 | GADSDEN | AL | Schwerman Trucking Co. | 50 | Phosphoric Acid | 0 | | 0 | | T | 12 | 0 |
| 04/03/80 | SOMERVILLE | MA | Unknown | 97500 | Phosphoric Trichloride | 0 | Hydrochloric Acid | 0 | Phosphoric Acid | T | 343 | 0 |
| 04/14/83 | CASA GRANDE | AZ | Southern Pacific Trans. Co. | 0 | Phosphorus | 0 | | 0 | | T | 4 | 1 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/22/84 | SAUGET | IL | Monsanto | 45000 | Phosphorus Oxychloride | 0 | | 0 | | P | 125 | 0 |
| 10/17/83 | CHARLESTON | SC | Chemical Leaman Tanklines | 13000 | Phosphorus Oxychloride | 0 | | 0 | | P | 1 | 0 |
| 06/07/84 | ST. LOUIS | MO | US Polymer Corp. | 0 | Phthalic Anhydride | 0 | | 0 | | P | 2 | 0 |
| 12/13/84 | CARPENTERSVILLE | IL | Cargill Inc. | 0 | Phthalic Anhydride | 0 | | 0 | | P | 7 | 0 |
| 03/26/84 | PITTSBURGH | PA | US Steel Corp. | 100000 | Phthalic Anhydride | 0 | | 0 | | P | 1 | 0 |
| 10/06/82 | COLUMBUS | OH | C and SOE Co. | 60 | Polychlorinated Biphenyls | 0 | | 0 | | P | 0 | 0 |
| 01/29/84 | JACKSONVILLE | FL | American Electric Co. | 15000 | Polychlorinated Biphenyls | 0 | Oil | 0 | | P | 2 | 0 |
| 08/13/84 | PORTLAND | OR | Unknown | 98 | Polychlorinated Biphenyls | 0 | | 0 | | T | 1 | 0 |
| 11/01/83 | MILWAUKEE | WI | WI Electric Power Co. | 8 | Polychlorinated Biphenyls | 0 | | 0 | | P | 1 | 0 |
| 09/17/84 | LIVONIA | MI | Ford Motor Co. | 0 | Polychlorinated Biphenyls | 0 | | 0 | | P | 6 | 0 |
| 02/29/84 | CHARLOTTE | NC | Winn Dixie | 38 | Polychlorinated Biphenyls | 0 | | 0 | | P | 8 | 0 |
| 03/21/84 | WELLSTON | OH | Genos | 1500 | Polychlorinated Biphenyls | 0 | | 0 | | P | 2 | 0 |
| 03/20/84 | SPRING CITY | TN | Westinghouse | 0 | Polychlorinated Biphenyls | 0 | | 0 | | P | 2 | 0 |
| 03/01/83 | NEWPORT | DE | Dupont Union | 0 | Polychlorinated Biphenyls | 0 | | 0 | | P | 5 | 0 |
| 05/01/83 | FLAGSTAFF | AZ | Unknown | 20 | Polychlorinated Biphenyls | 0 | | 0 | | T | 2 | 0 |
| 06/15/83 | MIAMI | FL | Florida Screen Ent. Inc. | 20 | Polychlorinated Biphenyls | 0 | | 0 | | P | 1 | 0 |
| 07/02/83 | CHICAGO | IL | Commonwealth Edison | 135 | Polychlorinated Biphenyls | 0 | | 0 | | P | 1 | 0 |
| 09/26/83 | HACKLEBURG | AL | Unknown | 0 | Polychlorinated Biphenyls | 0 | | 0 | | T | 1 | 0 |
| 08/23/83 | NEWARK | NJ | P. D. Plastics | 0 | Polyethylene | 0 | Polypropylene | 0 | Acrylonitrile | P | 0 | 0 |
| 10/17/83 | BEDFORD | PA | Matlack Inc. | 0 | Polymeric Diphenol | 0 | Methane Diisocyanate | 0 | | T | 1 | 0 |
| 10/12/84 | RIDGEWOOD | KY | Unknown | 0 | Polystyrene | 0 | | 0 | | T | 1 | 0 |
| 03/21/85 | PLAINFIELD | NJ | Oliver Brown Trucking | 0 | Polyvinyl Chloride | 0 | | 0 | | P | 90 | 1 |
