Development of a National Spill Test Facility Data Base

**Topical Report
February 1994 - February 1995**

February 1995

Work Performed Under Contract No.: DE-FC21-93MC30126

For
U.S. Department of Energy
Office of Fossil Energy
Morgantown Energy Technology Center
Morgantown, West Virginia

MASTER

By
Western Research Institute
University of Wyoming Research Corporation
Laramie, Wyoming

DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

This report has been reproduced directly from the best available copy.

Available to DOE and DOE contractors from the Office of Scientific and Technical Information, 175 Oak Ridge Turnpike, Oak Ridge, TN 37831; prices available at (615) 576-8401.

Available to the public from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161; phone orders accepted at (703) 487-4650.

DEVELOPMENT OF A NATIONAL SPILL TEST
FACILITY DATA BASE

Development of a National Spill Test Facility Data Base

**Topical Report
February 1994 - February 1995**

Work Performed Under Contract No.: DE-FC21-93MC30126

For
U.S. Department of Energy
Office of Fossil Energy
Morgantown Energy Technology Center
P.O. Box 880
Morgantown, West Virginia 26507-0880

By
Western Research Institute
University of Wyoming Research Corporation
P.O. Box 3395
Laramie, Wyoming 82071

February 1995

ACKNOWLEDGMENTS

This report was prepared with the support of the U.S. Department of Energy (DOE), Morgantown Energy Technology Center, under Cooperative Agreement Number DE-FC21-93MC30126. However, any opinions, findings, conclusions, or recommendations expressed herein are those of the author and do not necessarily reflect the views of the DOE.

TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	iv
INTRODUCTION	1
Background	1
Purpose	2
METHODOLOGY	4
STF Spill-Test-Related Data Files	4
Pre-1988 Data	5
Post 1988 Data and Ongoing Data Base Update	5
Literature Searches	6
CAAA 112(r) Chemicals List	7
RESULTS AND DISCUSSION	8
CONCLUSIONS	9
APPENDIX A:	
Duties of the Chemical Safety and Hazard Investigation Board	11
APPENDIX B:	
Sample Selection of Bibliography	12
APPENDIX C:	
Sample Printout From National Spill Test Facility Data Base	14
APPENDIX D	
EPA-Proposed Rule Requires Risk Assessment	19
DISCLAIMER	21
BIBLIOGRAPHY	22

EXECUTIVE SUMMARY

In the United States, the production of gas, liquid and solid fuels and the associated chemical use accounts for significant volumes of material with the potential of becoming hazardous. Accidental spills or releases of these hazardous materials do occur, and action must be taken to minimize damage to life, property, and the environment.

Because of the hazards of testing with chemical spills, a national spill test facility (STF) and an associated testing program have been established to systematically develop new data on the effects and mitigation of hazardous chemical spills. The combined Superfund Amendments and Reauthorization Act (SARA) and Clean Air Act and Amendments (CAAA) of 1990 directed the Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) to work with the Desert Research Institute (DRI) of Nevada and Western Research Institute (WRI) of Wyoming, as well as private industry, to develop and implement emergency response technology at the STF and to test and evaluate technologies that could be used to respond to liquefied gaseous and other hazardous substance spills.

As part of this effort, Western Research Institute (WRI), in conjunction with the DOE, is developing a comprehensive national spill test data base. The data base will be easily accessible by industry and the public on the Spill Research Bulletin Board System and will allow users to download spill test data and test descriptions, as well as an extensive bibliography.

The 1990 CAAA requires that at least two chemicals be field tested at the STF and at least 10 chemicals be studied each year. The chemicals to be studied are chosen with priority given to those that present the greatest risk to human health. The National Spill Test Facility Data Base will include a common chemical data base covering the overlap of federal chemical lists and significant information from other sources. Also, the CAAA directs the DOE and EPA to work together with the STF and industry to provide a scientific and engineering basis for writing regulations for implementation of the CAAA. The data base will be a primary resource in this effort.

By incorporating past test data, as well as adding new test data and other valuable data into the data base, WRI and the STF are providing a resource for evaluating hazard management technologies, facilitating the technology transfer required for new development of emergency response technology, providing a scientific

rationale for the drafting of new CAAA regulations and helping industry to best comply with new CAAA mandates.

The quality and efficiency of use of the Nevada STF has improved as a result of the use of data being generated through the National Spill Test Facility Data Base and the WRI/DRI CAAA program. The data base continues to support the DOE and EPA in their work with industry, to help prevent duplication of effort, and above all, to support a scientific and engineering basis for writing regulations for implementation of the CAAA.

INTRODUCTION

In the United States, the production of gas, liquid and solid fuels and the associated chemical use accounts for significant volumes of material with the potential of becoming hazardous. Accidental spills or releases of these hazardous materials do occur, and action must be taken to minimize damage to life, property, and the environment. Public awareness of chemical spills has increased in recent years, especially following the Bhopal, India, disaster.

While new and better data are needed to improve chemical safety, any useful chemical release data from the measurement of actual accidents will always be limited by (unfortunate) opportunity. Yet the need for new and improved data continues to increase, along with the volumes of corrosive, flammable, and toxic chemicals being produced, manufactured, stored, and transported. Because of the hazards of testing with chemical spills, a national spill test site and an associated testing program have been established to systematically develop new data on the effects and mitigation of hazardous chemical spills. As part of this effort, Western Research Institute (WRI), in conjunction with the U.S. Department of Energy (DOE), is developing a comprehensive national spill test data base. The data base will be available to industry and the public on the Spill Research Bulletin Board System and will allow users to download spill test data and test descriptions as well as an extensive bibliography.

Background

In 1983, Congress appropriated funds to provide the nation with a \$7.9 million facility where industry and government could evaluate technologies for emergency management of fuels and other chemicals. This Liquefied Gaseous Fuels Spill Test Facility (LGSTF, more commonly known as STF) is located on the Nevada Test Site, near Mercury, Nevada. Responsibility for the STF program resides with the director of the U.S. Department of Energy Office of Emergency Management. The STF is the only facility of its kind for large-scale testing of hazardous materials and fuels, and it provides the added capability of large wind tunnel testing under controlled conditions.

Because of public safety issues and the need to maintain American competitiveness in processes and products, Congress has continued to support the STF. In 1986, with the Superfund Amendments and Reauthorization Act (SARA) and its Title III

Emergency Planning and Right-to-Know Act, Congress directed the DOE to continue to provide the nation with this facility, as well as a program to produce experimentally verified data on releases of fuels and other chemicals.

