
# REGION 6 Preparedness, Response, and Prevention Update

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## Compilation of Pertinent Articles from 1988 - 2004 – Volume 6

EPA Region 6 LEPC Website: . . . . . www.epa.gov/region6/lepc

**Question/Answer - Reporting Requirements for Chemically Treated Wood under EPCRA 311 and 312**

*Until recently, OSHA exempted wood and wood products from the Hazard Communication Standard (HCS) program.*

*On February 9, 1994, OSHA amended its HCS to no longer exempt certain wood and wood products.*

*The revised exemption applies only to wood and wood products for which the hazard potential is limited to its flammability or combustibility.*

*Wood that has been chemically treated is now subject to the HCS and thus requires a facility to maintain an MSDS for the wood product.*

*In addition the wood product is potentially subject to EPCRA 311 and 312.*

*A manufacturer of creosote-treated wood stores various sizes of treated lumber, which it sells to retailers and wholesalers.*

*The facility never stores more than 10,000 pounds of creosote prior to being incorporated into the wood.*

*Would the consumer product exemption found apply to the creosote-treated wood?*

*If the treated wood in storage is subject to EPCRA 311 and 312, does the facility apply the total weight of the wood products toward the 10,000 pound threshold, or just the weight of creosote contained in the wood?*

EPCRA 311 and 312 apply to any facility that is required to prepare or have available a MSDS and has a hazardous chemical, as defined by OSHA, present in excess of 10,000 pounds, or has an extremely hazardous substance in excess of 500 pounds or the threshold planning quantity (TPQ), whichever is lower.

Despite the new applicability of OSHA's HCS to chemically treated wood, the wood may not be subject to EPCRA 311 and 312 if certain exemptions apply.

A manufacturer of creosote-treated wood would not have to count the wood products in storage towards the 10,000-pound threshold if the treated wood is in the same form and concentration as a product distributed to the general public.

If, however, the wood products are treated with levels of creosote not typically used in consumer products, then the wood products in storage must be counted in the threshold determination.

Likewise, any wood products in sizes not typically available to the general public must be counted towards threshold calculations.

A facility subject to the requirements of EPCRA 311 and 312 has two options for reporting mixtures.

An owner or operator for reporting mixtures.

An owner or operator may meet the requirements by either providing the required information on each component of a mixture or by providing the information on the mixture itself.

If the manufacturer of creosote-treated wood knows the concentration of the creosote in the wood, the manufacturer can apply the weight of creosote contained in the wood along with any other creosote on site towards the 10,000-pound threshold.

The owner or operator may prefer, however, to simply apply the total weight of the wood products towards the threshold.

The owner/operator may choose which reporting option to use, but the option chosen must be consistently applied for purposes under EPCRA 311 and 312.

## Applicability of EPCRA 311/312 to Horticultural Operations and Golf Courses

*EPCRA 311 and 312 require facility owners or operators to submit MSDS and annual inventory reports for any hazardous chemical subject to OSHA's Hazard Communication Standard when present at a facility above threshold amounts.*

*Under EPCRA 311(e)(5), any substance used in routine agricultural operations is exempt from EPCRA 311/312 reporting requirements.*

*Is the growing of turf by a nursery considered routine agricultural operations?*

*Does this exemption apply if the turf is grown and maintained by a golf course?*

The agricultural exemption found at EPCRA 311(e)(5) excludes fertilizers held for sale by retailers and any substance which is used in routine agricultural operations.

Agricultural operations is a broad term which EPA has interpreted to apply to various types of facilities, including nurseries and other horticultural operations.

Therefore, chemicals used in direct support of turf growing by a nursery are exempt under EPCRA 311(e)(5).

In contrast, a golf course is not an agricultural operation.

Golf courses derive their income from the playing of golf, not the sale of turf or other horticultural products.

Therefore, all hazardous chemicals (e.g., pesticides, fuel for equipment) onsite must be reported under EPCRA 311/312 if they exceed applicable thresholds.

## New OSHA Regulations Designed to Reduce Impact of Biohazards at MCI Sites

Emergency response personnel from Dallas and Tarrant Counties in North Central Texas were briefed on new regulations requiring the use of personal protective clothing by persons handling human remains at transportation/mass casualty accident sites.

Deputy Director Matthew Ellis, of the regional office of the National Transportation Safety Board, discussed the latest changes to the Occupational Safety and Health Administrations regulations with approximately 60 representatives from fire suppression, emergency medical service, law enforcement, and heath care fields at a seminar conducted on May 22, 1995, at the Dallas Naval Air Station.

As a result of federal legislation, the NTSB will now have the responsibility and authority to insure that anyone assisting in the recovery of human remains at a mass casualty accident site observes certain protocols involving the use and disposal of personal protective wear and equipment.

The NTSB offered some recommendations for communities to consider and, as appropriate, include in any MCI plan revisions they may anticipate making. Included among these guidelines were the following:

- A 'biohazardous area' should be declared any time an accident involves human remains.

  Local first responders should develop the capacity to identify and declare biohazardous or contaminated areas whenever known or suspected, as they will be the individuals first on the scene of a transportation/mass casualty incident.

- Rescues should be made as quickly as possible - and then response personnel should be withdrawn, and the site secured. Human remains to be recovered should not be moved (except as necessary for rescue) until NTSB investigators have issued instructions, and have been handled command of the incident.

- Ensure that your plan includes provisions for dealing with the media. The plan should include (1) physical arrangements for handling media at the accident site, and (2) management arrangements that provide for regular and timely press briefings by the NTSB.

- Post BIOHAZARD signs as soon as the [potentially] contaminated area is defined.

- Reduce the number of persons at the accident site. Once rescues have been made, the number of persons needed at the site should be substantially fewer.

- Protective clothing to be worn during recovery operations will have to be discarded (and new protective clothing put on) each time a worker leaves and reenters a biohazard site.

- Protective wear and equipment will include the following:

  - Disposable latex gloves.

  - Heavy work gloves.

  - Fluid-resistant face mask.

  - Protective goggles.

  - Disposable liquid-resistant coverall.

  - Disposable shoe covers/protective boots.

- Decontamination chemicals (currently approved are rubbing alcohol - 70%, and a mixture of bleach and water - 1 part bleach/10 parts water).

- Biohazard disposal bags.

- All materials used at or taken from the biohazard site must be decontaminated, labeled, and properly disposed.

  Determine in advance where and how items and/or containers removed must be labeled and handled.

- All persons who are exposed to contaminants [via skin openings or mucous membranes] at biohazard sites must have that exposure entered into their medical records.

An additional change in the regulations mandates that the NTSB will now investigate all aircraft accidents - including accidents involving 'public use' aircraft - with the following exceptions:

- Military aircraft, and

- Law enforcement aircraft invoked in intelligence-gathering

...unless those aircraft are invoked in a midair collision with a civilian aircraft.

## ATSDR Series Helps Health Care Professionals Deal with Hazmat Emergencies

The Agency for Toxic Substances and Disease Registry (ATSDR) is an agency of the Public Health Service in the U.S. Department of Health and Human Services (DHHS).

ATSDR was created by the U.S. Congress through the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA).

The Agency's responsibilities were markedly increased through the Superfund Amendments and Reauthorization Act of 1986 (SARA).

The mission of the Agency for Toxic Substances and Disease Registry is to present exposure and adverse human health effects and diminished quality of life associated with exposure to hazardous substances from waste sites, unplanned releases, and other sources of pollution present in the environment.

In pursuit of this mission, ATSDR provides education and referral resources to health care providers who are responsible for chemically exposed patients.

The Agency for Toxic Substances and Disease Registry (ATSDR) has produced a three-volume series entitled Managing Hazardous Materials Incidents.

The series is designed to assist emergency response and health care professionals plan for and respond to hazardous material emergencies.

Volume 1 - *Emergency Medical Systems: A Planning Guide for the Management of Contaminated Patients*.

Emergency medical services (EMS) must protect their personnel on-site and en route to the hospital, and other people within the hospital, while providing the best care for the chemically contaminated patient.

