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EPA

CEPPO

CHEMICAL SAFETY ALERT

Use Multiple Data Sources for Safer Emergency Response

The Environmental Protection Agency (EPA) is issuing this Alert as part of its ongoing effort to protect human health and the environment by preventing chemical accidents. EPA is striving to learn the causes and contributing factors associated with chemical accidents and to prevent their recurrence. Major chemical accidents cannot be prevented solely through command and control regulatory requirements. Rather, understanding the fundamental root causes, widely disseminating the lessons learned, and integrating these lessons learned into safe operations is also required. EPA publishes *Alerts* to increase awareness of possible hazards. It is important that facilities, SERCs, LEPCs, emergency responders and others review this information and take appropriate steps to minimize risk.

PROBLEM

A critical consideration when choosing a response strategy is the safety of emergency responders. Adequate information about on-site chemicals can make a big difference when choosing a safe response strategy. This information must include: name, toxicity, physical and chemical characteristics, fire and reactivity hazards, emergency response procedures, spill control, and protective equipment.

Generally, responders rely primarily on Material Safety Data Sheets (MSDSs) maintained at the facility. However, MSDSs may not provide sufficient information to effectively and safely respond to accidental releases. This *Alert* is designed to increase awareness of MSDS limitations, so that first responders can take proper precautions, and identify additional sources of chemical information, which could help prevent death or injury.

ACCIDENTS

In May 1997, a massive explosion and fire occurred at an agricultural chemical packaging facility in eastern Arkansas. Prior to the explosion, employees observed smoke in a back warehouse and evacuated. The facility called local responders and asked for help to control smoldering inside a pesticide container. The local fire department rapidly responded and reviewed the smoldering product's MSDS. The MSDS lacked information on decomposition temperatures or explosion hazards. The firefighters decided to investigate the building. While they were approaching, a violent explosion occurred. Fragments from a collapsing cinder block wall killed three fire fighters and seriously injured a fourth.

In April 1995, an explosion and fire at a manufacturing facility in Lodi, New Jersey caused the death of five responders. The explosion occurred while the company was blending aluminum powder, sodium hydrosulfite, and other ingredients. Even though the material was water reactive, the MSDS for the product advised the use of a "water spray... to extinguish fire." The recommendation in the MSDS for "small fires" was to flood with water; however, "small fire" was not defined, the amount of water necessary was not specified, and no information dealt with how to respond to large fires (which can occur during blending processes).

The MSDS ONLY described the hazards associated with the product. In this case, responders needed information on the hazards associated with the reactivity during the blending process (which was significantly different from the product).

Emergency responders should note that the chemical information provided on an MSDS usually presents the hazards associated with that particular product. Once the product is placed in a process some factors may change, resulting in the increase/decrease, or elimination of hazards. These factors may include reactions with other chemicals and changes in temperature, pressure, and physical/chemical characteristics.

MSDSs in the WORKPLACE

In 1988, the Occupational Safety and Health Administration (OSHA) required facilities storing or using hazardous chemicals to comply with the Hazard Communication Standard. This standard requires employers to provide employees with an MSDS for every hazardous chemical present onsite, and to train those employees to properly recognize the hazards of the chemicals and to handle them safely.

MSDSs normally provide information on the physical/chemical characteristics and first aid procedures. This information is valuable for employees to safely work with the chemical. However, the content for MSDSs on emergency response procedures, fire, and reactive hazards may be insufficient for local responder use in an emergency situation. Vagueness, technical jargon, understandability, product vs. process concerns, and missing information on an MSDS may increase the risk to emergency responders.

OSHA requires that MSDSs include:

- Chemical identity (product by chemical and common names);
- Chemical and common names of all hazardous ingredients;
- Physical and chemical characteristics (such as vapor pressure, flash, boiling or freezing points);
- Fire and explosion hazards;
- Reactivity hazards (how will the chemical react with other chemicals, air, or water);
- Health hazards (acute and chronic, symptoms of exposure);
- Precautions for safe handling; and
- Control measures.

The MSDS also must include the name and telephone number of the individual who can provide additional information on appropriate emergency procedures.

MSDSs are provided by manufacturers, importers and/or distributors. MSDS chemical hazard information can vary substantially depending on the provider. Sometimes this discrepancy is due to different testing procedures. However, whoever prepared the MSDS is responsible for assuring the accuracy of the hazard information. The following chart summarizes information from various MSDSs for the chemical *azinphos methyl* and it illustrates how different sources can provide varied and conflicting information. Information from the Computer-Aided Management of Emergency Operations (CAMEO) Response Information Data Sheets (RIDS)[1] also is provided.

1 CAMEO RIDS is developed by the National Oceanic and Atmospheric Administration and EPA. RIDS contains a database of over 4,000 hazardous chemicals, 50,000 synonyms, and product trade names, linked to chemical-specific information on fire, explosive and health hazards, firefighting techniques, cleanup procedures, and protective clothing.