Purpose

The combination of the SARA and the Clean Air Act and Amendments (CAAA) in 1990 provided the primary impetus for the establishment of the National Spill Test Facility Data Base. This legislation directed the Environmental Protection Agency (EPA) and the DOE to work with the Desert Research Institute (DRI) of Nevada and Western Research Institute (WRI) of Wyoming, as well as private industry, to develop and implement emergency response technology at the STF and to test and evaluate technologies that could be used to respond to liquefied gaseous and other hazardous substance spills. The SARA-directed development of spill technology includes the establishment of a DOE/STF data base. The purpose of this National STF Data Base is largely to serve as an archive for these test data on chemical spills that could threaten public health or the environment.

The program mandated by Congress requires that at least two chemicals be field tested at the STF and at least 10 chemicals be studied each year. The chemicals to be studied are chosen by the administrator of the EPA in consultation with the Secretary of Energy, with priority given to those chemicals that present the greatest risk to human health. The National STF Data Base will include a common chemical data base covering the overlap among other federal chemical lists, including those of the National Occupation and Safety Act (OSHA), the National Institute of Occupational Safety and Health (NIOSH), the Department of Transportation (DOT), and the EPA. This chemical data base will serve not only as an information databank, but also as a source of emergency information in the event of a hazardous chemical spill.

Also, the 1990 CAAA directs the DOE and EPA to work together with the STF and industry to provide a scientific and engineering basis for writing regulations for implementation of the CAAA. The data base will be a primary resource in this effort.

The worker and the public are being protected by industrial management practices and procedures stemming from industry compliance with DOT and OSHA regulations. Under current EPA regulations (40 CFR, Subpart D 264.50), any facility having hazardous materials on site must prepare and implement a site-specific

contingency plan and emergency procedures document. Employers whose employees perform cleanup operations (OSHA 29 CFR 1910.120) at hazardous waste sites or whose facilities are permitted by the Resource Conservation Recovery Act (RCRA), are required to prepare and implement a site safety and health plan. These site safety plans do not always contain the information to enable adequate emergency planning and document preparation on some chemical hazards. This data base will enhance the efficacy of these regulations.

Companies in the hydrocarbon and other chemical industries recognize that, as with any business, maintaining worker safety, public safety and environmental quality are critical to remaining competitive. Nevertheless, the implementation schedule for regulation of air toxins in Title III of the Clean Air Act of 1990 is of concern to them because, to comply, they must examine their products, the control and monitoring of their products and processes, and their transportation systems. Compliance with the risk management plan (RMP) rules proposed for implementation in 1997 will have an economic impact of over \$200 billion or more for 140,000 facilities associated with hydrocarbon and other chemical production, transportation, and use (See Appendix A). The availability of the data base will aid businesses in achieving compliance with CAAA mandates, while improving their efficiency and effectiveness in doing so. Considerable savings in time and cost should result.

Although some private companies maintain comprehensive chemical spill data bases, most of these remain proprietary. The efforts of the STF to work with industry to develop new data and to make critical information available are intended to benefit American competitiveness by supporting industry's efforts to maintain safety and environmental quality, while maintaining profitability.

By incorporating past test data, as well as adding new test data and other valuable data into the data base, WRI and the STF are providing a resource for evaluating hazard management technologies, facilitating the technology transfer required for new development of emergency response technology, providing a scientific rationale for the drafting of new CAAA regulations and helping industry to best comply with new CAAA mandates.

The National Spill Test Facility Data Base project was initiated through the WRI program on hydrocarbon and chemical spill technology development and was approved for the DOE cooperative agreement program for FY 1994. Because the

benefits to the public and industry are so great, and because the pressures to draft CAAA regulations and industry's pressures to meet them have lent urgency to the effort, WRI has determined that an accelerated effort to develop the National Spill Test Facility Data Base is necessary.

METHODOLOGY

Work on the National Spill Test Facility Data Base focuses on providing publicly available, non-proprietary spill test data in a form that is comprehensible and useful to a broad spectrum of users. The data base plan includes efforts to convert DOE files to a form that is easily accessible and widely available. The data base includes an up-to-date subject-indexed bibliography; existing DOE data files from past tests; mailing list of current and past test sponsors; references to information on accidental spills of hazardous chemicals; results of the EPA/DOE CAAA-STF collaborative R&D program; and documentation of future research needs of current related programs. Efforts include, to the extent possible, ensuring the accuracy of data collected by WRI from all sources. However, WRI is not condensing, or otherwise modifying the data.

WRI's national STF data base project was begun by incorporating three existing data bases. These include pre-1988 STF (DOE) data stored at the Lawrence Livermore National Laboratories (LLNL) in Livermore, California; post-1988 STF data from the DOE; and other DOE contractor data. The data files are first converted from their original file format into Standard International (SI) units, such as those used in method ASTM E 380. Once files are formatted, we complete quality checks before transferring them onto the DOE automated data system, where they are made available to industry and the public.

STF Spill Test-Related Data Files

Efforts have continued to establish a complete set of data files for all test series conducted at the STF. WRI is preparing appropriate documentation for each data set. For some test files, we have prepared a general description of the data and their organization. This includes auxiliary files that describe general test conditions, the placement of sensors and the location of the instrument tower at the STF. This is important because the facility is equipped with a data acquisition system that uses

data channels to automatically record and transmit data from the instrumentation at the spill site.

The majority of the paper archives gathered are publications that describe these STF test series. For some, all that is required is to select those sections that should be included and referenced as part of a final data set. For example, WRI has collected LLNL internal, unpublished reports that should be referenced. This work also includes generating a table for each data set that lists the scientific units associated with each data channel reported.

Pre-1988 Data

From 1977 until 1992, the national data base on chemical spill research and STF testing resided at the Lawrence Livermore National Laboratory. Access to this data was limited. Currently, WRI is reviewing the pre-1988 LLNL data, identifying entries to be included in each data set, and making appropriate changes to some of the files based on follow-up with the LLNL. Gaps have been identified in about 90% of the LLNL DOE spill test data, and we have filed reports with DOE regarding those data gaps that we cannot resolve internally.

Post-1988 Data and Ongoing Data Base Update

WRI has also attempted to document post-1988 spill test data files that are not in the original data sets but are cited in the published literature. We are developing documentation for each data set where it exists. Reports covering test activities at the STF during 1990 are being identified for inclusion with spill test facility data from the National Technology Information System (NTIS).

Archiving ongoing spill test results from the facility includes the cataloging of documents and data from:

- DOE stewardship of tests at STF;
- CAA data from 1993 to present; and
- industry experience.