This document is designed for use by emergency medical technicians and other prehospital care providers to minimize their risks of exposure during the prehospital treatment and to provide for the safe and effective treatment of chemically contaminated patients.

Volume II - *Hospital Emergency Departments: A Planning Guide for the Management of Contaminated Patients.*

Hospital emergency departments must protect their personnel and other people within the hospital, while providing the best care for the chemically contaminated patient.

This document is designed for use by emergency department personnel to minimize their risks of exposure within the emergency department and to provide for the safe and effective treatment of chemically contaminated patients.

Volumes I and II are planning guides intended to help each EMS Group plan for incidents that involve hazardous materials and improve their ability to respond to these incidents appropriately.

Volume III - *Medical Management Guidelines for Acute Chemical Exposures.*

Medical Management Guidelines (MMGs) are guidelines that provide health care professionals with medical information for managing cases of acute exposure to hazardous substances.

This Volume is targeted for health care personnel requiring emergency medical treatment information.

It can be utilized by emergency room physicians, poison control centers, emergency responders, occupational health clinics, county health officials, the military services, and other health professionals who respond to acute exposure incidents involving hazardous chemicals.

The MMGs provide information on twenty-seven chemicals.

It includes description of the chemical, technical symptoms, chronic exposure information, prehospital care, hospital care, and patient information with follow-up instructions.

This document also contains generic procedures on the management of unknown exposures, triage, decontamination, transport, and protective clothing important for effectively handling medical emergencies.

A reference section offers information resources and a glossary.

Volume III is a guide for health care professionals who treat persons who have been exposed to hazardous materials.

## Hazardous Substances Database Is Important Training Tool

Fewer emergencies, injuries, and deaths involving hazardous substances are expected to occur in the future thanks to lessons learned through a database tracking these events.

The Hazardous Substances Emergency Events Surveillance (HSEES) database was started in 1990 by the Agency for Toxic Substances and Disease Registry (ATSDR) to track the consequences of hazardous substances emergencies on public health.

Such emergencies include those that take place during transportation or at fixed facilities such as manufacturing plants.

Hazardous substances, such as volatile organic compounds or acids, are those that will or may reasonably be anticipated to cause injury or death under certain circumstances.

In 1993 alone, a total of 3,946 hazardous substances emergencies were reported to the HSEES system by the 11 participating States. These incidents resulted in injuries to 2,269 people and 16 deaths, according to the 1993 HSEES annual report.

ATSDR and State health departments are now using information from the HSEES database to educate emergency responders and others about where, when, and how hazardous substances emergencies are likely to occur.

This knowledge could help prevent future emergencies and decrease the number of injuries and deaths if incidents do occur. In essence, the database provides people with information about risk factors contributing to these events.

"The ultimate goal of HSEES is to find out what the risk factors are that make these emergency events more likely to happen," said V. Ramana Dhara, MD, an ATSDR health officer.

"We also need to train physicians and emergency responders to look out and be prepared for the health effects of these chemicals.

ATSDR and State health departments share information from the HSEES database with SERCs, firefighters, hazardous materials (HAZMAT) teams, emergency medical personnel, physicians, and industries.

States have reported to ATSDR that they are using the information to improve training and emergency response procedures, and to improve enforcement of state and federal regulations and codes for production, storage, transportation, and use of hazardous substances, according to the 1993 HSEES annual report.

ATSDR is also currently developing a pamphlet based on HSEES information for LEPCs.

The information will help the committees prepare for what might happen in a hazardous substances release.

HSEES is the first comprehensive system available for recording the health consequences of hazardous substances emergencis, said Irene Hall, PhD, an ATSDR epidemiologist. These consequences include injury, death, and evacuation.

What ATSDR scientists have learned in 4 years of data collection is that certain aspects of emergency events involving hazardous substances appear to be consistent:

- Most incidents (93%) involve release of only one chemical.
- Most incidents (84%) occur at facilities and not during transportation.
- Industry employees (58% of victims) are more likely than emergency responders or the public to be injured.
- Most of the employees injured (73%) used no personal protective equipment.
- Respiratory (31%) and eye (16%) irritation are the most common injuries.

HSEES data have also revealed that volatile organic compounds, herbicides, and acids were the chemicals most commonly released during emergencies.

However, the substances involved in the most events did not necessarily result in the most injuries.

For example, although chlorine was involved in only 3% of events in 1993, over 32% of these events resulted in injury, indicating chlorine's greater potential for harm.

"It helps to know exactly what the most commonly released materials are so we can tell physicians what to focus on," Dr. Dhara said.

Currently, 14 states report to the HSEES: Alabama, Colorado, Iowa, Minnesota, Mississippi, Missouri, New Hampshire, New York, North Carolina, Oregon, Rhode Island, Texas, Washington, and Wisconsin. ATSDR expects to add a few more states each year.

## Emergency Planning on the Border

Long before the North American Free Trade Agreement was signed into law, the Local Emergency Planning Committee in Cameron County, Texas recognized the need for international cooperation in emergency response.

Each day, hazardous materials are transported across international bridges into the county and its largest city, Brownsville.

Since 1990, Cameron County's Local Emergency Planning Committee has designed and coordinated international emergency response exercises with its Mexican counterpart, Comite Local de Ayuda Mutua in Matamoros, Tamaulipas.

The exercises were designed to allow emergency response teams from both sides of the border to demonstrate their abilities to mobilize personnel and equipment to handle emergencies. Cameron County has a population of more than 260,000.

Brownsville has a population of more the 98,000. The Rio Grande forms the county's southern border and the Gulf of Mexico forms the eastern border.

In 1987, the county formed an LEPC composed of state and local officials, industry representatives, medical personnel, and environmentalist, emergency response personnel, and concerned citizens to conform the Superfund Amendments and Reauthorization Act requirements.

The committee is funded by the Cameron County Commissioners Court and through major donations from local industry.

In May 1990, Cameron County's LEPC and its counterpart in Matamoros held their first joint emergency response exercise, Operation Amigo I. The scenario involved a tank truck leaking hazardous materials with toxic gas plume being carried by the winds to Matamoros.

The exercise required the international crossing of personnel and equipment. More than 200 emergency responders participated in the exercise.

A second full-scale international exercise, Operation Amigo II, was held in Matamoros in November 1991, and the scenario involved a leaking rail car.

In September 1992, a joint exercise, Operation Responder, was held to assist the LEPC in planning for the opening of a new international bridge to Los Indios, Texas.

The exercise tested response to a mock accident involving a tank truck and van.

Local fire department, law enforcement, and medical personnel from the United States participated in the exercise, along with a chemical response team from Quimica Flour in Matamoros.

A fourth exercise, Operation Amigo III, was held in October 1992, at the Port of Brownsville. This scenario involved a sea-going vessel off-loading material into a tank truck.

The U.S. Coast Guard assisted local fire departments, law enforcement, and emergency responders from both sides of the border in the exercise.

Each exercise required six to nine months of planning and involved more than 200 participants. Simultaneous translation (English to Spanish) was provided for planning meetings, during the exercise, and in the post-exercise evaluation.

The Cameron County LEPC and their counterparts in Mexico have developed a mutual response plan.

The effort took several months and many hours of volunteer time. The first draft was presented to the Environmental Protection Agency in October 1994.

Cameron County's LEPC plans to undertake a full-scale international hazardous materials exercise in 1995 to test the final plan.

In addition to conducting response exercises with Mexican counterparts, the Cameron County LEPC initiated a hazardous materials commodity flow study in August 1994.

The team consisted of individuals from a private consulting company, U.S. Customs, U.S. Environmental Protection Agency, U.S. Department of Transportation, Texas Natural Resource Conservation Commission, Texas Department of Public Safety, local emergency response agencies, local industry, members of advisory task force, and volunteers.

The team found major problems with hazardous materials transportation.

Specifically they found many U.S. and Mexican trucking companies weren't complying with all DOT regulations. Some of the areas of non-compliance included the following.

- Vehicles entering and leaving the United States were often overloaded.

  Loads averaged 127,000 pounds, causing severe damage to local roads.