| 03/05/84 | JERSEY CITY | NJ | Fabric Chemical Corp. | 0 | Potassium Hydroxide | 0 | Sodium Hypochlorite | 0 | Acetic Acid | P | 0 | 0 |
| 07/09/84 | RANKING | TX | Unknown | 0 | Propane | 0 | | 0 | | T | 3 | 0 |
| 10/03/78 | DENVER | CO | Unknown | 0 | Propane | 0 | | 0 | | P | 1 | 3 |
| 03/20/79 | LINDEN | NJ | Exxon Co. | 0 | Propane | 0 | Butane | 0 | Hydrocarbons | P | 6 | 0 |
| 04/20/84 | WANATAH | IN | Grand Truck Western Railroad | 0 | Propane | 0 | | 0 | | T | 8 | 0 |
| 05/26/81 | ARTESIA | NM | Navajo Refinery Co. | 0 | Propane | 0 | Butane | 0 | | P | 17 | 0 |
| 08/20/83 | MOBILE | AL | Southern Railroad | 0 | Propyl Mercaptan | 0 | | 0 | | T | 3 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10/21/80 | NEW CASTLE | DE | Unknown | 14000 | Propylene | 0 | Polypropylene | 0 | | P | 12 | 6 |
| 11/05/81 | CASTAIC | CA | Unknown | 15000 | Propylene Dichloride | 0 | | 0 | | T | 100 | 0 |
| 08/03/83 | NEWARK | OH | Owen Corning Fiberglass | 7500 | Propylene Oxide | 0 | | 0 | | P | 11 | 0 |
| 02/02/85 | LONG BRANCH | NJ | Unknown | 0 | Pyrethrin | 0 | | 0 | | P | 0 | 0 |
| 11/08/83 | MONTPELIER | OH | Rogers Cartage Co. | 0 | Resin | 0 | | 0 | | T | 1 | 0 |
| 08/31/83 | MONTICELLO | IN | Matlack Inc. | 75 | Silicate of Soda | 0 | | 0 | | P | 1 | 0 |
| 08/22/81 | SAN FRANCISCO | CA | M & T Chemicals | 10000 | Silicon Tetrachloride | 0 | | 0 | | P | 28 | 0 |
| 09/19/83 | ALAMOGORDO | NM | Drexel Chemical Co. | 12000 | Sodium Chlorite | 6000 | Urea | 0 | | T | 0 | 2 |
| 06/07/83 | GROVEVILLE | NJ | Unknown | 0 | Sodium Hydrosulfate | 0 | Sodium Hydroxide | 0 | | P | 1 | 0 |
| 09/13/82 | CHARLOTTE | NC | Unknown | 0 | Sodium Hydrosulfide | 0 | Paraquat | 0 | | P | 29 | 0 |
| 08/10/83 | ATLANTA | GA | Unknown | 0 | Sodium Hydrosulfite | 0 | | 0 | | T | 16 | 0 |
| 07/20/84 | TEXARKANA | TX | International Paper | 100 | Sodium Hydroxide | 0 | | 0 | | P | 1 | 1 |
| 07/10/84 | TILTON | IL | Norfolk & Western Railway | 0 | Sodium Hydroxide | 0 | | 0 | | T | 1 | 0 |
| 01/20/84 | MANSFIELD | LA | International Paper | 300 | Sodium Hydroxide | 0 | | 0 | | P | 1 | 0 |
| 03/19/84 | E. CHICAGO | IN | J & L Steel Co. | 38 | Sodium Hydroxide | 0 | | 0 | | P | 2 | 0 |
| 04/21/83 | ELKHART | IN | Matlack Inc. | 188 | Sodium Hydroxide | 0 | | 0 | | T | 1 | 0 |
| 04/27/83 | PARKERSBURG | WV | Chessie Systems Railroad | 15 | Sodium Hydroxide | 0 | | 0 | | T | 1 | 0 |
| 07/06/83 | CHICAGO | IL | Morgan Services | 75 | Sodium Hydroxide | 0 | | 0 | | P | 1 | 0 |
| 08/18/83 | ST. MARYS | GA | Fleet Transport Co. | 0 | Sodium Hydroxide | 0 | | 0 | | T | 1 | 0 |