Much of the new data that are continually being developed at the national STF, such as documents for hazardous chemical test plans and chemical hazards data, must be input manually. The update and conversion into ASCII file format for inclusion in

user data packages should be completed in July 1995, provided the DOE data are delivered as promised. This, however, is dependent on the delivery to them of new data from the CAAA-STF program being conducted with the EPA.

A primary goal of our activities is to develop a data base on simulated accidental releases of fuels and chemicals. In general, data have been captured at the STF by conducting simulated spills or gas releases under given meteorological conditions and deploying chemical sensors to monitor their behavior, as designed by the test sponsors. The chemical spills technology program for industry includes data acquisition for hydrocarbon and chemical spill prediction and mitigation development. Included is the companion objective to ensure that the government's STF data are made available to the chemical and petrochemical industries' health and safety programs.

Another goal is to maximize the use of the STF data by nonfederal entities to assist in compliance with rule-making schedules for major titles of the CAAA of 1990. WRI is making this information available to the CAAA-STF program, private, and public sectors. WRI is reviewing spill test-related documents, assembling spill test-related data, communicating with STF users, and suggesting program directions and enhancements to DOE. These data support efforts to:

- document and archive new spill test results;
- develop emergency action plans to respond to spills;
- conduct training of spill response personnel; and
- establish safety standards for personnel engaged in spill response activities.

Literature Searches

Literature searches and analyses of the spill test bibliography (See Appendix B) carried out under a previous contract have been merged with current bibliographic updates. Each bibliographic entry is being coded and entered into the data base, using the FoxPro software package, and the spill bibliography is being continually updated.

Lists of important journals on spills have been searched, as well as lists for hazardous chemicals by production and transportation volume. Accidents in the chemical industry report are under review. Literature searches for references to

pertinent hazardous spill control technology have also continued, including searches for information on plume dispersion tests done on chemicals newly approved for test releases at the STF site. A list of citations of the bibliography is being assembled with the idea of publishing and distributing it so that these papers will be read as widely as possible within the industry.

WRI is collecting copies of reports, published and unpublished. Frequently, unpublished results from ongoing projects are reported at national chemical safety workshops. Obtaining documentation on these projects (For example, a report on ensuring safe design and operation of pilot plants was presented at the International Workshop on Hazard Assessment and Disaster Mitigation in Petroleum and Chemical Process Industries, in Madras, India.) has proven more difficult and is requiring more time than accessing journal references.

Also, as a result of an exchange arrangement, WRI is attempting to obtain and incorporate publications received from the health and safety executive of Great Britain. Data that are pertinent to the U.S. chemical spills data base are also being collected in Europe from related international organizations.

CAAA 112(r) Chemicals List

Section 112(r) of the CAAA specifies that the administrator of the EPA, in consultation with the Secretary of Energy, is to choose 10 chemicals to be studied and two chemicals to be field tested at the STF each year. Priority is to be given to those chemicals that present the greatest risk to human health. Section 103(f) of CAAA requires the EPA to work with the DOE to develop an experimental and analytical research effort, which will be carried out at the STF, working with the chemicals on the list.

Some of the hazardous chemicals listed in PL101-549, 112(r) are also listed by the U. S. Department of Transportation in the 1993 *Emergency Response Guidebook*, by the National Institute of Occupational Safety and Health (NIOSH) *Pocket Guide to Chemical Hazards*, by the U. S. Department of Health and Human Services, and in the Occupational Safety and Health Act (OSHA) CFR 29, section 1910-1200.

WRI developed an approach to compare these lists so they can be used to determine which chemicals should be tested in order of priority. First, the chemicals

listed as hazardous in Section 112 of Title IX of Public Law 101-549 of the CAAA were cross-listed with the *Chemyclopedia 94*, a manual of readily accessible chemicals that are commonly used and transported. If the chemicals were found to be cross-listed in each document, further information was sought. A variety of properties were identified for each chemical. A list of constants was also assembled, and will be used later to estimate the emission rate and/or source term of any of these chemicals at various temperatures in case of an actual spill.

RESULTS AND DISCUSSION

The conversion of the post-1988 data collected at the STF has been completed. A small number of data sets received from DOE contractors at the STF are being reviewed for any inaccuracies. We are in the process of determining how best to manage and manipulate the data to an interim common and internal storage of STF data at WRI. Other accomplishments include the acquisition of test plans and key contact names to enable us to perform relevant archiving of post-1988 data collected at the STF.

References found in the literature have been collected and added to the bibliography using computerized search applications. About 1,700 entries have been added to the bibliography since work began. Additionally, keywords have been added and a check of the entries has been completed. More entries are added every week. This portion of the data base is already being used to transfer data to participants in the research program for the development of emergency response technologies. An example of the bibliography accessed for references is shown in Appendix B.

Some of this quarters' work has been to support data acquisition and planning for the WRI/DRI and CAAA-STF/EPA teams who will be field testing CAAA-CO₂, Cl, and NH₃ in FY 95. (See Appendix D.) This has entailed reviewing the data on the meteorology at the STF, developing the release system for a low-momentum ground source, preparing for a quick-release source, developing surface roughness and equivalent roughness patterns for the dispersion area and grid location, and determining sensor deployment. This research, co-funded by DOE and EPA, is leveraged by attaching the tests to the 1995 Chemical Hazards of Atmospheric

Releases Research (CHARR) roughness tests. The field data will be generated in August for industry and in September for the CHARR. This will also aid the STF mission to have spill test results in a format allowing for data comparison.

The CAAA 112(r) chemical data are in place for use by the EPA to decide which chemicals should be tested at the STF in order of priority. It also offers data base users a better understanding of how the opportunity for accidents is affected by storage, transportation and distribution. At present, the data base focuses mainly on the most common hazards, while work on those chemicals not found to be commonly used has been set aside.

CONCLUSIONS

The importance of the National STF Data Base is illustrated by the steady activity the data base has seen from industry, which is conducting research for accident prevention reference manuals, process design considerations, physical plant design considerations, procedures and practices such as hazardous release response/leak plugging, secondary containment, steam curtains, spray and foam control technology. The data base is also proving of great value to government agencies. For example, data on the use of foams to control vapors from hazardous spills is of current interest to the Environmental Protection Agency because of regulations requiring maximum achievable control technology (MACT).

