APPENDIX B

Mary Kay O'Connor Process Safety Center

Chemical Safety Program Assessment Project

National Chemical Incident Repository

Development Plan

Draft Working Document

7 August, 2000

Printed

8/21/00 4:01 PM

Table of Contents

Introduction

Flow of Information
- Current
- Proposed

Database Manager's Functions
- Tracking Incidents through System
- Filtering Incidents
- Vetting Incident Data
  - "to subject to expert appraisal or correction"
- Merging Incident Data from Various Sources
- Translating Data from other Sources
- Comparing News Reports to Government Reporting
- Providing Access to the Public

Recommended Scope of Incidents
- Facilities and Transportation Modes
- Chemicals
- Thresholds

Recommended Scope of Data
- Location
- Owners and Operators
- Type of Facility or Mode of Transportation
- Type of Process, Activity, Service and Products
- Consequences
  - Human
  - Environmental
  - Monetary
- Chemicals Involved
- Equipment Involved
- Causes
- Investigative reports
- Weather Conditions
- Remedial Action
- Emergency Response
- Agency Administrative Details
- Enforcement Actions?

Scope of Current Data Sources

Databases

NRC / EPA – IRIS / ERNS
EPA - ARIP
EPA - RMP
OSHA - AIS
USFA - NFIRS
DOT / OHM - HMIS
DOT RSPA / OPS
ATSDR - HSEES
MKOPSC – NBIRS
Private Sources – Industry Groups, Insurance Companies, Consultants, Individual Companies

Investigative reports

CSB
NTSB

Overlaps and Gaps

Recommended Short Term Improvements in Data Accessibility

On-line?
Search Capabilities
Output Options
Downloading of Database

Recommended Modifications in Existing Data Collection and Reporting

Scope of Incidents
Scope of Information
Terminology, Taxonomy

Barriers to Implementing Repository

Legislative
Rulemaking
Cooperation
Funding

Appendix

A. Spreadsheet Summary of Data Sources

B. Roundtable Repository Development Committee Members
C. Glossary
D. Acronyms
E. Bibliography

Introduction

A national repository of information on chemical accidents has been identified as the top priority of Chemical Safety Program Assessment Roundtable. The Roundtable consists of stakeholders from industry, government, academia, public interest groups and others.

The repository is to serve two basic functions:

1. Track progress in reducing chemical incidents.

   Especially, to determine if existing programs of government, industry and other organizations are effective in reducing the number and consequences of chemical incidents.

2. Learning from past incidents to help reduce incidents in the future.

   Especially, to identify **patterns** of system failure to guide and prioritize efforts in the areas of investigation, legislation, regulation, management, operation, training, and research.

Currently there are many federal, state and local agencies collecting and reporting chemical incidents. However, each agency can only collect information on incidents within their legislative authority. Rulemaking further limits the scope in many cases. Also, because of the varying focus amongst agencies the data collected and the terminology employed vary widely. The agencies are generally limited to certain chemicals, above threshold quantities, in particular facilities or transportation modes. These limitations stymie efforts to gain an overview of all chemical incidents.

Many of the systems rely on self-reporting of incidents by companies involved. While the reporting is mandated by law it is not known how many incidents go unreported. Independent means of checking for completeness are generally not available. Some agencies do use proactive means of searching for incidents, however, their scope is limited in other ways. The NRC/ERNS systems focus on early notification of incidents but lack accurate and detailed follow-up information.

Because of the patchwork of collecting and reporting there are undoubtedly overlaps and gaps. The development of an integrated system must address this problem. Additionally, it is desirable to eliminate redundant reporting to multiple agencies.

Integration of Existing Sources versus A New “Perfect System”

While it is easy to be critical of the existing systems it should be recognized that substantial resources are involved in data collection, vetting, investigation and reporting. These incident investigation and reporting efforts are often integral to the agency's function. OSHA for instance has a database that summarizes all the accidents that they investigate. Thousands of these involve chemicals. This content cannot be captured by a new reporting system, it has to be integrated into the system.

Because of the close coupling of the data gathering and investigation to the agency's function it appears impractical to replace the existing systems with one new system. In addition there are generally 5 to 25 years of previous data in these systems. Integrating the systems should allow for effective use of these existing resources.

Technical advancement is also making it easier to integrate data from diverse resources. Most database systems are or will be updated to systems that can convert data to commonly available standard formats. This data can then be readily transferred by electronic means to the integrated system.