| 10/17/84 | WATERBURY | CT | Hampton Color and Chemical Co | 2250 | Sodium Hypochlorite | 0 | | 0 | | P | 1 | 0 |
| 08/28/83 | DONEGAL | PA | Unknown | 41000 | Sodium Nitrate | 0 | | 0 | | T | 10 | 4 |
| 08/18/83 | DOVER | DE | CFE Air Cargo | 100 | Sodium Nitrate | 0 | | 0 | | P | 1 | 0 |
| 04/30/85 | GOOSE CREEK | SC | Mobay Chemical Corp. | 0 | Sodium Sulfhydrate | 0 | | 0 | | P | 5 | 1 |
| 05/25/84 | DAYTON | OH | CPS Delivery | 38 | Solvent | 0 | | 0 | | T | 1 | 0 |
| 12/20/84 | AKRON | OH | Recycle Energy | 0 | Solvent | 0 | | 0 | | P | 7 | 3 |
| 04/03/84 | BAILEYS CROSSROADS | VA | Trans Circuits | 0 | Solvent | 0 | Acid | 0 | | P | 18 | 0 |
| 06/21/84 | KANSAS CITY | KS | Old Theatre Architectural Salvage Co. | 0 | Solvent | 0 | | 0 | | P | 7 | 0 |
| 06/01/84 | YREKA | CA | Trans AM Div of Schnieder Nat'l. | 375 | Solvent | 0 | | 0 | | T | 1 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02/07/83 | GRAPEVILLE | CA | Unknown | 26250 | Solvents/Corrosives | 0 | | 0 | | T | 0 | 0 |
| 08/22/84 | FREEDOM | PA | Ashland Petroleum Co. | 0 | Specialty Oils | 0 | | 0 | | P | 1 | 2 |
| 04/29/82 | CANFIELD | OH | Polysar Inc. | 4500 | Styrene | 0 | | 0 | | T | 3 | 0 |
| 11/30/82 | ORANGE | CA | Casden Oil and Chemical | 45000 | Styrene | 0 | | 0 | | P | 0 | 0 |
| 04/13/80 | MCNEILL | MS | Unknown | 0 | Styrene | 0 | Crude Oil | 0 | Diesel Fuel | T | 2 | 0 |
| 04/24/80 | BAYONNE | NJ | ICI Americas | 0 | Styrene | 0 | Toluene Diisocyanate | 0 | | P | 5 | 0 |
| 11/16/84 | PORTER | DE | Conrail | 1 | Styrene | 0 | | 0 | | T | 1 | 0 |
| 08/25/83 | MONACA | PA | Arco | 0 | Styrene | 0 | | 0 | | P | 1 | 0 |
| 01/19/85 | | CA | Unknown | 60000 | Sulfur | 0 | | 0 | | T | 7 | 2 |
| 10/30/81 | BERKLEY | MO | McKesson Chemical Co. | 150 | Sulfur Dioxide | 0 | | 0 | | P | 0 | 0 |
| 01/21/81 | ELIZABETH | NJ | Allied Chemical Corp. | 0 | Sulfur Trioxide | 0 | | 0 | | P | 70 | 0 |
| 09/08/84 | BAKERSFIELD | CA | Unknown | 563 | Sulfuric Acid | 0 | | 0 | | T | 1 | 0 |
| 10/02/82 | KANSAS CITY | KS | Union Pacific Railroad | 0 | Sulfuric Acid | 0 | | 0 | | T | 2 | 0 |
| 09/22/83 | SALISBURY | NC | National Starch and Chemical | 0 | Sulfuric Acid | 0 | | 0 | | P | 22 | 0 |
| 03/30/84 | EAST SYRACUSE | NY | United Parcel Service | 10 | Sulfuric Acid | 0 | | 0 | | T | 40 | 0 |
| 05/15/80 | DEPUE | IL | Mobil Chemical Oil | 7500 | Sulfuric Acid | 0 | Hydrogen Sulfide | 0 | | P | 1 | 1 |
| 05/14/84 | SANTA BARBARA | CA | Reaghem's Vacuum Truck Service | 0 | Sulfuric Acid | 0 | Ammonia Sulfate | 0 | Copper Sulfate | T | 3 | 0 |
| 12/13/84 | ELKRIDGE | MD | Chesapeake Finished Metals Co. | 0 | Sulfuric Acid | 0 | | 0 | | P | 0 | 2 |