By providing ready access to a bibliography of the literature and to the existing data sets, the data base is contributing to the design of chemical spill tests so that the resulting data are scientifically acceptable to a large audience. Any experimental plan for the simulation of chemical spills at the STF begins with a careful review of the literature and an analysis of the existing data sets. Other inputs to the planning come from assessments of existing model formulations and hypotheses concerning improvements.

Building on the bibliography and the chemical spill data sets collected since 1985, and now contained in the data base, WRI has developed program goals to develop chemical spills technology for industry. The first major effort includes projects that provide data:

- 1) to improve model formulations for short, finite duration releases under a range of atmospheric conditions (e.g., daytime and nighttime) and industrial site conditions;
- 2) to demonstrate, using field data, improved model accuracy with enhanced formulations for a range of meteorological and industrial site conditions; and
- 3) to develop control technology and improve mitigation to provide for corrective measures when accidents occur and to provide risk management plans (RMP) to the commercial sector. (This is a longer-term goal.)

The quality and efficiency of use at the Nevada STF has improved as a result of the data being generated through the National STF Data Base and the WRI/DRI CAAA program. The CAAA program has brought about cooperation of a number of scientific observers for chemical spill tests. The National Spill Test Facility Data Base continues to support the DOE and EPA work with industry, to help prevent duplication of effort, and above all, to support a scientific and engineering basis for writing regulations for implementation of the CAAA.

Appendix A

Duties of the Chemical Safety and Hazard Investigation Board

Title III of the CAAA, 112(r) mandates the role of the Chemical Safety and Hazard Investigation Board. The authorities of the Board are as follows:

- 1) Investigate and report all facts pertaining to an accidental release involving death, injury, or damage.
- 2) Periodically report to other government agencies ways to reduce the likelihood and/or consequences of accidental releases.
- 3) Establish regulations for reporting accidental releases.
- 4) Research and study potential releases.
- 5) Compile a recommended list of extremely hazardous substances (including threshold quantities for each substance).
- 6) Recommend regulations to be adopted for the prevention of accidental releases (within two years after the enactment of the Clean Air Act Amendments of 1990).
- 7) Submit an annual report to the President and to the Congress addressing investigations covered, legislative recommendations (and what was done by other agencies to implement these legislations), and whatever else that is seen as pertinent.

Appendix B

Sample Selection of Bibliography

- Andronopoulos, S.; Bartzis, J.G.; Wuertz, J.; Asimakopoulos, D., 1993, Simulation of The Thorney Island Dense Gas Trial No. 8, Using The Code Adrea-Hf. Process Safety Progress, Vol. 12, No. 1, 61-66.
- Aznakayev, E. G., 1991, Transport Processes In Dense Gas Mixtures. Fluid Mechanics, Soviet Research, Vol. 20, No. 5, 114-118.
- Bardon, M. F.; Rao, V. K., 1991, Estimating Instantaneous Properties of Vaporizing Light Petroleum Fractions. Combustion and Flame, Vol. 84, No 3-4, 427-431.
- Castro, I. P.; Kumar, A.; Snyder, W. H.; Pal, S.; Arya, S., 1993, "Removal of Slightly Heavy Gases From a Valley by Crosswinds". Journal of Hazardous Materials, Vol. 34, No. 3, 271-293.
- Cramer, M. S., 1992, Dynamics of Dense Gases. Basic Research Need in Fluid Mechanics American Society of Mechanical Engineers. Fluids Engineering Division (Publication) FED, Vol. 134. New York: ASME, 17-21.
- Cramer, M. S.; Crickenberger, A. B., 1992, Prandtl-Meyer Function For Dense Gases. AIAA Journal, Vol. 30, No. 2, 561-564
- D'Agostino, Louis A., 1989, Developments in Chlorine Gas Detectors. Advances in Instrumentation, Vol. 44. Research Triangle Park: ISA Services Inc, 283-286.
- Guinnup, Dave, 1992, Non-Buoyant Puff and Plume Dispersion Modeling Issues. Plant/Operations Progress, Vol. 11, No. 1, 12-15.
- Hshieh, F. Y.; Richards, G. N., 1991, Infrared Investigation of the Oxygen Chemisorption Of Wood Char. Combustion and Flame, Vol. 84, No. 3-4, 423-426.
- Kaye, S.R.; Schroter, R.C., 1993, Experimental Model of Gas Dispersion and Uptake at the Bronchial Wall. Journal of Biomechanical Engineering, Transactions of the ASME Vol. 115, No. 1, 91-96.

- Matthias, C. S., 1992, Dispersion of a Dense Cylindrical Cloud in a Turbulent Atmosphere. Journal of Hazardous Materials, April, 117-150.
- Meroney, R. N.; Shin, S. H., 1992, Depth-Integrated Dispersion Model Prediction of Dense Gas Dispersion in the Presence of Barriers and Water Spray Curtains. Fluids Engineering Division (Publication) FED, Vol. 143. New York: ASME, 49-56.
- Nielsen, M.; Heinrich, M.; Scherwinski, R., 1991, Research on Continuous and Instantaneous Gas Clouds. Part 2. Journal of Hazardous Materials, Vol. 26, No. 2, 219-224.
- Rewatkar, V. B.; Joshi, J. B., 1993, Role of Sparger Design on Gas Dispersion in Mechanically Agitated Gas-Liquid Contactors. Canadian Journal of Chemical Engineering, Vol. 71, No. 2, 278-291.
- Rice, R. G.; Geary, N. W.; Burns, Louis F., 1993, False Circulation Model For Absorption And Dispersion In Concurrent Bubble Columns. AIChE Journal, Vol. 39, No. 2, 224-234.
- Ronold, A., 1992, Computer Simulations of Wind and Ventilation Aid Platform Design and Safety. Institution of Chemical Engineers Symposium Series No. 130. Rugby, England: Institute of Chemical Engineers, 375-383.
- Rudyak, V.Y., 1991, Kinetic Theory of Dense Gases and Gas Mixtures. Fluid Mechanics, Vol. 20, No. 5, 133-139
- Saccomanno, F.F.; Shortreed, J. H., 1991, Societal-Individual Risks for Hazmat Transport. State and Local Issues in Transportation Hazardous Waste Materials: Proceedings of the National Conference on Hazardous Materials Transportation. New York: ASCE, 220-245.
- Vaughn, P.; Butcher, B.; Helton, J.; Swift, P., 1993, Modeling Gas and Brine Migration for Assessing Compliance of the Wipp. High Level Radioactive Waste Management, Proceedings of the 4th Annual International Conference on High Level Radioactive Waste Manage 1993. New York: ASCE, 244-251.