- Unacceptable shipping containers were often used to transport materials. Many containers were homemade and poorly maintained. Some containers observed on vehicles crossing the international bridges were leaking as they entered the United

States.

- Vehicle transporting hazardous materials often had little or no braking ability, no lights or inoperable lights, bald tires showing steel belts, or tires with huge chunks of tread missing.

- Four types of Mexican drivers' licenses were identified and many drivers held more than one license.

  Often none of the licenses allowed the driver to operate vehicles transporting hazardous materials.

- Most vehicles entering or leaving the United State had no insurance or had insurance that didn't meet DOT requirements.

  The team discovered a 24-hour insurance policy could be purchased from a company that didn't exist.

- Most drivers didn't know what they were transporting.

  Many drivers didn't have a manifest. If the driver had a manifest, often it was falsified.

- The team learned quickly not to trust truck placarding.

  They discovered many facility managers and custom brokers told drivers that if they weren't sure what the proper placards were, just throw anything on.

The flow study shed a great deal of light on the long road Cameron County's LEPC still has to travel to be prepared for a hazardous materials emergency, but it has made many strides in pre-planning and working with others.

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## Building Bridges Between LEPCs

The International City/County Management Association coordinates a Peer Exchange Program.

Like the Sister Cities Initiative, the Peer Exchange Program is also supported by the EPA.

Peer Exchange provides the forum for sharing information between LEPCs and others.

To participate in the Peer Exchange Program, LEPCs that need assistance apply to ICMA.

ICMA matches the applicant with potential advisors from other LEPCs that have been identified as having exemplary practices to share with their peers in emergency planning.

The applicant then selects the advisor who best suits the needs of their LEPC.

In four years, more than 200 communities have participated in this Program.

Peer exchanges are conducted one-to-one, through mega-exchanges, and through the circuit-rider system.

Topics are chosen according to the needs of the individual LEPCs.

"More than half of what we do involves one LEPC sharing information with another that has tackled a similar challenge," said June Beittel, ICMA Program Manager.

They can be done in person or by telephone.

For example an upcoming one-to-one exchange will focus on law enforcement's role in emergency management.

In a circuit-rider exchange, an advisor travels to several LEPC meetings.

The circuit-rider may act as a resource for training information or provide organizational and motivational information.

For example, a circuit-rider in Massachusetts visited three towns to advise the LEPC on ways to strengthen their community hazardous materials response plan and improve their organization.

Later, the circuit-rider was invited back to one community to observe and critique a

simulation exercise.

Mega-exchanges involve a larger forum similar to the Sister Cities workshops.

During a recent mega-exchange in Atlanta, Georgia, participants focused on sharing information, resources, and outreach programs for newly formed LEPCs.

Recently, a mega-exchange involved all of the LEPCs in the Hawaiian islands.

Participants discussed new developments in emergency planning and strategic planning to improve LEPCs statewide.

Past exchanges have discussed such topics as compliance, hospital decontamination, incident command, fee systems, liability issues, transportation studies, and emergency response on tribal lands.

ICMA also offers publications as resources to emergency planners.

**Time Effect Analysis Overview**



A Hazard Assessment by Time Effects Analysis is a qualitative, inductive, time-based analytical technique used to determine the timeliness and effectiveness of emergency systems and procedures.

This is accomplished by determining the ability of existing emergency systems and procedures to effectively get people out of harm's way *before* they are adversely impacted by a release of a highly hazardous substance.

An analysis is designed to meet the requirements of EPA's proposed Risk Management Program (RMP) standard, and to be used by stationary sources, LEPC's, and emergency responders.

The analysis is a team approach that utilizes the knowledge and resources of two groups:

- Hazard assessment personnel familiar with consequence assessment methods, process hazards analysis (such as HAZOP, FMEA, What-if, etc.), vapor dispersion modeling, blast overpressure calculations, etc., and

- Emergency response personnel familiar with detection, alarm, mitigation systems, evacuation/safe shelter procedures, emergency communication procedures, etc.

  By bringing these two groups of experts together in this analysis format, existing hazard/ consequence assessment knowledge is utilized to determine the *timeliness and effectiveness* of various emergency systems and procedures.

*Time is the key.* The success or failure of an emergency response is dependent on the relationship of two quantities of time: (1) the quantity of time in which an emergency event develops, versus (2) the quantity of time taken to get people out of harm's way. See Figure 1.

A team comprised of a facilitator/ recorder, operations, environmental, safety, and emergency response personnel (and other experts as needed) conduct the analysis and uses a software recording tool to capture analysis results.

There are two major segments in the analysis -- pre-meeting work and team meetings.

In the pre-meeting work, select members of the team identify emergency planning events (releases) to study.

Since the analysis is *inductive*, only a small number of *representative* events need to be analyzed to determine the overall effectiveness of emergency systems and procedures.

*Critical values* (concentration levels, overpressure values, etc.) are selected to determine the radius of the area potentially affected by a release.

Then exposure groups (onsite employees; offsite schools, hospitals, roadways, parks, malls, etc.) within the affected area radius are designated. Again, since the analysis is *inductive*, only a small number of *representative* exposure groups need to be analyzed.

Then Tc is calculated for each *scenario*.

A scenario is one exposure group within a single event. The Tc time is based on hazard assessment technique results (vapor dispersion modeling or blast overpressure calculations, etc.)

The team meets to estimate minimum and maximum behavior time values for the scenarios determined to be representative in the pre-meeting work.

The minimum time for each of the time values is added to determine a minimum credible time expended (Tt min) for the potential exposure group to become safe.

The maximum time for each of the time values is added to determine a maximum credible time expended (Tt max) for the potential exposure group to become safe. See Figure 2.

The team compares Tc to the Tt values to determine if persons are safe prior to the event impact. If Tt max is less than Tc then the emergency systems and procedures have been validated because people have been warned and have responded properly prior to being affected by the emergency. See Figure 3.

If Tc is less than Tt min, or if Tc falls between Tt min and Tt max, a *change analysis* is performed to lower Tt max to less than Tc, or to increase or eliminate Tc (through mitigation, reduction or releasable quantity, etc.). See Figure 4.

In the change analysis, the team examines how time may be saved by changing or enhancing emergency systems and procedures.

Possible changes are recorded along with their estimated time values, and the impact to Tt min and/or Tt max is calculated.

Various combinations of changes can be examined to optimize time savings and to do so with the least expenditure of time, money, and effort.

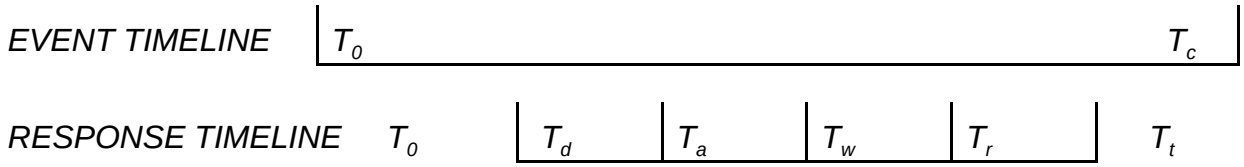
In summary, the analysis results are:

(1) a common understanding of the behavior of releases and affected persons by consequence assessment personnel and emergency response personnel,

(2) Current or proposed emergency systems and procedures are either validated or the need and means for improvement are identified,

(3) A basis for cost/benefit analysis is provided so that money spent on improving emergency systems and procedures can be spent wisely, and

(4) a basis for compliance documentation is provided.




*RESPONSE TIMELINE*

- $T_0$ = The time that the emergency event begins.
- $T_c$ = The time at which the emergency becomes *critical* (those in the affected area at this time will be injured, killed, or exposed to unacceptable levels of a toxic substance or emergency if not out of the affected area by this time).