| 11/03/83 | MIDLAND | MI | Dow Chem. Co | 7665 | Sulfuric Acid | 0 | | 0 | | P | 1 | 0 |
| 11/10/83 | CASPER | WY | Burlington Northern Railroad | 450 | Sulfuric Acid | 0 | | 0 | | T | 1 | 0 |
| 09/26/84 | MEMPHIS | TN | Thompson Hayward Chemical | 150 | Sulfuric Acid | 0 | | 0 | | P | 1 | 0 |
| 10/11/84 | PORTAGEVILLE | TN | Thompson Hayward Chemical | 2 | Sulfuric Acid | 0 | | 0 | | P | 1 | 0 |
| 11/05/84 | BARTON | FL | W.R. Grace and Co. | 1 | Sulfuric Acid | 0 | | 0 | | P | 1 | 0 |
| 12/05/84 | HOLLBROOK | AZ | Wayne Daniels Truck, Inc. | 0 | Sulfuric Acid | 0 | Hydrochloric Acid | 0 | | T | 3 | 0 |
| 12/26/84 | PALMDALE | FL | Ctl. Distribution | 0 | Sulfuric Acid | 0 | | 0 | | T | 1 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/11/84 | TERRE HAUTE | IN | Indiana St. University | 1875 | Sulfuric Acid | 0 | | 0 | | P | 2 | 0 |
| 01/26/83 | INDIANAPOLIS | IN | Ulrich Chemical Co. | 37500 | Sulfuric Acid | 0 | | 0 | | P | 10 | 0 |
| 04/30/83 | NEW HAVEN | CT | Consolidated Railroad | 38 | Sulfuric Acid | 0 | | 0 | | T | 1 | 0 |
| 07/27/83 | COLUMBUS | OH | Unknown | 750 | Sulfuric Acid | 0 | | 0 | | T | 1 | 0 |
| 07/27/83 | TOLEDO | OH | Conrail | 15 | Sulfuric Acid | 0 | | 0 | | T | 1 | 0 |
| 08/12/83 | GEORGIA PACIFIC | LA | Georgia Pacific | 0 | Sulfuric Acid | 0 | | 0 | | P | 1 | 0 |
| 10/07/83 | CINCINNATI | OH | Chessie Systems Railroad | 8 | Sulfuric Acid | 0 | | 0 | | T | 1 | 0 |
| 09/24/84 | BELMONT | CA | Unknown | 413 | Tetrachloroethylene | 0 | | 0 | | T | 2 | 0 |
| 01/30/85 | LOS ANGELES | CA | Unknown | 1875 | Tetrachloroethylene | 0 | | 0 | | P | 8 | 0 |
| 09/28/82 | LIVINGSTON | LA | Unknown | 0 | Tetraethyl Lead | 0 | Vinyl Chloride | 0 | | T | 5 | 0 |
| 06/26/84 | VICTORVILLE | CA | Unknown | 37125 | Tetrahydrofuran | 0 | | 0 | | T | 3 | 0 |
| 12/22/83 | ELIZABETH | NJ | Unknown | 413 | Thionyl Chloride | 0 | | 0 | | P | 1 | 0 |
| 03/05/85 | Kelton | OH | IML Freight Lines | 225 | Thiophene | 0 | | 0 | | T | 1 | 0 |
| 05/15/84 | PALO VERDE | CA | Unknown | 0 | Thisodian | 0 | | 0 | | T | 1 | 0 |
| 02/12/85 | MIDDLESEX | NJ | Chem-Ray Coating Corp. | 0 | Toluene | 0 | Methyl Ethyl Ketone | 0 | N-Butyl Alcohol | P | 8 | 1 |
| 11/15/84 | PHOENIX | AZ | Western States Petroleum | 0 | Toluene | 0 | | 0 | | P | 9 | 1 |
| 04/18/85 | AFTON | VA | Greenwood Chemical Co. | 0 | Toluene | 0 | | 0 | | P | 1 | 3 |
| 11/09/83 | CARROLLTON | KY | M & T Chemical Co. | 188 | Toluene | 0 | | 0 | | P | 2 | 0 |
| 02/26/84 | DOLTON | IL | McKesson & Envirosystems Co. | 0 | Toluene | 0 | | 0 | | P | 1 | 0 |
| 03/16/85 | SAN DIEGO | CA | Fluid Systems, U.O.P. Inc. | 0 | Toluene Diisocyanate | 0 | | 0 | | P | 25 | 0 |