Appendix C

Sample Printout From National Spill Test Facility Data Base

THIS FILE DESCRIBES THE CONTENT OF THE FILES ON THE BBS.

TABLE OF CONTENTS

INTRODUCTION

- 1.0 TEST SERIES DIRECTORY DESCRIPTION
- 2.0 BIBLIO DIRECTORY DESCRIPTION
- 3.0 MAILLIST DIRECTORY DESCRIPTION
- 4.0 HELP DIRECTORY DESCRIPTION
- 5.0 TEST SERIES DESCRIPTION

INTRODUCTION

There are eleven directories of data containing files available for download on the Spill Test Bulletin Board System (ST BBS). Eight of these directories contain data from the test series conducted at the US DOE Spill Test Facility (STF) in Nevada since 1990, while the other three contain bibliographies, a mailing list, and BBS help information. A description of these directories and the data they contain follows.

1.0 TEST SERIES DIRECTORY DESCRIPTION

1.1 Files Located in a Test Series Directory

Each test directory contains one executable file for each test in the test series as well as a file named DOC.EXE that contains information documenting the test series. These executable files are actually self-extracting zip files that, when executed, create one or more comma separated value (CSV) text files containing the actual test data or other test information.

1.2 Contents and Structure of the Files in a Test Series Directory

1.2.1 Contents and Structure of the TESTxx.EXE Files

Each TESTxx.EXE file contains one to three CSV text files, TESTxx.CSV, TESTxxW.CSV, and TESTxxG.CSV, where xx is the test number. The first file, that with no W or G suffix, is the data collected by the standard data acquisition system in the control room at the STF; all of the tests on the BBS include this file. The second file, that with a W ('W' is for wind) suffix, is wind speed and direction data collected by 2m meteorological towers during the tests. The final file, that with a G ('G' is for gas) suffix, is only applicable to the Silicone Health Council (SHC) test series and contains gas concentration information. Each of these files is structured in a similar fashion. The values in the first row are the 'tag names' for each data channel. After the first row, each row in a file is a record of the input values at the time denoted by the timestamp located in the first column. A ???????? indicates that the data acquisition system did not record a valid value for that sensor at that time.

1.2.2 Contents and Structure of the DOC.EXE File

Each DOC.EXE file contains one or two text files, test.DBB, where 'test' is the test series abbreviation, and TAGNAMES.TXT. The test.DBB file is a copy of the database used to control the standard data acquisition system during a test and has some information useful in understanding the sensors associated with the tag names. Where possible, a TAGNAMES.TXT file has been included that more fully describes the sensors associated with tag names, as well as other relevant test information.

1.3 Decompressing and Accessing the Files in a Self Extracting Zip File

Once an executable file has been downloaded to your PC, extracting the data from within the file is simply a matter of executing the file from the DOS prompt or Windows File Manager. The text files contained in the executable file will be created in the directory on your PC containing the executable file. The CSV text files may be easily imported into any spreadsheet, while the TXT files may easily be imported into any word

processor or text editor.

2.0 BIBLIO DIRECTORY DESCRIPTION

This directory contains two files, BIBOLD.EXE and BIBNEW.EXE. Each is a self-extracting zip file that contain FOXPRO database files of bibliographic entries related to spill test research. The entries in BIBOLD.EXE are from work done under a DOE contract prior to 1990, while the entries in BIBNEW.EXE are from work done under DOE contract during 1994. The DBF files may be loaded into most database or spreadsheet programs. However, BIBNEW.EXE contains abstract information that is accessible only using FOXPRO or some program compatible with FOXPRO memo fields.

3.0 MAILLIST DIRECTORY DESCRIPTION

This directory contains one file, MAILLIST.EXE. It is a self-extracting zip file that contains a CSV text file of mailing list entries of people interested in or relevant to spill research and mitigation. The mailing list was compiled by the DOE.

4.0 HELP DIRECTORY DESCRIPTION

This directory contains several text files available for on-line viewing or download that describe the operation of the BBS as well as the data on the BBS.

5.0 TEST SERIES DESCRIPTION

TEST SERIES ABBREVIATION

SHC

TEST SPONSOR

Silicone Health Council (SHC) and DOE

TEST DATES

May 7, 1990 - May 14, 1990

TEST PURPOSE

Determination of Aqueous Foams Effectiveness in Extinguishing Chlorosilanes Fires and Vapor Suppression

CHEMICAL / NUMBER OF TESTS

Trichlorosilane / 7
Silicon Tetrachloride / 6

TEST SERIES ABBREVIATION

ANSUL

TEST SPONSOR

Ansul Company

TEST DATES

April 3, 1990 - April 7, 1990

TEST PURPOSE

Determination of Spill Control Agent Effectiveness in Mitigating Vapors from Hazardous and Toxic Chemicals

CHEMICAL / NUMBER OF TESTS

Chlorosulphonic Acid / 3
Sulfur Trioxide / 3
65% Oleum (SO₃ + H₂O) / 3

TEST SERIES ABBREVIATION

DOW

TEST SPONSOR

Dow Chemical

TEST DATES

June 22, 1990 - June 25, 1990

TEST PURPOSE

Determination of Water Spray Effectiveness in Mitigating Chlorine Releases

CHEMICAL / NUMBER OF TESTS

Chlorine / 6

TEST SERIES ABBREVIATION

CCPS

TEST SPONSOR

Center for Chemical Process Safety (CCPS) and DOE

TEST DATES

August 16, 1990 - September 11, 1990

TEST PURPOSE

Determination of Near Field Behavior and Aerosol Formation
from Pressurized Releases of Superheated Liquids

CHEMICAL / NUMBER OF TESTS

Chlorine / 22

Monomethylamine / 18

Cyclohexane / 20

TEST SERIES ABBREVIATION

LLNL91

TEST SPONSOR

Lawrence Livermore National Laboratory (LLNL), OSHA, and DOT

TEST DATES

May 1, 1991 - July 25, 1991

TEST PURPOSE

Determination of Protection Offered by Commercially Available
Totally Encapsulated Chemical Protective Suits Against Very
High Concentrations of Hazardous Chemicals

CHEMICAL / NUMBER OF TESTS

Hydrogen Fluoride / 17

TEST SERIES ABBREVIATION

DUPONT

TEST SPONSOR

DuPont

TEST DATES

April 7, 1992 - May 14, 1992

TEST PURPOSE

Determination of Effectiveness of Various Techniques in
Mitigating

Hazardous Material Spills and Training of Personnel to Mitigate
Hazardous Material Spills