This proposed plan seeks to capitalize on the existing data and systems while bringing them together in an integrated system, making them more complete, consistent, and accessible.

The plan also addresses the flow, tracking, filtering, and vetting of information from initial reporting, through the relevant agencies and into the repository.

Accessibility of incident reporting systems has improved dramatically in the last few years as information is made available on the internet. However, there is still a great deal of progress that can be made simply by making information available online. This report makes recommendations in this regard that can be implemented in the short term while the integrated system is being developed.

The proposed repository will also include collection of news accounts of incidents. This will serve several purposes. It will provide a check to see if all significant incidents are being reported to the NRC. It can also provide additional information that is not otherwise being collected, especially incidents that do not fall within the jurisdiction of any particular agency. It may also provide some insight into public and media perception of chemical incidents.

Flow of Information

Current System

Initial federal reporting of incidents is primarily through the NRC. Approximately 30,000 cases per year are reported in this manner. The NRC maintains these initial reports in a database called the IRIS Incident Reporting Information System. The NRC uses three different reporting formats. A standard discharge report, a railroad report and one for oil spills from ships.

The NRC selectively forwards this initial information to approximately 16 other federal agencies and to state agencies. Most of the agencies discussed in this report receive notifications from the NRC. It appears that OSHA and USFA do NOT receive notification. (*this needs to be verified)* OSHA relies on self-reporting of injuries by the employer. The USFA relies on reporting by local fire departments and Hazmat teams. Some agencies such as ATSDR employ a number of additional sources such as local fire departments, industry, medical providers and news media. The EPA may also collect additional reports from its regional offices, incorporating them in the ERNS database.

The various agencies process portions of this information, conduct investigations, and make reports within the scope of the agency. There is no overall summary or evaluation of the information.

Agencies such as the Mine Safety and Health Administration, Department of Energy and Department of Defense maintain their own separate reporting systems.

A flow chart showing the current flow of information is shown in Figure 1.

Proposed System

The NRC should be the focal point of all reporting regarding chemical incidents. Other agencies that receive independent notifications of incidents should be required to notify the NRC so that the NRC receives a complete set of reported incidents. The database manager would notify the NRC of any incidents that were found through news media and other sources and not previously reported. Every incident could then be followed through the system based on its NRC assigned number.

Each agency would continue to perform its normal functions of collection, filtering vetting, investigation and reporting. The processed information would then flow into the Repository. The Repository manager would perform additional filtering, vetting, translation of non-standard data, and identify and merge duplicate

reports. Vetting would include telephone, fax and written follow-ups to confirm and correct data as needed.

The resulting repository would then be made available on-line in a fully searchable system and for download or distribution on CD ROM in standard formats.

A flow chart showing the current flow of information is shown in Figure 2.

National Chemical Incident Repository Development Plan
Current Information Flow
August 7, 2000

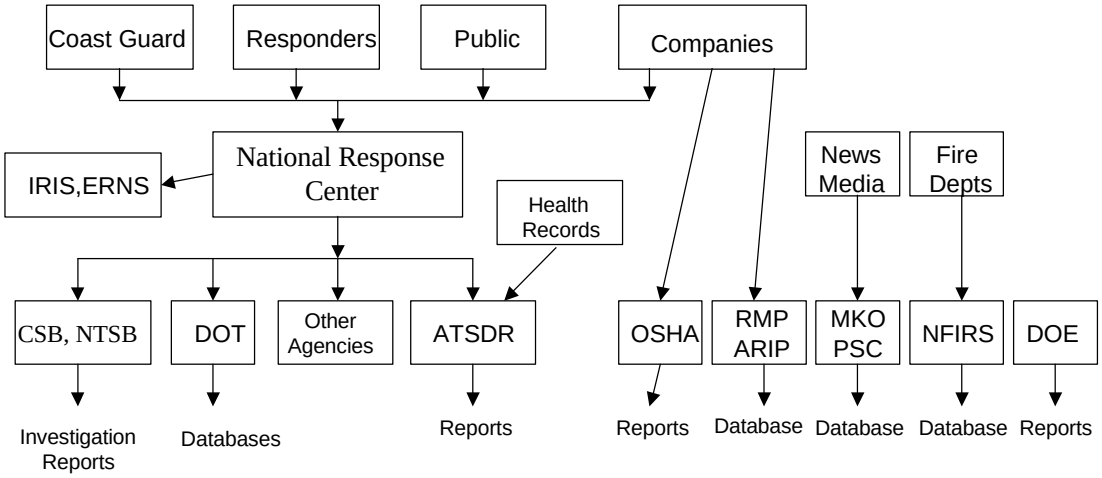

FIGURE 1: CURRENT FLOW OF INFORMATION
NATIONAL CHEMICAL INCIDENT REPOSITORY DEVELOPMENT PLAN

National Chemical Incident Repository Development Plan
Proposed Information Flow
August 13, 2000