| 01/12/83 | WATERTOWN | NY | Chemical Leaman Tank Lines | 750 | Toluene Diisocyanate | 0 | | 0 | | T | 3 | 0 |
| 01/31/83 | MIAMI | FL | Dixie Bedding Co. | 38 | Toluene Diisocyanate | 0 | | 0 | | P | 2 | 0 |
| 09/27/83 | LINDEN | NJ | Teag Electric Inc. | 300 | Trichloroethane | 0 | | 0 | | P | 12 | 0 |
| 04/11/84 | NEWARK | NJ | Sherwin Williams Paint | 0 | Trichloroethane | 0 | | 0 | | P | 5 | 1 |
| 10/22/82 | QUEENS | NY | Allomatic Industries | 413 | Trichloroethylene | 0 | | 0 | | P | 40 | 0 |
| 03/30/84 | FRANKFORT | IN | Kaiser Agricultural Chemical | 300 | Trifluralin | 0 | | 0 | | P | 1 | 0 |
| 12/22/84 | SAGINAW | MI | Chessie Systems Railroad | 0 | Trimethylamine | 0 | | 0 | | T | 3 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 02/17/84 | DAYTON | OH | County of Montgomery | 0 | Unknown | 0 | | 0 | | P | 4 | 0 |
| 05/15/84 | NEWCASTLE | DE | Airport Toyota Inc | 0 | Unknown | 0 | | 0 | | P | 1 | 0 |
| 05/31/84 | MANNHATAN | NY | Con Edison | 0 | Unknown | 0 | | 0 | | P | 11 | 0 |
| 12/03/84 | CONCORD/MANCHESTER | NH | Unknown | 0 | Unknown | 0 | | 0 | | P | 1 | 0 |
| 05/25/83 | LEWIS | MA | Louis Chemical Corp. | 0 | Unknown | 0 | | 0 | | P | 12 | 0 |
| 06/15/83 | UTICA | MI | Liquid Disposal Inc. | 0 | Unknown | 0 | | 0 | | P | 6 | 0 |
| 07/11/81 | SANTA FE SPRINGS | CA | Unknown | 0 | Unknown | 0 | | 0 | | P | 8 | 0 |
| 04/14/85 | SUN VALLEY | CA | Research Organic Inorganic Chem. Corp. | 0 | Unknown | 0 | | 0 | | P | 10 | 0 |
| 11/26/80 | INDIAN TRAIL | NC | Radiator Specialty Co. | 0 | Unknown | 0 | | 0 | | P | 52 | 0 |
| 04/27/80 | WHITE SPRINGS | FL | Occidental Chemical | 0 | Unknown | 0 | | 0 | | P | 11 | 0 |
| 05/12/80 | BROOKLYN | NY | Lowenstein Dyes and Cosmetics | 0 | Unknown | 0 | | 0 | | P | 1 | 0 |
| 02/06/81 | BERENSVILLE | IL | Lawter Chemicals | 0 | Unknown | 0 | | 0 | | P | 6 | 0 |
| 11/05/81 | GARY | IN | Anderson Development Co. | 0 | Unknown | 0 | | 0 | | P | 6 | 0 |
| 07/10/81 | KALAMAZOO | MI | American Cyanamid and Chemical Co. | 0 | Unknown | 0 | | 0 | | P | 1 | 1 |
| 12/09/81 | PORT ARTHUR | TX | Gulf Oil | 0 | Unknown | 0 | | 0 | | P | 23 | 0 |
| 01/14/82 | POUGHKEEPSIE | NY | Berncolors Poughkeepsie Inc. | 0 | Unknown | 0 | | 0 | | P | 11 | 2 |
| 03/26/84 | SAN JOSE | CA | Santa Clara Cny | 0 | Unknown | 0 | | 0 | | T | 4 | 0 |
| 10/08/84 | HODGKINS | IL | Unknown | 0 | Unknown | 0 | | 0 | | T | 6 | 0 |
| 07/13/84 | IMPERIAL | CA | Unknown | 100 | Unknown | 0 | | 0 | | T | 1 | 0 |
| 10/19/83 | KEYSVILLE | VA | General Battery Corp. | 0 | Unknown | 0 | | 0 | | T | 1 | 0 |