CHEMICAL / NUMBER OF TESTS

65% Oleum/ Sulfur Trioxide / 17

Chlorosulfonic Acid / 14

TEST SERIES ABBREVIATION

LLNL92

TEST SPONSOR

Lawrence Livermore National Laboratory (LLNL) and OSHA

TEST DATES

June 29, 1992 - July 24, 1992

TEST PURPOSE

Determination of Protection Offered by Commercially Available
Totally Encapsulated Chemical Protective Suits Against Very
High Concentrations of Hazardous Chemicals

CHEMICAL / NUMBER OF TESTS

Chlorine / 10

Ammonia / 14

TEST SERIES ABBREVIATION

WRIDRI

TEST SPONSOR

Western Research Institute (WRI), Desert Research Institute
(DRI), and EPA

TEST DATES

July 22, 1993 - July 28, 1993

TEST PURPOSE

Determination of Dense Gas Dispersion Characteristics
CHEMICAL / NUMBER OF TESTS
Carbon Dioxide / 4

Appendix D

EPA-Proposed Rule Requires Risk Assessment

Section 112 (r) of the 1990 Clean Air Act Amendments (CAAA) includes steps to be taken to prevent accidental releases; provisions for sufficient modeling of accidental releases; and a definition of the role of the Chemical Safety and Hazard Investigation Board. Data is needed by users in all of these areas to help ensure worker and public safety and environmental quality. Considerations of time, resources and regulations, however, have led government and industry to take different positions on how best to generate new data to support these needs.

The EPA has taken the position that to develop models that accurately predict the complex behavior of real-world chemical spills, data must first be developed to provide an understanding of the simpler behavior of carefully controlled spills in which factors such as temperature, release rate, release geometry, and wind speed are either carefully controlled, chosen, or characterized. They believe that conducting the research this way allows each part of the model to be well understood, and thus the associated equations will closely predict spill behavior under a variety of conditions. The resulting model, however, may or may not relate to any given real-world chemical spill. Because of the time required to develop chemical spill data in this manner, this approach may not be sensitive to the implementation schedules of the CAAA.

Also under the provisions of Title III section 112(r) of the CAAA, a facility that uses more than a threshold quantity of a listed toxic or flammable substance must prepare a risk management plan (RMP) to determine if, under a wide range of conditions including worst case, there is a significant off-property threat to human health or the environment. To assess the consequence off-property, the proposed rule requires dispersion models to be used. Unfortunately, present modeling guidance from the Environmental Protection downwind for typical short duration, accidental releases at industrial facilities than if a more realistic treatment was used.

This model over-conservatism largely results from a position taken by the EPA that "the use of enhanced roughness values for simulating an accidental setting has yet to be thoroughly tested and justified." As a result, the analyses for more than 160 listed substances required by EPA's proposed RMP rule (including many hydrocarbons, H₂S, HF, etc.) will overestimate off-property risk from an accidental release by ignoring

cloud dilution generated by the wind blowing around industrial equipment and structures. By ignoring this turbulence (EPA recommends a surface roughness length not greater than 0.01 meters, which is a relatively smooth surface equivalent to cut grass), downwind concentrations predicted by the models are extremely high (by about an order-of-magnitude), producing oversized hazard zones. This overestimation of the hazard zone may result in businesses having to make costly facility modifications (e.g. mitigation systems or alternative process units).

The chemical industry has developed lists of prioritized objectives to generate the necessary data on a variety of typical industrial simulations under specified weather conditions. Their approach is based on what industry must know or do to comply with the CAAA by 1997. They are seeking regulatory approval to use more realistic, less conservative modeling technology in the hazard assessment for industrial applications (mandated RMP). The National Spill Test Facility Data Base will help industry demonstrate improved model accuracy by providing actual field-scale data. These tests to provide new data will mirror real-world situations that the industry has experienced or expects to deal with in the future. The data obtained from these tests should be immediately useful to industry in complying with the CAAA.

Therefore, the aim of this project is to reduce overly conservative risks which may lead to excessive and unnecessary controls at industry facilities.

There is time to develop the needed tools and to demonstrate their improved performance and to influence the technical guidance that EPA is developing. EPA's proposed rule requires facilities to begin the RMP process three years after publication of the final rule in the Federal Register. As the proposed rule was issued in October 1993, all work must be completed before 1997.

An agreement in principle has been reached with representatives from the U.S. government's Chemical Hazards of Atmospheric Releases Research (CHARR) steering committee, to jointly plan a major field experiment in the summer of 1995. A collaborative research effort in 1994 to support the field experiments may also be possible.

DISCLAIMER

Mention of specific name brands or models is for information only and does not imply endorsement of any particular brand.

BIBLIOGRAPHY

- 40 CFR Part 67, 1990. Title III. Hazardous Air Pollutants. Section 112 (r) of the Clean Air Act Amendments of 1990.
- 40 CFR Part 68, Draft Proposed Rule After Office of Management and Budget (OMB) Review, Risk Management Programs for Chemical Accidental Release Prevention. U.S. Environmental Protection Agency.
- Briggs, G.A. 1982. Similarity Forms for Ground-Source Surface-Layer Diffusion. Boundary Layer Meteorology 23 489-502. D. Reidel Publishing: Dordrecht, Holland, and Boston.
- Briggs, G. A., Field-Measured Dense Gas Plume Characteristics and Some Parameterizations, for International Conference and Workshop on Modeling and Mitigation of the Consequences of Accidental Release of Hazardous Materials, New Orleans, September 1995.
- Britter, R.E. and J. McQuaid. 1988. Workbook on the Dispersion of Dense Gases. HSE Contract Research Report No. 17/1988. Health and Safety Executive, Sheffield, England.
- Chandnani, M.F., Design Fundamentals, Fire Protection Manual for Hydrocarbon Processing Plants, Volume 1, Third Edition, Houston, 1985.
- Chea, S.H. et. al., The Physical Modelling of Heavy Gas Plumes in a Water Channel. 4th International Symposium on Loss Prevention and Safety Promotion in the Process Industries. The Institution of Chemical Engineers, Symposium Series No. 80, London, England, 1983.
- Cole, S., 1993 Economic Commission Sponsored Research Commission of the European Communities, Brussels, Belgium., November 9.
- Counihan, J. 1991. Wind Tunnel Determination of the Roughness Length as a Function of the Fetch and the Roughness Density of Three-Dimensional Roughness Elements. Atmospheric Environment 5 637-642. Pergamon Press (Great Britain).
- Dietz, A. G. Jr., 1985, Liquefied Gaseous Fuels Spill Test Facility, The Journal of Environmental Sciences.