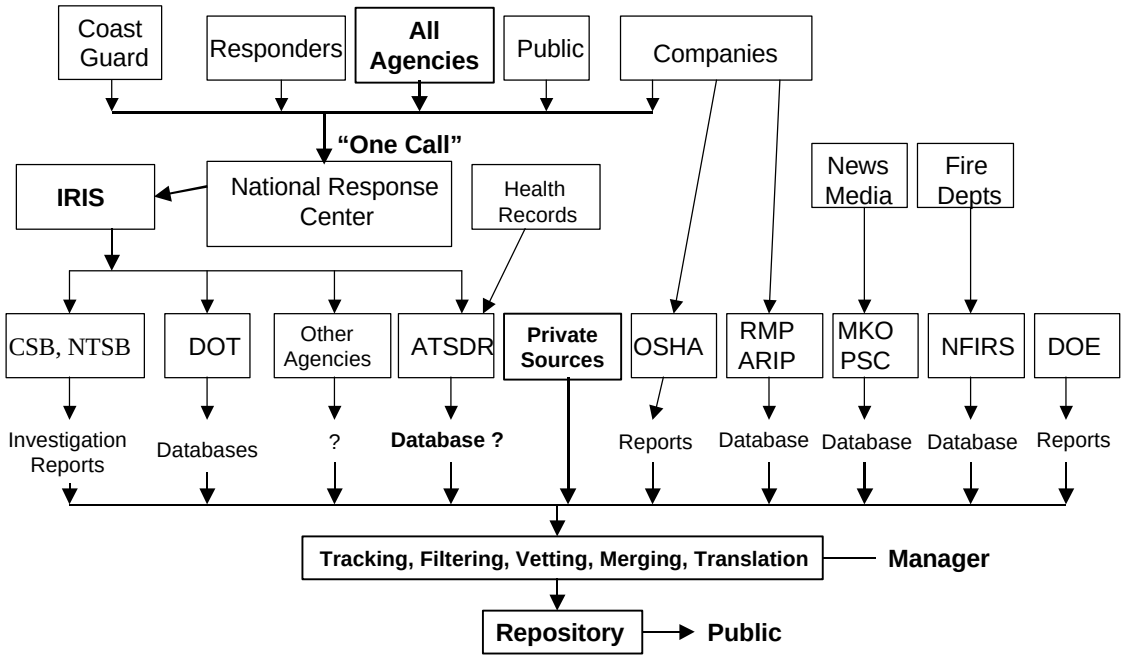

FIGURE 2: PROPOSED FLOW OF INFORMATION
NATIONAL CHEMICAL INCIDENT REPOSITORY DEVELOPMENT PLAN

Repository Manager's Functions

Tracking Incidents through System

Filtering Incidents

Vetting Incident Data

"to subject to expert appraisal or correction"

Merging Incident Data from Various Sources

Translating Data from other Sources

Comparing News Reports to Government Reporting

Providing Access to the Public

Recommended Definition of and Scope of Incidents

An incident is the unintended release of or exposure to a hazardous substance, which results in or might reasonably have resulted in, deaths, injuries, significant property or environmental damage, evacuation or sheltering in place.

Hazardous substances are all chemicals that due to their toxicity, reactivity, flammability, pressure or temperature present a potential hazard to people, the environment or property. (*asphyxiants)*

Threshold Quantities?

Threshold dollars?

Business Interruption?

Litigation?

Fines?

Exclusions and Inclusions

Inherently illegal activities such as illicit drug manufacturing, arson, and terrorism.

Residential fires unless caused by natural gas or lpg distribution systems, but excluding an attached appliance. (*I think there is a limit on the extent of responsibility of lpg delivery companies to inspect the system)*

Vehicle fires and spills of the vehicle's fuel tanks are excluded. Incidents involving fuel carried as cargo would be included.

Drug overdoses and poisonings would be excluded.

Drowning in water would be excluded, unless other chemicals are involved.

Poisoning due to carbon monoxide as a result of poor combustion in a residence or vehicle would be excluded???