| 04/02/83 | PHILADELPHIA | PA | Rohm and Haas | 0 | Unknown | 0 | | 0 | | P | 1 | 0 |
| 07/08/83 | FT. WAYNE | IN | Yellow Freight | 1238 | Unknown | 0 | | 0 | | T | 1 | 0 |
| 12/12/83 | PIKETON | OH | Goodyear Atomic | 0 | Uranium Hexafluoride | 0 | | 0 | | P | 7 | 0 |
| 08/31/84 | RIDGEFIELD | NJ | Unknown | 0 | Urethane Resin | 0 | | 0 | | T | 6 | 0 |
| 09/01/79 | DEER PARK | TX | Unknown | 15750000 | Vacuum Distillate | 7875000 | Ethyl Alcohol | 0 | | P | 9 | 1 |
| 06/17/83 | MEDLEY | FL | Highway Transport Inc. | 8 | Vinyl Acetate | 0 | | 0 | | P | 1 | 0 |

SUMMARY OF EVENTS WITH DEATHS OR INJURIES

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/30/83 | BATON ROUGE | LA | Formosa Plastics Co. | 0 | Vinyl Chloride | 0 | | 0 | | P | 2 | 0 |
| 09/19/80 | FITCHBURG | MA | Great American Chemical Co. | 0 | Vinyl Chloride | 0 | | 0 | | P | 8 | 0 |
| 02/02/84 | TOLEDO | OH | CE Casting Co. | 10 | Vinyl Chloride | 0 | | 0 | | P | 1 | 0 |
| 06/07/84 | CARSON | CA | Joslyn Manufacturing & Supply | 0 | Zinc | 0 | | 0 | | P | 9 | 1 |
| 01/27/84 | ROCHESTER | NY | New Dominion Machine Co. Ltd. | 10 | Zinc Cyanide | 0 | | 0 | | P | 4 | 0 |
| 08/22/81 | DESTREHAM | LA | St. Rose Fleeting | 0 | Zinc Dust | 0 | | 0 | | T | 2 | 0 |
| *** Total *** | | | | | | | | | | | 4717 | 138 |

# APPENDIX H

## LIST OF EVENTS IN WHICH DEATHS OCCURRED

SUMMARY OF EVENTS WITH REPORTED DEATHS

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 08/15/84 | SIMSBURY | CT | Ensign - Brickford Industries | 0 | Acetone/Nitric Acid | 0 | | 0 | | P | 0 | 3 |
| 02/28/80 | DE SOTO | KS | Sunflower Army Ammunition Plant | 0 | Alcohol | 0 | | 0 | | P | 1 | 1 |
| 07/27/84 | HOUSTON | TX | Unknown | 23000 | Aluminum Phosphide | 0 | | 0 | | T | 8 | 1 |
| 05/29/85 | SAN ANTONIO | TX | Lone Star Ice House | 0 | Ammonia | 0 | | 0 | | P | 10 | 3 |
| 06/16/84 | | OH | Duane Martin Farm | 3750 | Anhydrous Ammonia | 0 | | 0 | | T | 0 | 1 |
| 11/26/80 | MENDOTA | CA | Unknown | 38 | Carbolic Acid | 0 | Gasoline | 0 | | T | 0 | 1 |
| 03/01/83 | CHARLESTON | WV | FMA Corp. | 225 | Chlorine | 0 | | 0 | | P | 3 | 1 |
| 10/31/82 | NIAGARA FALLS | NY | E.I. DuPont de Nemours and Co. | 2000 | Chlorine | 0 | | 0 | | P | 76 | 1 |
| 08/16/84 | CLEVELAND | OH | Mobile Tank Car Services | 0 | Coal Tar | 0 | Light Oil | 0 | | T | 21 | 2 |
| 07/08/77 | FAIRBANKS | AK | Unknown | 0 | Crude Oil | 0 | | 0 | | T | 6 | 1 |
| 06/17/85 | HOPEWELL | NJ | American Surfacing Co. Inc. | 0 | Ethyl Acetate | 0 | Polyurethane Binder | 0 | | P | 0 | 1 |
| 06/09/81 | FT. MADISON | IA | Chevron Chemical Co. | 7500 | Ethylamine | 0 | | 0 | | P | 1 | 1 |