  The amount of time taken from the moment the event begins ($T_0$) to the time it adversely impacts an exposure group.
- $T_d$ = The time at which a human or a machine *detects* an emergency condition.
- $T_a$ = The time at which a human or a machine *activates* the alarm/alerting system.
- $T_w$ = The time that the *warning* is *complete* (persons affected by the emergency have received the information necessary to safely avoid, evacuate, escape, or take shelter).
- $T_r$ = The time that the emergency *response* is to the point that persons are safe (out of the affected area, safe shelter, in adequate personal protective equipment (PPE), etc.).
- $T_t$ = The total time from the beginning of the emergency to the point that persons are safe.

FIGURE 1

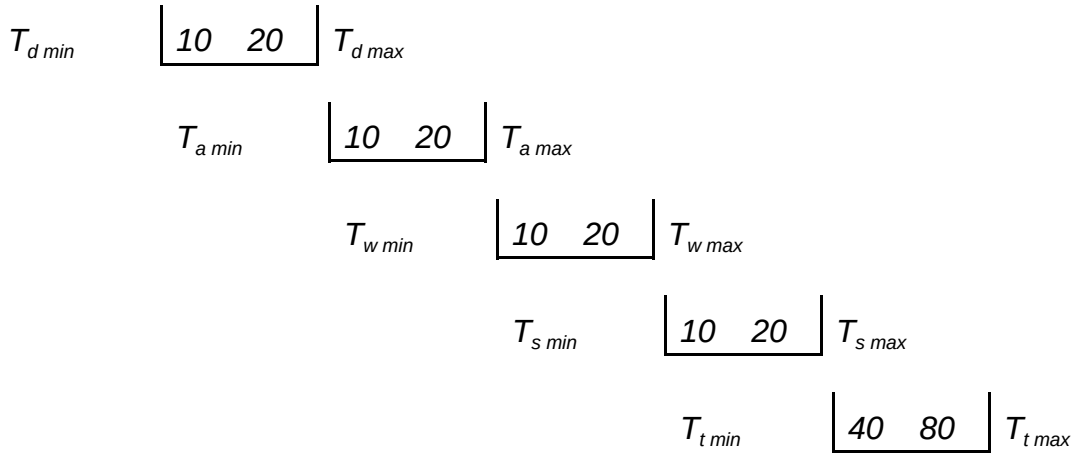



FIGURE 2 - Example of adding minimum and maximum time values (in seconds)


FIGURE 3 - Tc > Tt max

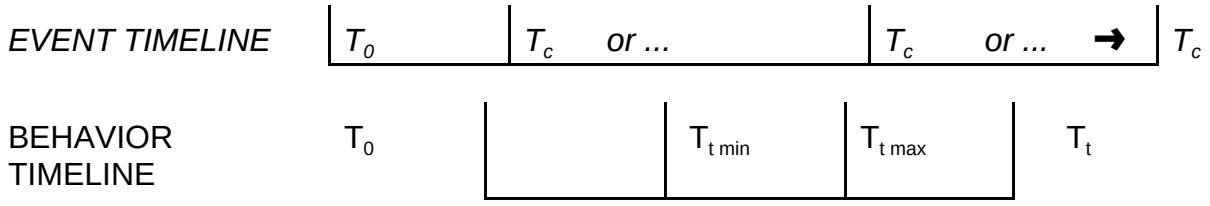



FIGURE 4 - Tc < Tt min or max, increasing Tc

## Federal Highway Routing Regs in Place

As a result of concerns about the expansion of uncoordinated state and local routing designations, Congress passed HMTA - the Hazardous Materials Transportation Act of 1975 - as amended by HMTUSA - the Hazardous Materials Transportation Uniform Safety Act, Section 105(b) of this act required the Secretary of Transportation to establish federal regulations for the highway routing of hazardous materials.

On October 12, 1994, the Federal Highway Administration implemented the requirements of HMTUSA in final rule, MC 92-6, Transportation of Hazardous Materials; Highway Routing.

The rule establishes federal standards and factors which states and Indian tribes must follow if they establish, maintain, or enforce routing designations that

- specify highway routes over which placarded non-radioactive hazardous materials (NRHM) may or may not be transported within their jurisdictions and/or
- impose limitations or requirements with respect to highway routing of such hazardous materials.

In establishing any NRHM routing designation, a state or Indian tribe shall consider the new federal standards and factors.

These standards provide for enhancement of safety; public participation; consultation with others; through highway routing; agreement of affected states and Indian tribes; no unreasonable burden on commerce; timeliness, reasonable access; and responsibility for local compliance.

The factors to be considered include:

- population density,
- type of highway,
- types and quantities of NRHM, emergency response capabilities,
- results of consultation with affected persons,
- exposure and other risk factors, terrain considerations,
- continuity of routes,
- alternative routes,

- effects on commerce,
- delays in transportation,
- climatic conditions, and
- congestion and accident history.

FHWA has not assigned any specific weight to be given by the states or Indian tribes when considering the factors but requires states and Indian tribes to use the most current version of *Guidelines for Applying Criteria to Designated Routes for Transporting Hazardous Materials* or an equivalent routing analysis when analyzing them.

Included in the final rule are amendments to the procedures in 49 CFR Part 297, Subpart E, relating to federal preemption and waiver of preemption and new procedures for dispute resolution involving states and Indian tribes.

States and Indian tribes are required to furnish updated NRHM information for publication by FHWA.

The intent of these requirements is to ensure that NRHM are moved safely and that commerce is not burdened by restrictive, uncoordinated, or conflicting requirements of various jurisdictions.

The regulation requires all states and Indian tribes to initially submit information on all the existing NRHM routing designations within their boundaries to FHWA.

After the initial submission, any new or changed NRHM routing designations can be submitted to the FHWA 50 days after the routing designation takes effect.

FHWA will compile and publish a listing of all current hazardous materials routing designations in the *Federal Register* annually.

## Do You Have a P.O. Box?

Over the past several years, many inquiries have come into the EPA Regional offices regarding contacts for the LEPCs in the Regions.

A problem that is prevalent throughout the Region is that LEPC contact lists identify the name, address, and phone number of the LEPC chair, and too often, this number is a private residence or business.

Unfortunately, turnover among chairs is high.

Because of this, requests for information, newsletters, guidance documents, and other related materials often do not make it to the intended audience.

It is our opinion that every LEPC should have a single, continuing address at which it can receive all material sent to the LEPC.

There are two ways to accomplish this.

Often the LEPC shares facilities with local government entities, such as Emergency Services.

If this is so, and the mail addressed to the LEPC is accepted at this address, this is an adequate solution.

A second solution is for the LEPC to rent a Post Office box.

For an average cost of $35 per year, an LEPC can rent a box from the Post Office.

The P.O. Box number can then be provided to all outside parties as the LEPC's address.

This action would guarantee that, even, in the event of a change of chair, the LEPC would still receive its correspondence.

For more information on obtaining a P.O. Box, contact your local branch of the Post Office.

## EPA: Friend or Foe

*Submitted by Ted Kelso, Vice President, PIC, Inc.* The Environmental Protection Agency was officially brought into being by Congress in 1968.

Its main purpose was to protect the environment from pollution, waste by-products, non-responsible people, etc. It, like most forms of government, has grown exponentially.

This agency has over 2,000 agents across the country serving all 50 states and watching over all kinds of private and public business endeavors ranging from government range land to private dumps, from the coastal waters surrounding the U.S., to aquifers under the ground.

From the protective ozone above the Earth to hydrogen sulfide gas-filled oil wells below.

The EPA has a watchful eye on almost every kind of business in the USA. Are they here to help?

I think so. Without them, we have proven ourselves to be irresponsible.

Raw sewage has been dumped into lakes, streams, the oceans, and Great Lakes.

The EPA definitely has a place in our society. With the help of the EPA, many programs have been established to improve life in America.

Many of our water sources have been cleaned up, thousands of toxic waste sites have been cleaned up, hundreds of thousands of leaking fuel tanks have been found and serviced.

And as a result, our children will have a better world to grow up in than we did.

One of the programs the EPA polices is "Tier Two" reporting.

This program focuses on hazardous products and the companies that use them.

This program is actually underwritten by the Texas Department of Health and enforced by both agencies.

We were unaware of this program until the EPA brought it to our attention. We produce chemicals, hand cleaners, truck wash soaps, etc.