Comparison of MSDS Data for Azinphos Methyl - AZM (CAS NO. 86-50-0)					
	MSDS – A	**MSDS – B**	**MSDS - C**	**MSDS - D**	**CAMEO RIDS**
Hazard ratings	Health - 2 Flammability - 0 Reactivity - 0	None listed	Health - 3 Fire - 2 Reactivity - 2	Health - 4 Flammability - 0 Reactivity - 0	Health - 3 (extremely hazardous) Fire - 2 (ignites when moderately heated) Reactivity - 2 (violent chemical change possible)
Reactivity Hazards	Stable under normal conditions Hazardous polymerization will not occur	Depends on characteristics of dust; decomposes under influence of acids and bases	Stable material. Unstable above 100 °F sustained temperature. Hazardous polymerization will not occur	Releases toxic, corrosive, flammable or explosive gases Polymerization will not occur	Will decompose
Incompatibility	High temperatures, oxidizers, alkaline substances	Acids and bases	Heat, moisture	Heat, flames, sparks, and other ignition sources	Heat, UV light
Fire Hazards	Vapors from fire are hazardous	Combustible. Gives off irritating or toxic fumes (or gases) in a fire	Decomposes above 130 ° F with gas evolution and dense smoke. Dust explosion hazard for large dust cloud	Containers may rupture or explode if exposed to heat	Decomposes giving off ammonia, hydrogen and CO

INFORMATION SOURCES FOR FIRST RESPONDERS

Many established fire department hazardous materials teams follow the "Rule of Three", which requires that three sources of information should be consulted before a response decision is made. Listed below are resources available to help first responders plan the Rule of Three. This is not a comprehensive list, but rather, a starting point.

o Chemical Inventories - **Chemical inventory records filed by the facilities in their jurisdiction under the Emergency Planning and Community Right-to-Know Act for basic hazard and storage information. -** It is a good practice to gather information from various sources on the hazards and proper response for those chemicals. This information can be used to enhance emergency response procedures between local officials and facilities. Newly required Risk Management Program (RMP) information provided by facilities will provide local responders with process and chemical hazards and facility-specific response information.

o Assistance From Others - Emergency personnel and local officials have several avenues to obtain additional information about chemical hazards and proper response options in an emergency. It is essential that local response and planning officials know what these resources are and how to obtain them quickly and effectively. One of the key elements is the ability of the responders to correctly interpret available data. Most are not chemists nor health professionals. Many of the resources listed below can help with these interpretations.

o Training - Local officials should ensure that all responders have sufficient training in hazardous materials response. The National Fire Protection Association (NFPA) 472 *Standard on Professional Competence of Responders to Hazardous Materials Incidents* specifies minimum competencies. State Fire Training Academies and State Emergency Management Offices can provide more information on training. This training will form a foundation to better understand chemical information.

o Pre-planning with facilities that store or use hazardous materials is critical to local officials and helps to identify specific concerns for each facility and opportunities to prepare effectively for those concerns, or to reduce existing risks.

Sufficient and correct information regarding chemicals in an accidental release may make the difference between a successful emergency response and a potential disaster for local responders and the community they are protecting.

ASSISTANCE FOR LOCAL EMERGENCY RESPONDERS			
Emergency Phone Numbers:			
National Response Center	(800)424-8802	Serves as the national point of contact for reporting of releases and spills; can quickly assist caller in reaching other response agencies, such as EPA Regional offices, U.S. Coast Guard, State response officials.	
EPA Regional Office 24-hour Emergency Numbers	Regions: I - 617/223/7265 II - 732/548-8730 III - 215/814-9016 IV - 404/562-8700 V - 312/353-2318 VI - 214/665-2222 VII - 913/281-0991 VIII - 303/293-1788 IX - 415/744-2000 X - 206/553-1263	 CT, ME, MA, NH, RI, VT NJ, NY, PR, VI DL, DC, MD, PA, VA, WV AL, FL, GA, KY, MS, NC, SC TN IL, IN, MI, MN, OH, WI AR, LA, NM, OK, TX IA, KS, MO, NE CO, MT, SD, UT, WY AZ, CA, HI, NV, GU, AS AK, ID, OR, WA	Responsible for receiving spill reports within each Region and determining whether a federal response to assist is necessary. Can provide assistance to local and state officials on proper response activities, oversight of responsible party in cleanup efforts, and that assure necessary resources are available.
State 24-hour Emergency Numbers	Call the NRC or Regional EPA number for specific state numbers	Can support and assist local agencies if an incident is beyond local capabilities.	
CHEMTREC	(800)424-9300	Public service of the chemical industry, can provide technical assistance on proper response; contacts manufacturer or shipper to link them with the incident scene; can facilitate communication between technical experts and the incident scene.	

Sources of Information		
CAMEO RIDS	http://www.nsc.org/ehc/cameo.htm (800) 621-7619	Developed by the National Oceanic and Atmospheric Administration (NOAA) and EPA, provides access to safety and emergency response information on more than 4,700 hazardous chemicals. Distributed by the National Safety Council.
Chemfinder Webserver	http://chemfinder.camsoft.com	A single master list of chemical compounds, which provides physical and chemical data, and then references other sources with additional information.
Chemical Health & Safety Data	http://ntp-server.niehs.nih.gov/main_pages/chem-hs.html	Health and safety information on over 2,000 chemicals studied by the National Toxicology Program.
Chemical Reactivity Worksheet **(New Product)**	http://response.restoration.noaa.gov/chemaids/react.html	Provides information on the reactivity of substances or mixtures of substances. It includes a database of over 4,000 chemicals and their special hazards.
Cornell University	http://msds.pdc.cornell.edu/issearch/msdssrch.htm	Electronic MSDSs from various manufacturers on over 325,000 chemicals.