| 10/13/81 | FREEPORT | TX | Dow Chemical Co. | 0 | Ethylene | 0 | Polyethylene | 0 | | P | 7 | 6 |
| 07/30/81 | GRANTSVILLE | VT | Mining Services International | 0 | Explosives | 0 | | 0 | | P | 0 | 5 |
| 05/27/83 | BENTON | TN | Webb Bait Farm | 0 | Explosives | 0 | | 0 | | P | 1 | 11 |
| 11/26/83 | BALLPORT | NY | New York Pyrotechnic Inc. | 0 | Explosives | 0 | | 0 | | P | 23 | 2 |
| 11/25/80 | KENNER | LA | Mobil Oil Co. | 0 | Flammable Liquid | 0 | | 0 | | T | 2 | 7 |
| 09/05/84 | ANTHONY | KS | Farmers Oil Co. | 0 | Fuel | 0 | | 0 | | P | 3 | 2 |
| 09/01/83 | CHALMETTE | LA | Tenneco Oil Refinery | 900000 | Gasoline | 0 | | 0 | | P | 24 | 1 |
| 12/03/79 | TORRANCE | CA | Mobil Oil | 0 | Gasoline | 0 | Butane | 0 | | P | 0 | 3 |
| 06/23/84 | HIALEAH | FL | Unknown | 60000 | Gasoline | 0 | | 0 | | T | 0 | 1 |
| 08/23/80 | MADISONVILLE | LA | Stokes Oil Co. | 0 | Gasoline | 0 | | 0 | | P | 1 | 1 |
| 11/14/81 | CANON CITY | CO | Unknown | 0 | Gasoline | 0 | | 0 | | T | 6 | 7 |
| 07/28/83 | SANBORN | IA | Dahleen Transportation | 0 | Hexane | 0 | | 0 | | T | 2 | 1 |
| 05/10/84 | PEABODY | MA | Henry Leather Co. | 0 | Hydrocarbons | 0 | Benzene | 0 | Lacquer | P | 125 | 1 |
| 01/13/82 | UTICA | MI | Liquid Disposal Corp. | 0 | Hydrogen Sulfide | 0 | | 0 | | P | 15 | 2 |
| 07/27/84 | BETHLEHEM | PA | Joseph Ayers Co. | 0 | Isopropyl Alcohol | 0 | Hydrocarbons | 0 | | P | 3 | 1 |

SUMMARY OF EVENTS WITH REPORTED DEATHS

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/24/80 | QUEENS | NY | Unknown | 0 | Lacquer | 0 | | 0 | | P | 40 | 4 |
| 05/30/78 | TEXAS CITY | TX | Unknown | 0 | Light Hydrocarbons | 0 | Hydrocarbons | 0 | | P | 10 | 5 |
| 12/20/83 | EAST CAMDEN | AR | Tracor-MBA | 0 | Magnesium | 0 | | 0 | | P | 21 | 1 |
| 06/07/84 | ST. LOUIS | MO | Slay Transport | 0 | Maleic Anhydride | 0 | | 0 | | P | 1 | 1 |
| 07/21/83 | BEACON FALLS | PA | Chippewa Township Sewage Treatment | 0 | Methane | 0 | Chlorine | 0 | | P | 9 | 2 |
| 02/02/82 | LIMA | OH | Vistron | 0 | Methyl Acrylate | 0 | Acrylonitrile | 0 | | P | 1 | 1 |
| 10/03/83 | HOUSTON | TX | J. Chemical Co. | 30000 | Methyl Bromide | 0 | Malathion | 0 | | P | 5 | 2 |
| 11/19/82 | HAMILTON CO. | OH | Ohio Valley Graphic Ink Co. | 0 | Methyl Ethyl Ketone | 0 | | 0 | | P | 0 | 1 |
| 09/03/81 | MARRERO | LA | Celotex Corp. | 0 | Naphtha Asphalt | 0 | | 0 | | P | 13 | 1 |
| 06/02/82 | GULFPORT | MS | Plastifax Corp. | 0 | Nitric Acid | 0 | | 0 | | P | 61 | 3 |
| 02/21/85 | SAYREVILLE | NJ | Hercules Powder Plant | 0 | Nitrocellulose | 0 | | 0 | | P | 5 | 1 |
| 02/06/81 | TERREBONNE PARISH | LA | Union Texas Petroleum | 0 | Oil | 0 | | 0 | | P | 0 | 3 |