So we use several hazardous products on a daily basis.

Our company has always taken the pose as a responsible citizen. I.E., we do not pollute the air, water, or surface ground around our establishment.

We produce virtually no toxic waste ever.

The containers we buy raw materials in are routinely recycled. In short, we care about the world we live in.

However, we were not in compliance with all the rules and regulations set forth by the State of Texas.

Why not? Good question! The only answer I have is ignorance.

We just did not know the law existed.

Our company has been in business for 7 years and in 7 years of growth and change, our company has moved from being only a sales company to becoming a manufacturer of finished goods.

When this change took place, the list of materials changed also.

We began to use some hazardous materials that we had not been exposed to before.

Sulfuric acid is one of those raw materials.

When the EPA came to call, they were making a routine inspection.

In the course of that inspection, they discovered that we were using some sulfuric acid. Sulfuric acid is shipped to us in 745 pound drums.

The Texas Tier Two program states that if a business stocks more than 500 pounds of sulfuric acid at any time during the year, that business must file a Texas Tier Two reporting form with the state Department of Health.

It only took a few moments to be sure...then it was over, but the crying.

It was August, the cut-off date was March, and we were out of compliance.

Like all governmental agencies, the EPA has rules they must adhere to.

The one the agent cited was the one which read: "The Region has chosen to take a stance of no leniency."

We pointed to the fact that the Federal Regulations call for 1000 pounds before reporting, not 500 pounds; we said nobody sent us forms, or a packet; we said nobody told us and we tried almost everything we could think of, but to no avail.

They found us guilty as charged and we were to await the sentence.

During the weeks that passed, I became more knowledgeable about the EPA, Texas Tier Two and Texas Department of Health.

I discovered a different side to these agencies.

Even though they are branches of the government, they really do have people inside who are willing to help work things out.

Some of the good things that have come from our chance meeting are:

- We now have contingency plans in place... what if plans, what if fire breaks out in the manufacturing plant?

  What if we have a flood? What if the power goes out at just the wrong moment?

  These are all things we really had not considered until the EPA came by.

- We now have monthly safety meetings, our shop personnel are DOT certified, our truck drivers have Hazmat training, and our little company has taken some large strides towards becoming a big company.

- We are now actively participating with the LEPC in our area, and are working hard to inform all of our customers of their potential reporting requirements.

The EPA could have put us out of business. However, because of our willingness to comply, change, and grow, the EPA has allowed us to provide assistance to the LEPC, local responders, distribute packets and information to other businesses to mitigate the proposed penalty.

In our opinion, the EPA is really here to help us all if only we will work together.

## Technological and Natural Disasters

Oil and Water Don't Mix: An earthquake in California; a volcanic eruption in Alaska; a hurricane affecting South Carolina, North Carolina and Virginia; and flooding in Washington State are all cases where natural disasters caused technological emergencies.

Pamela Sands Showalter and Mary Fran Myers of the Natural Hazards Research and Applications Information Center call them "na-tech" (pronounced *nay-tech*) events. In a study recently published in *Risk Analysis*, they examined natural disasters during the 1980s that created technological disasters.

The study, completed in June, 1992 and revised in July, 1993, provides relevant information and warnings to emergency planners and responders.

The authors collected data by reviewing literature, sending a questionnaire to emergency management agencies in all 50 states, and contacting those active in hazards research and mitigation.

They studied all types of natural events from earthquakes to volcanic eruptions in the U.S. and Canada and the technological emergencies they caused.

The authors found, "the U.S. is yet to be the victim of a natural disaster creating a catastrophic technological calamity." But, the study found, such serious events could occur in the U.S.

The research may be useful to local planners and responders because of the wide range of information gathered and presented by the authors.

They note that every natural disaster fosters some sort of technological disaster; therefore, federal, state, and local regulations and emergency plans need to include preparations and response guidelines for na-tech events to protect public and environmental safety.

Showalter and Myers' survey of state emergency management agencies investigated five areas:

- the number of natural disasters as the cause of technological disasters;
- existing codes or regulations that address the possibility of the events;
- intuitive rankings of susceptibility to and satisfaction with steps taken to avoid such events;

- why these events seem uncommon, and;
- suggestions for ways to reduce events.

The authors conclude:

- the number of na-tech incidents is increasing, and this does not appear to be related to improved record keeping;
- even using figures considered artificially low, at least one hazmat incident can be expected for every three natural disasters;
- few regulations explicitly recognize the ability of a natural disaster to cause a hazmat release, which contributes to the lack of preparation for such events;
- most states rank susceptibility to na-tech events high and satisfaction with state preparation for such events low, and;
- managers able to pin-point na-tech events within their states and who had access to state and federal disaster declarations ranked themselves as significantly more susceptible to na-tech events.

Showalter and Myers' findings indicate the number of na-tech events is rising, but the problem has not been studied much. They suggest local, state, and federal agencies look more closely at the problem.

The authors also note difficulty in making policy decisions where there is no data to support the policies. The research shows states need to create and maintain record keeping procedures for tracking the occurrence of na-tech events.

In addition, states should make the information available to policy makers. A standing subscription to the working paper series is available at a cost of $3.00 per copy.

Single copies cost $4.50. For more information contact:

Natural Hazards Research and Applications Information Center
Institute of Behavioral Science #6, Campus box 482
University of Colorado, Boulder, Colorado 80309-0482
(303) 492-6818

## Dispersants and Biological Additives for Oil Spills

There have been some misleading claims regarding dispersant and biological additive use by companies promoting these products.

The use of these materials on oil spills has been closely regulated by EPA since the 1970s.

In the past, there were some spills where dispersant use caused more environmental damage than the original oil spill.

As a result, there has been a tendency by the government not to utilize these tools.

That is unfortunate, as many of the products on the market today are not as environmentally damaging as those used earlier.

Because of the present tight regulatory climate, it is difficult to gain approval for their use. Their use in regulated situations, without EPA approval, can bring about substantial penalties.
The purpose of this article is to inform you of when EPA approval is required and how to get that approval.

When we discuss dispersants here, we are also referring to the requirements for biological additives.

What is a possible illegal application of dispersants? To illustrate, take the case of a traffic accident where fuel is spilled onto a road.

The fire department soaks up much of the product with sorbent and then removes the soaked sorbent.

However, there is enough fuel remaining on the road to raise concerns that the road may be damaged and/or may constitute a traffic hazard.

The fire department applies dispersant (AFFF or equivalent) to the area then flushes the resultant dispersant and fuel into a storm drain. So, what is wrong with this procedure?

The information that came with the dispersants said that it was "EPA approved."

First, let's state what is right. The fire department is doing its job of protecting life and property, and the last thing EPA wants to do is interfere with this process.

Rather, we want to help you do it legally.

Despite what you read in the promotional material from companies regarding use of these products, none are approved for use without spill specific approval for spills involving 'navigable waters'.

The definition of 'navigable water' is so broad that it covers just about anything that is wet. Road ditches, as well as streams and rivers are considered navigable waters.

Just because a dispersant is listed on EPA's Product Schedule does not mean that it can be used in your situation.

In the example above, storm drains are considered to be tributaries to navigable waters; therefore, the fire department would have to contact the EPA Federal On-Scene Coordinator (OSC) and request approval to use the dispersant.

Unless the situation is life threatening, the OSC is required to get concurrence from the State and to consult with the Department of Interior which includes the Fish and Wildlife Service (40 CFR Part 300 - NCP).

Also, flushing oil into a storm drain or ditch may violate other EPA or State regulations (CWA §§308, 311(j) and 402).

Some promotional literature states that dispersants "emulsifies hydrocarbons - makes them water wet - and allows them to be flushed into a sewer, or even safely soak into soil."

What they don't tell you is that all of the oil is still there - it's just in smaller size particles.

If it is flushed into a sewer, it may upset a wastewater treatment plant.

If flushed into a storm drain, you may cause a fish kill.

If you let it soak into sandy soil, you may contaminate shallow drinking water wells.

What should a fire department do?

