THE INFORMATION DATA BASES AT THE TRANSPORTATION TECHNOLOGY CENTER[a]

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The Transportation Technology Center (TTC) at Sandia National Laboratories is a component of the Department of Energy's Nuclear Waste Management Program. The center provides technical management and support for those programs related to the transportation of nuclear materials.

A very important support function is the ability to provide information upon request. The TTC must respond to information requests concerning the transportation of nuclear material coming from many diverse areas (e.g., federal and state governmental bodies and agencies; research institutions; private companies; organizations; and private individuals). Information must be provided to support the other functions of the Transportation Technology Center. The information must be accurate, current and adequate and must be accessible in a timely mode.

When the TTC was established in 1978, it was recognized that although considerable information about transportation of nuclear materials existed it was scattered among many governmental agencies or report holdings. Information searches were time consuming, expensive and often incomplete.

In 1979 a special collections library was established in the TTC and work was started on several of the information data bases.

Today the TTC has six information collections in computerized data bases.

They are:

Nuclear Material Transportation Incidents
Radioactive Materials Packaging
Legislative and Regulatory Information System
Research in Progress
Bibliographic Collection
Transportation Technical Environmental Information

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THE NUCLEAR MATERIALS TRANSPORTATION INCIDENT DATA BASE

The Nuclear Materials Transportation Incident Data Base is a comprehensive collection of reports on incidents* occurring during the transportation of nuclear materials. The data base was started in mid 1979 using an existing collection of Hazardous Materials Incident Reports (HMIR) from the Department of Transportation. Now included are reports from the Nuclear Regulatory Commission, the Department of Energy, as well as from various state agencies and other sources. The time period covered is 1971, the start of the HMIR system, to the present. The data base contains 794 entries (January 1982) for radioactive material compared to 122,354 entries for all hazardous materials in DOT's Hazardous Materials Incident Report System.

The rationale for creating a specialized data base for a comparatively small number of reports is that of providing a complete and accurate history of incidents which occur during the transportation of all radioactive materials moving in commerce while also allowing for quick response to specific questions. The information gathering extends beyond those incidents required by regulation to be reported to the Department of Transportation: included are those in which there was no release or suspicion of release of material but were considered to be newsworthy by the media or others.

Primary information sources for the data base are Hazardous Materials Incident Reports for radioactive material from DOT and Preliminary Notification of Occurrence Reports from the Nuclear Regulatory Commission. Copies of these reports are sent to the TTC on a routine basis. Files of the Emergency Operations Center at the Department of Energy are checked periodically for transportation related reports. Additional reports are obtained from state radiological health or response departments, generally upon specific request. Two clipping services provide newspaper articles on transportation incidents or accidents where radioactive material is involved. Telephone query is also used to track down information on incidents. The HMIR serves as the primary report where it exists. The other reports then provide additional information on the incident.

Information on the incident reports is prepared for entry into the data base. The hard copies are then filed in chronological order to facilitate retrieval. Each entry in the data base contains up to 33 elements, 26 of which can be used as search keys. The searchable (key) elements are:

Report number
Carrier, shipper and consignee and their address zip codes
Incident location zip code
Urban or rural

*See Appendix A for definition.

Date and time
Transportation mode
Vehicle or facility type
Losses due to release of material, i.e., injuries, deaths, cost
Quantity released
Vehicle accident,* handling accident* or no accident
Material shipping name and type, i.e., LLW, etc.
Failure mode
Package kind, DOT Spec. or NRC certificate number and type
Transportation link or facility denial
Special search key.

Information elements include:

Location description
Material trade name
Material classification, i.e., radioactive materials
Package unit volume or weight
Number shipped
Number failed
General remarks.

Not all the information for the data elements will be present on the reports received at TTC. The HMIR form DOT F 5800 does not contain blanks for all of the above data elements and in many cases existing blanks are not filled. Reports from the NRC are free format text and may not provide all of the information required. Some information can be deduced from the body of the reports, but frequently phone calls to the carrier's representative, to the NRC Inspection and Enforcement representative or to the State's Radiological Response Team are made in an attempt to obtain complete information on the incident.