Incidents in private residences involving consumer products used by the occupants would be excluded. ??? (*should review with Consumer Product Safety Commission)*

Mine fires and explosions involving naturally occurring gases would be excluded. An explosion of leaking hydraulic fluid in a mine would be included.

Incidents on offshore platforms off the US coasts and in the Gulf of Mexico would be included.

Incidents at government facilities would be included.

Incidents involving radioactive materials would be excluded unless a chemical reaction caused or significantly contributed to the incident.

Long term, slow, leakage such as from underground gasoline storage tanks would be excluded.

Recommended Scope of Data

Location

Owners and Operators

Type of Facility or Mode of Transportation

Type of process, activity, and products

Consequences
- **Human – Employees, Contractors, Employee and Public Responders**
  - **Responders, General Public (On-Site and Off-Site)**
- **Environmental**
- **Monetary**

Chemicals Involved

Equipment Involved

Causes

Weather Conditions

Remedial Action

Emergency Response

Agency Administrative Information

Scope of Current Data Sources

HSEES by ATSDR

A reportable event is “an uncontrolled, illegal or threatened release of hazardous substances (excluding petroleum products) which involves substances that need to be removed, cleaned up or neutralized according to federal, state or local law. A threatened release which leads to a public health action such as an evacuation, traffic rerouting or wearing personal protective equipment also qualifies for inclusion in the study. If a release includes petroleum products with other hazardous substances which meet event criteria, the release is a reportable event.”

Due to the large volume of events that occur in Texas, the Texas HSEES project also adds the criteria that the release quantity must be greater than 10 pounds or 1 gallon (unless the CERCLA RQ is 1 pound).

Fixed facility events were events that outdoors or inside the buildings on the premises of a facility or site. Some examples of fixed facilities are industrial sites, manufacturing plants, businesses, farms, schools, hospitals, and private residences.

Transportation events involved ground, rail, water, air or pipeline transport and occurred outside a fixed facility.

Comments

Data is currently collected by 14 state agencies. The states involved may vary from year to year.

HSEES excludes petroleum products.

HSEES provides more information about the type of injury and use of personal protective equipment than other sources.

Reporting should not be based on ever changing legal requirements.

RMP by EPA

The release must be from a covered process and involve a regulated substance held above its threshold quantity in the process.

The release must have caused at least one of the following:

On-site deaths, injuries, or significant property damage or

Known off-site deaths, injuries, property damage, environmental damage, evacuations, or sheltering in place.

A release from a regulated process where the regulated substance is held below its threshold quantity does not have to be reported even if it causes a fatality.

The first 5 year accident history contains approximately 1900 incidents.

Comments

Reporting should not be based on arbitrary thresholds of quantities in the process, especially if there is known consequences. Most injuries are caused by releases much smaller than the thresholds. Only about 400 incidents per year are being reported per these criteria.

ARIP by EPA

This system has essentially been replaced by RMP. However it contains nearly 5000 incidents compared to RMP's 1900 incidents for the first 5 years. The selection of incidents to be included was somewhat arbitrary.

AIS by OSHA

This system is intended to assist in tracking incident investigations. However it does contain text descriptions of what appears to be several thousand chemical incidents. All involve fatalities or injuries.

Comments

This system contains valuable information on chemical incidents resulting in injuries or fatalities. There are no arbitrary limitations due to type of facility, chemical lists or threshold quantities.

HMIS by DOT/OHM

?? By DOT/OPS

NFIRS by USFA

This voluntary system is populated by reports from fire departments. It is estimated that 42% of departments participate. They may or may not also furnish HazMat information. The system does include input forms for HazMat incidents.

Overlaps and Gaps

Databases

NRC / EPA – IRIS / ERNS
EPA - ARIP
EPA - RMP
OSHA - AIS
USFA - NFIRS
DOT / OHM - HMIS
DOT RSPA / OPS
ATSDR - HSEES
MKOPSC – NBIRS
Private Sources – Industry Groups, Insurance Companies, Consultants, Individual Companies

Investigative reports

CSB
NTSB

Recommended Short Term Improvements in Data Accessibility

Following are recommendations for improvements that could be made at "reasonable cost" in the near term of a few months to a year or two. These tasks could be accomplished by the agencies and organizations and/or the Mary Kay O'Connor Process Safety Center. These recommendations are based primarily on observations of what is currently available on the WWW and will undoubtedly need to be modified after more detailed discussions with those agencies responsible for the data.