We recommend that you only use such products with extreme care, if at all.

## EPCRA Questions and Answers

Paint Mixing and the Consumer Product Exemption: *A store sells paint in 5-gallon cans to the general public.*

*Customers may purchase the paint as received from the manufacturer, or they may request a custom shade of paint.*

*To attain the customer's desired shade, store employees will mix two or more base colors. This process involves opening the cans, mixing the colors together, and pouring the custom made shade into a 5-gallon can.*

*EPCRA §§311 and 312 require facility owners and operators to report all hazardous chemicals as defined by 29 CFR §1910.1200(c) that exceed the applicable thresholds found in 40 CFR §370.20(b).*

*EPCRA §311(e)(3) excludes from the definition of hazardous chemical any substance to the extent it is used for personal, family, or household purposes, or is present in the same form and concentration as a product packaged for distribution and use by the general public.*

*For reporting under EPCRA §§311 and 312, will this paint qualify for the consumer product exemption found in EPCRA §311(e)(3), or must the store owner or operator report on the custom-mixed paint since it is processed to achieve the final form purchased by the consumer?*

The paint is exempt from the definition of hazardous chemical under the consumer product exemption in 40 CFR §370.2 regardless of whether it is mixed on the premises or purchased by the consumer in the same form the store received it.

Any substance that is found in the same form and concentration as a product packaged for general distribution qualifies for this exemption.

Since both the manufacturer's premixed paint and the store's custom-made shades are in the same form and concentration as products packaged for distribution by the general public (indeed, they are in such products), none of the chemicals found in either type of paint are reportable under EPCRA §§311 and 312.

Notification Requirements for an Emergency Release on a Public Roadway: *The EPCRA emergency notification regulations require facility owners and operators to immediately report releases into the environment of extremely hazardous substances or CERCLA hazardous substances if the releases exceed specific reportable quantities.*

*The notification must be provided to the SERC and LEPC, except in the event of a transportation-related release where only 911 notification is required.*

*The EPCRA emergency notification requirements do not apply when a release generates no potential for exposure to persons outside the boundaries of a facility.*

*If there is a release from a facility onto a public roadway that runs through the facility, will that release be reportable?*

A release onto a public roadway must be reported under 40 CFR §355.40(a), since the release may result in exposure to persons outside the boundaries of the facility (i.e., on the public roadway).

A release is defined as "any spilling, leaking, pumping, pouring, emitting, emptying, discharging, leaching, injecting, dumping, or disposing into the environment" of designated substances.

The environment includes "water, air, and land". Therefore, a release into the environment, as defined in EPCRA §329, onto a public roadway, is potentially a reportable release.

There is, however, a limited exemption under EPCRA that does not require reporting of any release which results in exposure to persons solely within the boundaries of a facility.

The definition of facility includes "all buildings, equipment, structures, and other stationary items that are located on a single site or on contiguous or adjacent sites and which are owned and operated by the same person".

Since the public roadway is not owned or operated by the facility that spans it, the roadway itself is not part of the facility.

As a result, there is exposure to person outside the facility.

Therefore, the exemption for the reporting of releases that result in exposure to persons solely within the boundaries of a facility does not apply.

Proprietary Compounds and §§311/312 Reporting: *A facility is storing a product mixture on-site. Under OSHA, the facility is required to retain an MSDS for the mixture.*

*According to the MSDS, the mixture contains a zinc compound, but no specific identity or concentration information is provided.*

*OSHA regulations allow chemical manufacturers to withhold this information from the MSDS under a trade secrecy claim.*

*From the MSDS, the owner/operator cannot tell whether the proprietary compound is a hazardous chemical (such as zinc silicofluoride) or an EHS (such as zinc phosphide).*

*To comply with EPCRA §§311 and 312 reporting requirements, the facility must determine whether this mixture exceeds the appropriate inventory threshold level. How would the facility make this determination?*

*Once a quantity is calculated, should it be compared to the hazardous chemical threshold of 10,000 pounds, or should the facility owner or operator assume the compound is an EHS an apply the lower threshold?*

A facility may report on a mixture as a whole or on each hazardous component of the mixture.

The option of reporting by components, however, is not available if the components are not known. In this case, since the MSDS contains no information on the concentration of the proprietary zinc compound, the facility must report the mixture as a whole.

The next step in evaluating whether a facility is required to report under EPCRA §§311 and 312 is to compare the quantities stored on-site to the appropriate thresholds.

For hazardous chemicals that are not EHSs, reporting is required if the facility has over 10,000 pounds on-site at any one time. For EHSs, reporting is necessary if the facility has the chemical on-site in quantities over 500 pounds or the TPQ (whichever is lower).

In this scenario, the specific identity of the chemical is not available to the facility owner or operator.

Because the facility receives an MSDS, the owner or operator can assume that the mixture contains a hazardous chemical.

While the owner or operator has a duty to make all reasonable efforts to determine whether or not the substance is an EHS, if there is no information reasonably available to the owner or operator to make this determination, the regulations do not require reporting the mixture as an EHS.

For the zinc compound mixture, the facility could assume the mixture contains a hazardous substance and apply the 10,000 pound threshold level to the overall weight of the mixture.

In addition, the facility must state that it is unknown whether the mixture contains an EHS by writing this in the appropriate box on the applicable form.

## MSDS - Then, Now, and Tomorrow

The Material Safety Data Sheet (MSDS) is a documented form of hazard communication. In the U.S., the first MSDSs were created to protect workers in the shipbuilding industry from exposure to hazardous materials associated with their trades.

After a lengthy study, OSHA issued the first Hazard Communication Final Rule on November 25, 1983.

This law was created to regulate the manufacturing segment of US industry in the Standard Industrial Classification Codes 20-39. The law has become known as the "Workers Right-to-Know Law."

Organized Labor took issue with the limited scope of the original Hazard Communication Standard (HCS), and sued to have the HCS open to all industry.

On August 24, 1987, OSHA produced a second HCS final rule which mandated that ALL of the industrial sector would be covered by the rule.

Under these laws, all chemical manufacturers and importers were mandated to produce an MSDS for each hazardous chemical, blend, or admixture which they created or imported. Users of these materials were to receive a copy of these MSDSs from their suppliers.

The law mandated that these MSDS documents be written in ENGLISH, but alternate MSDSs in other languages could be prepared.

The MSDS format of the OSHA HCS is presented in Table 1. The ten categories could easily fit in the two to four page MSDSs which were produced after 1983.

The original Standard declared the preparation of an MSDS was required for all chemicals of a hazardous nature. This hazard included not only to man, but also to the environment under various conditions.

As MSDSs were generated for hazardous materials, we began to see the creation of MSDSs for chemicals not hazardous to man or his environment.

Today, there exists in the U.S. MSDSs for some 18,000 basic chemical materials, and literally MILLIONS of MSDSs on blended or interactive materials.

On October 17, 1986, another Federal Law was created to extend the HCS into the public domain.

The president signed into law SARA. This law was divided into four parts, called Titles.

Title III, later taken from the law and presented as a separate law, established the concept of a "Community Right-to-Know". The new law is now known as EPCRA (Emergency Planning and Community Right-to-Know Act).

The combined effect of the "Workers Right-to-Know" and the "Community Right-to-Know" was to increase the quantity of information presented in an MSDS, and to significantly increase the document length.

The simpler, and perhaps more meaningful, two page MSDS grew rapidly into six- or twelve-page documents.

Phraseology changed from a simple language into the language of Industrial Hygienists, Medical Doctors, Emergency Response Personnel, Hazard Waste authorities, and last, but not least, the jargon of the Legal Profession.

Sadly, the effectiveness of the MSDS as an instrument of hazard communication dropped significantly.

Two expanded studies of the MSDSs were made by OSHA and reported in March, 1991. These are now famous studies concerning the ACCURACY and the COMPREHENSIBILITY of the MSDSs available in the U.S. The ACCURACY study showed:

- Chemical identification of hazardous ingredients are provided and serve as an initial point to evaluate the hazard associated with a substance or substances;
- The first aid and personal protective equipment often appears to be presented more as a mechanism to cover all potential consequences than as a useful tool for the product user; and,
- Although there are problems with many MSDSs, it appears that the content is improving with the time of preparation.