TTC has provided information from the data base to a broad range of requestors, including state and federal government agencies; state and federal legislative staffs and advisors; corporations, private individuals, organizations and media representatives. The information is also used by the TTC staff for environmental impact studies, risk assessment and other studies. Many referrals are directed to TTC by DOT and NRC who are also frequent requestors.

The data as it exists is the most complete holding available for providing information on US incidents occurring during the transportation of radioactive material. It is a detailed subset of information principally obtained from the much larger Hazardous Materials Incident Report System. Specific requests for information are honored from anyone.

*See Appendix A for definition.

RADIOACTIVE MATERIALS PACKAGING DATA BASE

One of the problems in the shipping of radioactive materials is determining which of existing packages may have potential use for the application at hand. A search of the packaging data base may produce one of three options: (1) there may be a perfect match between a radionuclide packaging requirement and a certificated package listed in the data base; (2) there may be an existing package that can be modified and recertified for use; and (3) there may be no certificated packaging available in the data base to transport the radionuclide. Presently, only packagings from the current NRC Directory (NUREG-0383) are in the data base, but eventually DOT spec. and DOE certified packagings will be included. If time permits, packaging no longer certified or in use will be incorporated to provide a historical reference.

Each package entry includes search keys for certificate or special permit number, model name, designer, package gross weight, external and internal cavity dimensions, authorized contents (radionuclide, form, thermal and curie limits), shielding, certificate dates, licensees, and other data. The data is keyed to allow for easy search of the information desired.

Once a potential package is identified for the application, one must contact the primary user or the Transportation Certification Branch, U.S. Nuclear Regulatory Commission, for steps that must be taken to obtain a certificate of compliance.

LEGISLATIVE AND REGULATORY INFORMATION SYSTEM

The transportation of radioactive materials is controlled by numerous legislative and regulatory actions at the federal, state and local levels. The most common actions are the establishment of special agencies to regulate the transportation of radioactive materials, prenotification, requirements for special permits and/or escorts, and the banning of shipments in a jurisdiction or on certain roadways. Shippers, carriers, and management or planning personnel of companies involved in the use of radioactive materials need to know of these regulatory or legislative actions.

To provide this information, the TTC supports the Legislative and Regulatory Information System at the Hazardous Materials Information Center, Oak Ridge National Laboratory. The "Legislative" data base contains state, local, and federal level legislation and regulatory actions pertaining to the shipment of radioactive materials throughout the U.S. Other hazardous materials are also covered. The data base also contains similar information in the areas of disposal, storage and management of radioactive materials, moratoriums on power plant construction, siting, radiation and control studies and remedial actions (e.g., decommissioning of nuclear facilities, uranium mill tailings, and cleanup of contaminated land).

The collected regulatory material is abstracted, indexed, and input into one of the two data bases that were developed under this system. These data bases are separated according to the status level of the legislation, that is, current vs. historical legislation. The CURRENT LEGISLATION DATA BASE includes all legislative actions introduced and acted upon (adopted into law or denied) during the current calendar year or those bills carried over from the previous year's sessions. The HISTORICAL LEGISLATION DATA BASE consists of all legislative actions for previous years that have become public laws, as well as those that were unsuccessful and classified as having died or failed in the legislative process.

The information is grouped into 13 subject categories. Transportation restrictions are covered by: escort, notification, permit, prohibition, and weight. Other legislative information is covered by the subject areas: agency, disposal and storage, emergency, legal aspects (i.e., legal and financial responsibilities), legislative contact, power, regulations, and remedial actions.

The legislative information categories include legislative identification numbers, key provisions of the bills, agencies involved in the writing of regulations and their enforcement, and an abstract of the legislation.

RESEARCH IN PROGRESS

The Research in Progress Data Base was created to aid in maintaining an awareness of the ongoing research in the field of transportation of radioactive material.