| 08/03/80 | VAN NUYS | CA | Oxy Med | 0 | Oxygen | 0 | | 0 | | P | 1 | 3 |
| 03/03/80 | LOCKPORT | NY | Twin Lake Chemical | 1800 | Phosgene | 0 | | 0 | | P | 7 | 1 |
| 06/02/82 | WESTLAKE | LA | Olin Chemical | 0 | Phosgene | 0 | | 0 | | P | 60 | 1 |
| 04/14/83 | CASA GRANDE | AZ | Southern Pacific Trans. Co. | 0 | Phosphorus | 0 | | 0 | | T | 4 | 1 |
| 03/21/85 | PLAINFIELD | NJ | Oliver Brown Trucking | 0 | Polyvinyl Chloride | 0 | | 0 | | P | 90 | 1 |
| 10/03/78 | DENVER | CO | Unknown | 0 | Propane | 0 | | 0 | | P | 1 | 3 |
| 10/21/80 | NEW CASTLE | DE | Unknown | 14000 | Propylene | 0 | Polypropylene | 0 | | P | 12 | 6 |
| 09/19/83 | ALAMOGORDO | NM | Drexel Chemical Co. | 12000 | Sodium Chlorite | 6000 | Urea | 0 | | T | 0 | 2 |
| 07/20/84 | TEXARKANA | TX | International Paper | 100 | Sodium Hydroxide | 0 | | 0 | | P | 1 | 1 |
| 08/28/83 | DONEGAL | PA | Unknown | 41000 | Sodium Nitrate | 0 | | 0 | | T | 10 | 4 |
| 04/30/85 | GOOSE CREEK | SC | Mobay Chemical Corp. | 0 | Sodium Sulfhydrate | 0 | | 0 | | P | 5 | 1 |
| 12/20/84 | AKRON | OH | Recycle Energy | 0 | Solvent | 0 | | 0 | | P | 7 | 3 |
| 08/22/84 | FREEDOM | PA | Ashland Petroleum Co. | 0 | Specialty Oils | 0 | | 0 | | P | 1 | 2 |
| 01/19/85 | | CA | Unknown | 60000 | Sulfur | 0 | | 0 | | T | 7 | 2 |
| 05/15/80 | DEPUE | IL | Mobil Chemical Oil | 7500 | Sulfuric Acid | 0 | Hydrogen Sulfide | 0 | | P | 1 | 1 |

SUMMARY OF EVENTS WITH REPORTED DEATHS

| DATE | CITY | ST | COMPANY | QTY1 Lbs. | SUBSTANCE1 | QTY2 Lbs. | SUBSTANCE2 | QTY3 Lbs. | SUBSTANCE3 | PLANT OR TRANS | INJURIES | DEATHS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/13/84 | ELKRIDGE | MD | Chesapeake Finished Metals Co. | 0 | Sulfuric Acid | 0 | | 0 | | P | 0 | 2 |
| 02/12/85 | MIDDLESEX | NJ | Chem-Ray Coating Corp. | 0 | Toluene | 0 | Methyl Ethyl Ketone | 0 | N-Butyl Alcohol | P | 8 | 1 |
| 11/15/84 | PHOENIX | AZ | Western States Petroleum | 0 | Toluene | 0 | | 0 | | P | 9 | 1 |
| 04/18/85 | AFTON | VA | Greenwood Chemical Co. | 0 | Toluene | 0 | | 0 | | P | 1 | 3 |
| 04/11/84 | NEWARK | NJ | Sherwin Williams Paint | 0 | Trichloroethane | 0 | | 0 | | P | 5 | 1 |
| 07/10/81 | KALAMAZOO | MI | American Cyanamid and Chemical Co. | 0 | Unknown | 0 | | 0 | | P | 1 | 1 |
| 01/14/82 | POUGHKEEPSIE | NY | Berncolors Poughkeepsie Inc. | 0 | Unknown | 0 | | 0 | | P | 11 | 2 |
| 09/01/79 | DEER PARK | TX | Unknown | 15750000 | Vacuum Distillate | 7875000 | Ethyl Alcohol | 0 | | P | 9 | 1 |
| 06/07/84 | CARSON | CA | Joslyn Manufacturing & Supply | 0 | Zinc | 0 | | 0 | | P | 9 | 1 |
| *** Total *** | | | | | | | | | | | 764 | 138 |