DOT North American Emergency Response Guidebook	http://hazmat.dot.gov/psnsort.htm	A guide to aid first responders in (1) quickly identifying the material and (2) protecting themselves and the general public during an initial response. Over 5,000,000 copies of the guide have been provided to the local emergency response community.
EHS Chemical Profiles and Emergency First Aid Guides	http:www.epa.gov/swercepp/cheminf.html	Information on the 300+ Extremely Hazardous Substances in EPCRA, which includes physical/chemical properties, health hazards, fire and explosion hazards, reactivity data, and other response information.
Glossary of MSDS Terms	http://ecologia.nier.org/cgi-bin/msdsterm.pl	Includes 106 terms commonly found on an MSDS. Can also search for MSDSs for specific chemicals.
Hazardous Materials Guide	http://www.usfa.fema.gov/hazmat	Information on over 1,750 materials, providing response scenarios, identification of materials, glossary of terms, and other references to effectively respond to an incident.
HazDat Database	http://atsdr1.atsdr.cdc.gov:8080/hazdat.html	Developed by the Agency for Toxic Substances and Disease Registry, provides information on the release of hazardous substances and the effects on the health of human populations.
International Chemical Safety Cards	http://www.cdc.gov/niosh/ipcs/ipcscard.html	Concise and simple information on hazards on approximately 1,000 chemicals.
Medical Management Guidelines for Acute Chemical Exposures Patient Information (FAQs)	http://atsdr1.atsdr.cdc.gov:8080/mmg.html	Aid for emergency room physicians and other healthcare professionals who manage acute exposures from chemical incidents. Used to effectively decontaminate patients, communicate with other personnel, and provide competent medical evaluation and treatment.
NFPA	http://www.orcbs.msu.edu/chemical/nfpa/nfpa.html	Provides the NFPA chemical hazard labels system for indicating the health, flammability, and reactivity hazards of chemical.
NIOSH Pocket Guide	http://www.cdc.gov/niosh/npg/npg.html	Source of general industrial hygiene information on hundreds of chemicals including exposure limits, properties, incompatibilities and reactivities, respirator selections, symptoms of exposure, and emergency treatment.
Vermont SIRI	http://www.hazard.com	Electronic MSDSs from various manufacturers on approximately 200,000 chemicals
EPA/CEPPO	http:www.epa.gov/ceppo	Risk Management Programs/EPCRA information and contacts

Statutes and Regulations

The following are a list of some federal statutes and regulations related to emergency planning, release

reporting, and hazardous materials worker protection.

EPA

Emergency Planning and Community Right-to-Know

• Emergency Planning [40 CFR Part 355]- Facilities that have listed substances above a specified threshold quantity must report to their Local Emergency Planning Commission (LEPC) and State Emergency Response Commission (SERC) and comply with certain requirements for emergency planning.

• Emergency Release Notification [40 CFR Part 355]- Facilities that release listed chemicals over reportable quantities must immediately report the release to the LEPC and the SERC.

• Hazardous Chemical Reporting [40 CFR Part 370]- Facilities that have chemicals at or above threshold quantities must submit MSDSs to their LEPC, SERC, and local fire department and comply with the Tier I/ Tier II inventory reporting requirements.

• Toxic Release Inventory [40 CFR Part 372] - Manufacturing businesses with ten or more employees that manufacture, process, or otherwise use listed chemicals above an applicable threshold must file annually a Toxic Chemical Release form with EPA and the state.

Comprehensive Environmental Response, Compensation, and Liability Act

• Hazardous Substance Release Reporting [40CFR Part 302]- Facilities must report to the National Response Center any environmental release which exceeds reportable quantities. A release may trigger a response by EPA, or by one or more Federal or State emergency response authorities.

OSHA

Hazardous Waste Operations and Emergency Response Standard [29 CFR 1910.120]- Worker protection requirements for emergency response operations for release of, or substantial threats of release of, hazardous substances.

Process Safety Management Standard [29 CFR 1910]- Highly hazardous substance in quantities at or above a threshold quantity are subject to a number of requirements for management of hazards, including performing a process hazards analysis and maintaining mechanical integrity of equipment.

Hazard Communication [29 CFR 1910.1200]- Requires that the potential hazards of toxic and hazardous chemicals be evaluated and that employers transmit this information to their employees .

For additional information on OSHA standards contact OSHA Public Information at (202) 219- 8151.
Web site: http://www.osha.gov

For More Information.....

Contact the Emergency Planning and Community Right-to-Know Hotline

(800) 424-9346 or (703) 412-9810
TDD (800)553-7672

Monday -Friday, 9 AM to 6 PM, EASTERN STANDARD TIME

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