The data base receives input concerning current research in the U.S as well as research projects completed in the past year. The projects include many phases of RAM transportation involving such areas as: packaging, risk analysis, disposal and institutional issues.

Approximately 100 research projects are listed in the data base. While this number is by no means complete, it does represent an overview of current research activity. The information was obtained by phone and mail survey, and by accessing several other research related data bases.

Some 25 elements are included in each entry including project title, performing agency, research status, investigator, subcontractor, funding agency and keywords.

There will be a once-a-year effort to update the data base by contacting those who contributed in the past and utilizing new sources.

BIBLIOGRAPHY COLLECTION

The Bibliographic Data Base is a file of bibliographic

descriptions of reports, books, conferences, and journal articles in the field of transportation of radioactive materials. Presently, it lists relevant titles from the Energy Data Base of DOE/RECON at the Technical Information Center, Oak Ridge, TN.

Categories of information in the Bibliographic Data Base include:

- Transport of nuclear (radioactive) materials systems and interfaces, national and international
- Shipping containers
- Laws, regulations, and licensing affecting the transportation of nuclear materials
- Transportation accident analysis
- Emergency response
- Statistics
- Risk assessments
- Safety analysis
- Environmental aspects
- Economic, political, and social aspects
- Seabed disposal

The file can be searched by subject, title, author, report number, key word, etc. Abstracts of the documents, where available, are on microfilm rather than in the computer file.

To support inhouse literature searches, the facilities of Sandia Technical Library are used also.

TTC also has a specialized library collection for its own staff's member use.

TRANSPORTATION TECHNICAL ENVIRONMENTAL INFORMATION

The Transportation Technical Environmental Information Center at Sandia is funded by the TTC. Its formation predates that of the Transportation Technology Center by many years. A large amount of information concerning the physical parameters of air, truck, rail, and water shipment of cargos have been collected and indexed. Currently, there are over 28,000 pages of data on the physical parameters of the various transportation modes. Included is data on shock, vibration, acceleration, thermal cycles, etc. The information is stored on aperture cards or microfiche. The collection of information is a continuing process. The data is used in transportation related studies, design analysis and risk assessments. A short (7-1/2 minute) movie titled "Transportation Environment Information Center" describes this activity and is available on request.

Requests for information relative to the transportation of radioactive materials will be honored. Appendix B lists the contacts for the various data collections.

APPENDIX A

Radioactive Material Transportation Incident

An incident is an event occurring during the course of transportation (including loading, transport, unloading and temporary storage) of radioactive materials which results in actual or suspected release of radioactive material. An event also includes: fire, breakage, excessive radiation or suspected radiation leakage, loss of possession or accident conditions whether or not there is any actual or suspected release of contents.

This definition is not limited to incidents required by DOT regulations to be reported to the Hazardous Materials Incident Report (HMIR) System (49 CFR 171.16-16, 174.750, 175.45(a)(4), 176.48(a) and 177.86(a).

Radioactive Material Transportation Accident

A radioactive material transportation accident is an incident in which the conveyance transporting a radioactive material package is involved in an accident. Accidents are subsets of incidents (see definition) and include a wide range of severities ranging from minor mishaps to the very severe.

This definition is not limited by financial costs, injuries or fatalities.

Handling Accident

A handling accident is an incident in which damage to a shipping container due to handling operations is encountered. Examples are a package dropped in handling, run over by handling or transportation type vehicles or punctured by a forklift.

APPENDIX B

For further information or specific questions contact:

Nuclear Materials Transportation Incidents

Eugene L. Emerson
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(505) 844-4301 or FTS 844-4301

Radioactive Materials Packaging

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(505) 844-4301 or FTS 844-4301

Legislative and Regulatory Information System

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(505) 844-1740 or FTS 844-1740

C. S. Fore
Oak Ridge National Laboratory
P.O. Box X
Oak Ridge, Tennessee 37830

(615) 574-7769 or FTS 624-7769

Bibliographic Collection

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Research in Progress

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