- Eckert, E.R.G. and R.M. Drake. 1959. Heat and Mass Transfer. McGraw-Hill , N.Y., N.Y.
- Egami, R., W. Coulombe, J. Bowen, D. Freeman, J. Watson, D. Koracin, D. Schorran, and B. Zielinska (Desert Research Institute); D. Sheesley, J. Nordin, T. Routh, and B. King (Western Research Institute). 1995 (Draft 2). Characterization of Carbon Dioxide Releases. DRI Document 93-3305.3D2. Desert Research Institute, Reno, NV.
- Environmental Protection Agency, 1991. Guidance on the Application of Refined Dispersion Models for Air Toxic Releases. EPA-450/4-91-007. U.S. Environmental Protection Agency, Research Triangle Park, N.C. 27711
- Ermak, D.L., 1990. User's Manual for SLAB: An Atmospheric Dispersion Model for Denser-than-air Releases, UCRL-MA-105607. Work performed for U.S. Dept. of Energy by Lawrence Livermore National Laboratory, Livermore, CA.
- Evans, M.L. and H.A. Carroll, Handbook for Using Foams to Control Vapors from Hazardous Spills, EPA report 600/8-86/019, July 1986.
- Fleischer, M.T. 1983. SPILLS: An Evaporation/Air Dispersion Model for Chemical Spills on Land. Available as NTIS/DF-83/001 (Accession Number PB83-109470). Shell Development Co., Houston, TX.
- Gillespie, P.J. and L.R. DiMaio, How Foam Can Protect HPI Plants, Fire Protection Manual for Hydrocarbon Process Plants. Volume 2, Houston, 1981.
- Griffiths, R.F. 1994. Errors in the Use of the Briggs Parameterization for Atmospheric Dispersion Coefficients. Atmospheric Environment 28(17) 2861-2865. Elsevier Science Ltd. (Great Britain).
- Gross, S.S. and R.H. Hiltz, Evaluation of Foams for Mitigating Air Pollution from Hazardous Spills, EPA Report 600/2-82-029, March 1982.
- Hanna, S.R., D.G. Strimaitis, and J.C. Chang. 1991. Hazard Response Modeling Uncertainty: A Quantitative Method. (Vols I and II). Prepared for Tyndall Air Force Base by Sigma Research Corporation, Concord, MA. Procurement Instrument Identification Number FO8635-89-C-0136.

Havens, J. 1988. A Dispersion Model for Elevated Dense Gas Jet Chemical Releases -- Vol. I. EPA 450/4-88-006 (Accession No. PB88-202387). U.S. EPA, Research Triangle Park, NC.

Havens, J., Review of Dense Gas Dispersion Experiments, International Workshop on Hazard Assessment and Disaster Mitigation in Petroleum and Chemical Process Industries, in Madras, India. Journal of Loss Prevention, Process Industries, 1992, Vol 5, No 1.

Havens, J.A, Evaluation of 3-D Hydrodynamic Computer Models for Prediction of LNG Vapor Dispersion in the Atmosphere, Gas Research Institute, Chicago. Contract No. 5083-252-0788, Annual Report, March 1984 - February 1985.

Hiltz, R.H., The Potential of Aqueous Foams to Mitigate the Vapor Hazard from Released Volatile Chemicals, International Symposium on Preventing Major Chemical Accidents, American Institute of Chemical Engineers, New York, February 1978.

Irwin, H.P.A.H., 1981. The Design of Spires for Wind Simulation. Journal of Wind Engineering and Industrial Aerodynamics, 7(1981) 361-366. Elsevier Scientific Publishing Co, Amsterdam (The Netherlands).

Jones, S.J. and D.M. Webber. 1993. Advances in Gas Cloud Modeling: The Interaction of a Dense Gas Plume with a Fence. Trans IChemE 71(B) Feb. 1993 (Great Britain) Presented at IBC Conference, London, Nov. 1992.

Joseph, D., et al., Evaluation of the Efficiency of Industrial Flares: Background-Experimental Design-Facility, EPA-600/2-83-070 (NTIS PB83263723), August 1983.

Kent, G.R., Practical Design of Flare Stacks, Hydrocarbon Processing and Petroleum Refiner, August 1964.

Leone, F. A . 1991, Hazardous Material Testing Facility, Liquefied Gaseous Fuels Spill Test Facility (LGFSTF) Program, Office of Fossil Energy, United States Department of Energy, Washington D. C.

McNaughton, D.J., G.G. Worley, and P.M. Bodner, Evaluating Emergency Response Models for the Chemical Industry, Chemical Engineering Progress, January 1987.

- McNaughton, D.J., A.A. Marshall, P.M. Bodner, and G.G. Worley, Evaluation and Assessment of Models for Emergency Response Planning, prepared for Chemical Manufacturing Association by TRC Environmental Consultants, Inc., 1986.
- Miller, C.F., F.A. Leone, and W. Bryan, Liquefied Gaseous Fuels Spill Test Facility: Site Evaluation Study, Lawrence Livermore National Laboratory, Berkley, CA, February 1985.
- Perry, R.H. and C.H. Chilton. 1973. Chemical Engineers' Handbook. 5th edition McGraw-Hill Book Co., N.Y., N.Y.
- Peterson, R.L., and B.C. Cochran. 1995. Wind Tunnel Determination of Equivalent Refinery Roughness Patterns, unpublished report for Western Research Institute by Cermak Peterka Peterson Inc., Fort Collins, CO.
- Pohl, J.H. and N.R. Soelberg, Evaluation of the Efficiency of Industrial Flares: Flare Head Design and Gas Composition, EPA-600/2-85-106 (NTIS PB86100559), September 1985.
- Post, L. 1994 (draft). HGSTSTEM User's Manual, Shell Research Limited, Thornton Research Centre, Chester, U.K.
- Post, L., 1994 (draft). HGSYSTEM Technical Reference Manual, Shell Research Limited, Thornton Research Centre, Chester, U.K.
- Puttock, J.S., G.W. Colenbrander, and H.W.M. Witlox., 1988. User's Guide for HEGADAS* Heavy Gas Dispersion Program. Available as EPA document EPA/SW/DK-89/027a (Accession No. PB89-164560). Shell Research Limited, Thornton Research Centre, Chester, U.K.
- Reynolds, R.M., 1992 (draft). ALOHATM (Areal Locations of Hazardous Atmospheres) 5.0 Theoretical Description. NOS ORCA-65. National Oceanic and Atmospheric Administration, Seattle, WA.
- Ridner, R.N. and S. Wachtell, "Establishment of Design Criteria for Safe Processing of Hazardous Materials," in Loss Prevention, Volume 7. AIChE, New York, 1973.
- Roberts, P.T. and D.J. Hull. 1994. Wind-tunnel Simulation: Boundary Layer (Z_0) Effects in Dense Gas Dispersion Experiments. J. Loss Prev. Process Ind. 7(2) 106-117. Butterworth-Heinemann Ltd. (Great Britain).