The COMPREHENSIBILITY study showed:

- Prior exposure to MSDSs permitted a better comprehension of information than those who have never seen an MSDS before;
- The roles of health and safety training, labeling, and other parts of the HCS play a significant part in worker comprehension; and,

- Comprehensibility is clearly a function of formalized education levels. The higher the formalized education (this study included persons with up to 14 years of formal education), the higher the degree of comprehensibility.

These findings were indicative of a concept which did not fulfill the basic obligation of hazard communication to the average worker.

In many instances, the average worker education level in many U.S. manufacturing facilities is barely above the fourth grade level. How could those workers be expected to:

- Read an MSDS, and secondly,

- Understand what was stated in the MSDS that would permit the worker to adequately protect himself, or the environment, from any hazards a given chemical may possess?

The Chemical Manufacturers Association who wrote the (American National Standards Institute) ANSI Z129.1-1982, 1988 on Precautionary Labeling for Hazardous Industrial Chemicals, has recently completed ANSI Standard Z400.1-1992 on the Preparation of MSDS.

This Standard was released in December, 1993.

The MSDS Standard should help codify the preparation of MSDSs of like materials from different manufacturers.

The adoption of, and implementation of, simpler Hazard Material Identification System (HMIS) or National Fire Protection Association (NFPA) code warnings can shorten the MSDS, provided the MSDS preparer, and the reader, have been properly trained in the significance of the numerical code system.

Adaptation of symbols from the new five-part ANSI Standard on symbolism in the workplace will be most useful in developing the MSDS for illiterates, or persons with limited formal education.

This is ANSI Standard Z535.1-535.5. Parts Z 535.2 (Environmental and Facility Signs) and Z 535.3 (Criteria for Safety Symbols) will be the most applicable parts of the Standard for MSDS preparation.

Just about the time when industry was at the threshold of agreement and similarity in MSDS presentations, two separate events have occurred which may cloud the future for MSDSs.

First of all, OSHA is seriously considering changes in the HCS again.

Secondly, the advent of a Common European Market by the end of 1992 has brought about changes in the hazard communications requirements for the MSDS.

The European Economic Community (EEC) requires the MSDS to address 16 categories of information, as described in Table 2.

It is indeed fortunate that the new ANSI Standard, as proposed by the CMA, has also the same categories, but in a slightly different order (Table 3).

IN CONCLUSION: We can expect additional changes in the MSDS over the next six to eight years as US manufacturers agree with their European counterparts on a common format for MSDSs on like products.

The increase in obligatory categories from 10 to 16 will undoubtably lead to longer MSDSs.

The process in MSDS preparation is just part of an overall HARMONIZATION process where classification systems and safety documentations are related.

Hopefully, the addition of symbols will decrease the accompanying increase in verbiage.

We will continue to see different MSDSs on the same material from different manufacturers unless some regulatory agency, such as OSHA in the U.S., mandates a single MSDS for like materials.

Attempts have to be made to generate generic MSDSs in this country by the American Society for Testing Materials (ASTM) but the concept has met with limited success.

TABLE 1

<u>AN ADEQUATE MSDS MUST CONTAIN:</u>

- Name of the chemical, or chemical blend, and when appropriate, chemical formula, common synonyms, and chemical family.
- Name of manufacturer, manufacturers address, emergency and/or technical telephone number, name of preparer, and date of preparation.
- HAZARDOUS ingredients and regulatory exposure limits if determined by OSHA, ACGIH, or NIOSH.
- Physical data.
- Fire and explosion hazard data.

- Health hazard data, including symptoms and first aid procedures.
- Reactivity data.
- Spill and/or leak procedures to prevent additional damage to the environment.
- Special information for breathing, eyes, and skin protection.
- Special precautions, including disposal information.
- The MSDS may contain regulatory compliance information for federal and state agencies.

TABLE 2

EEC OBLIGATORY HEADINGS FOR MSDS:

- Identification of the substance/preparation and company
- Composition/information on ingredients
- Hazards identification
- First-aid measures
- Fire-fighting measures
- Accidental release measures
- Storage and handling
- Exposure controls/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Ecological information
- Disposal information
- Transport information

- Regulatory information
- Other information

TABLE 3

CMA/ANSI STANDARD HEADINGS FOR MSDS:

- Chemical products and company identification
- Composition/information on ingredients
- Hazards identification
- First-aid measures
- Fire-fighting measures
- Accidental release measures
- Handling and storage
- Exposure controls/personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information
- Ecological information
- Disposal information
- Transport information
- Regulatory information
- Other information

## Chemical Hazard Rating Systems

There are in the United States today two primary HAZARD RATING SYSTEMS.

These are the hazard warning systems as developed by the NATIONAL FIRE PROTECTION AGENCY and the NATIONAL PAINT AND COATINGS ASSOCIATION.

In appearance the symbols used for these warning systems are different, but the numbering code used to identify the degree of hazard is the same.

The National Fire Protection Agency symbol is a color coded four-in-one DIAMOND.

The National Paint and Coating Association symbol is a series of color coded stacked bars, resembling a square-on-side.

For simplicity the DIAMOND shaped code is designated as the NFPA code, while the SQUARE shaped code is designated as the HMIS code.

HMIS stands for Hazard Material Identification System as described by the National Paint and Coatings Association (NPCA).

Both systems designate HEALTH CRITERIA within a BLUE field, FLAMMABILITY CRITERIA within a RED field, and REACTIVITY CRITERIA within a YELLOW field.

A fourth field in WHITE is used in both systems, but for differing purposes.

In the NFPA system WHITE is used to designated SPECIAL NOTICE, such as incompatibility with water, oxidizer, radioactive, acid, or alkali.

The HMIS system uses the WHITE field to describe suitable PERSONAL PROTECTIVE EQUIPMENT a worker should be wearing for handling specific chemicals.

Initial development of the NFPA hazard characterization began in 1952 by the NFPA Committee on Flammable Liquids.

This committee began a Standard between the years of 1957 and 1960.

A proposed Standard was tentatively adopted as a GUIDE in 1960, then adopted as a STANDARD in 1961.

Since 1961 the STANDARD, now known as NFPA STANDARD 704 for the " Identification of the Fire Hazards of Materials," has been amended five times.

The NFPA has chosen a diamond configuration comprised of four square-on-point fields, with a number between ZERO and FOUR indicating the DEGREE OF HAZARD.

HEALTH HAZARDS are found in the BLUE field at the NINE O'clock position.

FLAMMABILITY HAZARDS are found in the RED field at the TWELVE O'clock position.

REACTIVITY HAZARDS are found at the THREE O'clock position, and are found in a YELLOW field.

A SPECIAL WARNING field is presented in WHITE at the SIX O'clock position.

Within the WHITE field one will find warnings about mixing the product with water, oxidizers, acids, bases, corrosives, or radioactive warnings.

Since its development, the NFPA diamond has been intended as an acute (Short Time Duration) warning system for fire-fighters and emergency responders.

The hazard code ratings were never intended as an indicator of chronic (Long Time Duration) warning system.

The hazard warning codes have been readily accepted by fire departments and insurance companies.

Hazard rating codes have been established for many chemicals and blends. These rating codes have been published in books and on wall charts.

As a warning symbol, the NFPA Diamond is commonly found on the side of bulk tanks in chemical tank farms, on the sides of smaller chemical packaging, and on chemical labeling.

Chemical labels which have US Department of Transportation hazard class labels associated with the label do not allow the NFPA diamond on the same label.

The NFPA CODE may be on the label, or a sticker type NFPA diamond may appear on the packaging in another place.

THE HMIS AND HMIS CODE: Early in the 1970's, the NATIONAL PAINT AND COATINGS ASSOCIATION (NPCA) created a hazard rating system similar to the NFPA code.

This code was designated as the HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS) in 1976.

Like the NFPA system, the HMIS identifies acute (short term) hazards of chemical

materials.