ERNS and NRC

These are two very similar sources of preliminary reports of releases. While the information is preliminary and often incomplete it does cover the entire spectrum of release sources and chemicals. There may also be duplication of incidents.

The NRC has the lead role in this function of gathering initial reports and disseminating the information to other agencies and organizations. These agencies may respond physically to the incident or it may trigger further data collection or investigation.

ERNS – Data is available from 1987 to the present. There is no online search capability. The data is available as a large number of flat files that can be downloaded into a database or spreadsheet.

Access should be enhanced by joining the files into a single fully searchable database. Multiple reports of an incident should be identified and the records modified to indicate this.

NRC – Data is available from 1991 to the present. There are online search capabilities but they are limited to a few fields and not sufficient for research purposes.

The yearly data can also be downloaded into a database.

Access should be enhanced by joining the files into a single fully searchable database

In the future a single initial reporting database should be utilized. It should provide the basis for the identification and tracking of all chemical releases. The system should insure that all releases are reported to the NRC and that all relevant organizations are notified of releases.

ARIP – Data for this system was collected primarily from 1986 to 1992 and is now replaced by the RMP 5 year accident history reporting system. Nearly 5,000

releases are contained in this database. Text descriptions of the accidents are available in paper form only. The database can be downloaded in standard PC formats. There are NO online search capabilities. The MKO PSC has a modified version of the data in which such items as misspelled chemical names and CAS numbers have been corrected.

The text data should be added to the database along with the corrections and a fully searchable version made available online.

RMP – Data is available from 1994 through 1999. The information available is very similar to the ARIP system. An online query system exists but is limited to a few fields and is inadequate for research purposes.

The online version should be made fully searchable.

The database is available As A Microsoft Access database on CD ROM. A flag should be added to identify the most current RMP from a facility.

HSEES – by the ATSDR – Data has been collected since 1990 and reported through 1997. Approximately 14 states participate in this program. Reports focus on the chemicals involved and their health effects. The underlying database is NOT available to the public. Petroleum products are not included.

A fully searchable online database should be made available.

Consideration should be given to including petroleum products.

HMIRS – by US DOT – Data available from 1993 to 1999. All transportation modes **except** pipelines. DBF files available by download for each year. Yearly and ten year summary tables are available on-line.

DBF files should be joined into a single database available on-line or CD ROM.

NFIRS – by USFA – Available at some cost on CD ROM. Data is stored in a difficult format not readily transferable to popular PC based database programs.

Should be made available on-line or on CD ROM in a standard PC format.

NBIRS – by MKOPSC – This system is in development and not yet available to the public. The design should be finalized and made available on-line.

CIRC – by CSB – This system contains basic information regarding selected incidents.

AIS – by OSHA – Text summary of OSHA investigations. Should be made available in an electronic format that can be included in the integrated system.

Recommended Modifications to Existing Data Collection and Reporting Systems.

Databases

NRC / EPA – IRIS / ERNS
EPA - ARIP
EPA - RMP
OSHA - AIS
USFA - NFIRS
DOT / OHM - HMIS
DOT RSPA / OPS
ATSDR - HSEES
MKOPSC – NBIRS
Private Sources – Industry Groups, Insurance Companies, Consultants, Individual Companies

Investigative reports

CSB
NTSB
EPA
OSHA

Barriers to Implementing Repository

Appendix A – Spreadsheet Summary of Data Sources

Appendix B – Roundtable Repository Development Committee Members

Appendix C – Definitions

Appendix D – Acronyms

NRC	National Response Center, operated by US Coast Guard
IRIS	Incident Reporting Information System
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
RMP	Risk Management Plan
ARIP	Accidental Release Information Program
DOT	US Department of Transportation
OHM	Office of Hazardous Materials
HMIS	Hazardous Materials Incident System
RSPA	Research and Special Projects
OPS	Office of Pipeline Safety
MKO-PSC	Mary Kay O'Connor Process Safety Center
NBIRS	News Based Incident Reporting System
USFA	US Fire Administration
NFIRS	National Fire Information Reporting System
CSB	Chemical Safety and Hazard Investigation Board
CIRC	Chemical Incident Reports Center
OSHA	Occupational Safety and Health Administration
AIS	Accident Investigation Summary

Appendix E – Bibliography

User's Guide to Federal Accidental Release Databases, EPA CEPPO and NRT, September 1995

Inventory of Federal Data Systems in the United States for Injury Surveillance, Research and Prevention Activities, US Dept of HHS, CDC, NCIPC, May 1996