RPC, Inc., Siting Industrial Facilities on the Texas Coast, Texas Coastal Management Program, Texas General Land Office, Austin, Texas, September 15, 1978.

Shrivastava, Paul, "The Accident at Union Carbide Plant in Bhopal: A Case Study in Avoiding and Managing Environmental Damage from Major Industrial Accidents," Air Pollution and Control Association Conference, Vancouver, Canada, November 1985.

Spicer, T. 1990. Implementation of DEGADIS v2.1 on a Personal Computer. Report prepared for American Petroleum Institute by author, Fayetteville, AR.

Tan, S.H., Simplified Flare System Sizing, Hydrocarbon Processing, October 1967.

Touma, J.S., 1991. Guidance on the Application of Refined Dispersion Models for Air Toxics Releases, EPA-450/4-91-007, Office of Air Quality Planning and Standards, U.S. EPA, Research Triangle Park, NC.

Van Olden, A.P., On the Spreading of a Heavy Gas Released Near the Ground, 1st International Loss Symposium, The Hague, Netherlands, 1974.

Van Olden, A.P., A New Bulk Model for Dense Gas Dispersion: Two-Dimensional Spread in Still Air, I.U.T.A.M. Symposium on Atmospheric Dispersion of Heavy Gases and Small Particles. Delft University of Technology. The Netherlands, 1983.

Wighus, R., Simulation of Propane Dispersion from Spills in a Petrochemical Plant Using a Water Tunnel Technique, 4th International Symposium on Loss Prevention and Safety Promotion in the Process Industries, The Institution of Chemical Engineers, Symposium Series No. 80, London, England, 1983.

Zannetti, P. 1990. Air Pollution Modeling (book) Van Nostrand Reinhold, N.Y., N.Y.

DUPCHECK-ID-NUMBER: 96001558140

PERMANENT-DOCUMENT-NUMBER: M96000634 000

<013> DATE-COMPLETED 960410
<014> DATE-OF-RECORD-ENTRY 960320
<015> DATE-RECEIVED 960320
<016> COPIES-RECEIVED 2
<020> DOCUMENT-TYPE R
<022> MEDIUM-CODE H
<030> CLASSIFICATION-CODE Uncl
<050> GPO-SUPERINTENDENT-OF-DOCUMENTS Y
<080> SPONSORING-ORGANIZATION-CODE DOE/FE
<110> TITLE-ENGLISH

Development of a national spill test facility data base. Topical report, February 1994--February 1995

<150> PRIMARY-REPORT-NUMBER DOE/MC/30126--5103
<240> CONTRACT-NUMBER-DOE FC21-93MC30126
<241> ABBREV-CONTRACT-NUMBER-DOE MC30126
<242> AWARDING-OFFICE-CODE 21
<243> BUDGET-REPORTING-CODE AA6510000/AA6525000
<245> LEGIBILITY-CODE 0
<246> DOE-INITIATING-OFFICE-CODE MC
<247> MICROFICHE-DISTRIBUTION-CODE 4
<248> VENDOR-ID-CODE 109420-0001-3
<249> VENDOR-NAME WESTERN RESEARCH INSTITUTE
<251> REPORTING-REQUIREMENT AK
<276> DUPCHECK-BYPASS-FLAG N
<291> PACKED-PRIMARY-REPORT-NUMBER DOEMC301265103
<293> PREFIX DE
<295> INDEX-DOCUMENT-NUMBER M96000634
<370> PUBLICATION-DATE Feb 1995
<376> REPORT-TYPE-CODE-AND-FREQUENCY T/02/95
<390> PAGES-BIBLIOGRAPHIC 26
<400> REPORT-DISTRIBUTION-CODE A
<421> LANGUAGE-CODE EN
<425> AUDIENCE-CODE 01
<426> LIMITATION-CODE UNL
<510> DISTRIBUTION-CATEGORY M -107
<520> PROJECT-STATUS P
<530> ANNOUNCEMENT-CODE EDB;ERA;ETD;NTS
<540> EDB-SUBJECT-CATEGORIES 020900;290300;030800;990301
<550> SOURCE-OF-BIBLIOGRAPHIC-INPUT TIC
<560> COUNTRY-OF-INTELLECTUAL-ORIGIN US
<570> COUNTRY-OF-PUBLICATION US
<686> DOCUMENT-STATUS-CODE 000
<700> CORPORATE-CODE 9517820
<801> SUBJECT-DESCRIPTORS

HAZARDOUS MATERIALS SPILLS:T1;TEST FACILITIES:Q1,Q2;DATA BASE MANAGEMENT:Q1,Q2;CHEMICAL SPILLS:T2;US DOE;US EPA;REGULATIONS;CLEAN AIR ACTS

<931> AVAILABILITY-CODE OS;NT
<950> ABSTRACT

In the United States, the production of gas, liquid and solid fuels and the associated chemical use accounts for significant volumes of material with the potential of becoming hazardous. Accidental spills or releases of these hazardous materials do occur, and action must be taken to minimize damage to life, property, and the environment. Because of the hazards of testing with chemical spills, a national spill test facility (STF) and an associated testing program have been established to systematically develop new data on the effects and mitigation of hazardous chemical spills Western Research Institute (WRI), in conjunction with the DOE, is developing a comprehensive national spill test data base. The data base will be easily accessible by industry and the public on the Spill Research Bulletin Board System and will allow users to download spill test data and test descriptions, as well as an extensive bibliography. The 1990 Clean Air Act and Amendments (CAAA) requires that at least two chemicals be field tested at the STF and at least 10 chemicals be studied each year. The chemicals to be studied are chosen with priority given to those that present the greatest risk to human health. The National Spill Test Facility Data Base will include a common chemical data base covering the overlap of federal chemical lists and significant information from other sources. Also, the (CAAA) directs the DOE and EPA to work together with the STF and industry to provide a scientific and engineering basis for writing regulations for implementation of the (CAAA). The data base will be a primary resource in this effort.