The HMIS system utilizes the same color codes for hazard warnings as the NFPA system. Health is described in a field of BLUE, while FLAMMABILITY is described in a field of RED, and REACTIVITY is described in a field of YELLOW.

The WHITE field is used to describe PERSONAL PROTECTIVE EQUIPMENT, utilizing an alphabetic letter code.

The HMIS system utilizes a set of stacked bars to create a nearly square symbol, while the NFPA system utilizes the diamond composed of diamonds symbol.

The major difference between the HMIS and the NFPA systems is in the use of the WHITE field.

In the NFPA system WHITE is employed to indicate incompatibility, while the HMIS system utilizes the WHITE field to identify Personal Protective Equipment that a person should be wearing when handling a specific chemical or chemical blend.

In 1982 Lab Safety Supply, Inc., adapted the HMIS code into the Hazardous Material Identification Guide.

This system utilizes the same color code, 0-4 hazard rating, and Personal Protective Equipment as the HMIS system.

Both the HMIG and HMIS systems define the degree of hazard in accordance with the following table.

| Number | Degree of Hazard |
|---|---|
| 0 | Minimal |
| 1 | Slight |
| 2 | Moderate |
| 3 | Serious |
| 4 | Extreme |

All three systems, the NFPA, the HMIS, and the HMIG, utilize very similar criteria for determining the hazard values which make up the coding sequence for a given chemical or chemical blend.

The NFPA code is described as a potential warning of hazards which firefighters may encounter during an actual fire situation.

The HMIS and HMIG hazard rating systems define hazards which workers may encounter while involved in the handling of materials under WORKPLACE conditions.

Generally speaking, the three codes tend to agree on flammability and reactivity, while the HMIS and HMIG codes may show a slightly higher HEALTH hazard rating.

This increase in the HEALTH HAZARD RATING may reflect an increased concern for warning employees of the potential chronic (LONG TERM) exposure to chemical materials which employees will be exposed to on a day to day workplace environment.

Occasionally we must remind ourselves that the NFPA code is a potential hazard warning system for a materials as it sits in a given location, while the HMIS and HMIG systems describe the potential hazards of routine handling of materials under workplace conditions.
As MATERIAL SAFETY DATA SHEETS become longer, and more complex, the need for identification of hazards in a simplistic manner has lead to the introduction of HMIS, NFPA, or HMIG codes into the MSDS.

The codes can greatly reduce the time needed to evaluate the potential hazard, or hazards, that firefighters, emergency responders, or hazard waste remediation crews will require in the performance of their duties.

HAZARD: Health CODE: NFPA COLOR: Blue

| Hazard | Hazard Potential | Un Hazard Level |
|---|---|---|
| 4 | Could Kill | Packing I |
| 3 | Corrosive to Metals, Skin or Eyes | Packing II |
| 2 | Could Cause Severe Irritation but Reversible | Packing III |
| 1 | May Cause Skin or Eye Irritation | |
| 0 | Minimum or No Hazard | |

HAZARD: Flammability CODE: NFPA COLOR: Red

| Hazard | Hazard | Flash Point | (Liquids) |
|---|---|---|---|
| 4 | Burn Readily | <73 F BP< 100 F | Class I A |
| 3 | Flammable | <73 F BP> 100 F | Class IB,IC |
| 2 | Combustible | 100 F to 200 F | Class II and IIIA |
| 1 | Will Burn When Preheated | >200 F | Class IIIB |
| 0 | Will Not Burn | | |

HAZARD: Reactivity CODE: NFPA COLOR: Yellow

| Hazard | Hazard Level |
|---|---|
| 4 | Readily Capable of Detonation at Stp |
| 3 | Capable of Detonation but Requiring External Forces to Initiate |
| 2 | Violent Chemical Changes at Elevated Temperature and Pressure Reacts Violently with Water |
| 1 | Normally Stable, but Unstable at Elevated Temperature and Pressure |
| 0 | Normally Stable Even under Fire Conditions |

Personal Protective Equipment Codes for HMIS and HMIG Rating Systems

| Letter Code | PPE to Be Worn |
|---|---|
| A | Safety Glasses (S.GL.) |
| B | Safety Glasses, Gloves |
| C | Safety Glasses, Gloves, Synthetic Apron |
| D | Face Shield, Gloves, Synthetic Apron |
| E | S.GL., Gloves, Dust Respirator S.GL., GLOVES, Synthetic Apron, Dust Respirator |
| G | S.GL., Gloves, Vapor Respirator |
| H | S.GL., Gloves, Synthetic Apron, Vapor Respirator |
| I | S.GL., Combination Dust and Vapor Respirator |
| J | S. Goggles, Gloves, SYN. Apron, Combination Dust and Vapor Respirator |
| K | Airline Hood or Mask, Gloves, Full Protective Suit, Boots |
| X | Situation Requires Specialized Handling Instructions |

## What Do Agencies Need to Improve Risk Communication

With funding from EPA's Risk Communication Project, the Center for Environmental Communication at Rutgers University has launched a multi-year study intended to improve government agencies' risk communication practices.

As a first step, the Center sought to identify the types of risk communication research that agencies feel they need to improve their efforts.

Researchers conducted in-depth interviews of 24 agency personnel and academics considered to be experts in risk communication and used their input to design a survey and select a national sample of 145 knowledgeable risk communication practitioners and researchers.

Responses of the 120 members of this sample who returned the questionnaire revealed that there was a great deal of agreement between practitioners and researchers about risk communication research needs.

Both groups expressed serious concern about agencies' commitment to and capacity for effective communication about environmental issues.

They also agreed that three areas should be given top priority as subjects for future research. These were:

(1) the challenges of communicating with communities of different races, cultures, and income levels;

(2) ways to integrate outside concerns into agency decision-making about risks; and

(3) the need to systematically evaluate risk communication efforts.

These are all things agencies feel the need to do but want more guidance on how to proceed.

The Rutgers group will work with these and other findings from the survey to suggest ways to fill agency needs.

This may involve research projects, training materials, and/or creation of a clearing house for risk communication "know how".

## Assessing the Impact of SARA Title III on Industry Practices: Good News and Bad

Title III was intended to encourage industry waste minimization and pollution prevention efforts by providing information to the public, and to give businesses an incentive to communicate with the public about issues of risk and safety.

In an effort to determine what impact Title III has actually had on industry practice, the Center for Risk Communication at Columbia University surveyed a sample of 229 environmental and facility managers at firms in the chemical, petroleum and refining, and pulp and paper industries.

Their many findings include the following:

- While 47% said their firms have increased risk communication activities as result of SARA, 79% believed that the public is generally apathetic about the information generated by SARA, and only 16% said the number of requests for information they receive from the public has increased in the past five years.

- Most managers said that environmental laws have increased their costs and caused needless public concern, but 84% said their firm now pays more attention to toxic substances than five years ago.

- While 75% said that their plant had reduced hazardous waste over the past five years, they were more likely to attribute hazardous waste reductions to other factors than to a desire to improve "community relations."

- Almost half (47%) said their facilities' efforts to communicate with the public have increased since the passage of TITLE III.

- Yet only 36% reported that their facility had an active community relations program, while only 35% had held meetings with community leaders.

  Similarly, 32% had held an open house for the public.

- Fewer than one-in-five facilities had engaged in any of a number of other outreach or public information efforts or even had a public affairs staff.

- Though 42% of the facilities had experienced "environmental problems" and 46% had been subject to an enforcement action in the last five years, only 27% of the managers thought there had been an increase in public or media interest.

The researchers have examined several explanations for differences in firm's responses to Title III and concluded that public access to information may be a factor in decisions to reduce emissions and prevent pollution, despite managers' claims that public opinion is not a motivating factor.

However, since most facilities are not providing the public with information unless specifically asked to do so and few report much public interest, the researchers argue that "...passive availability of information has not worked as a means of increasing public awareness and interest, and thus may be limited as a potential stimulus for encouraging industry to reduce pollution."

They suggest EPA design interventions to increase awareness, provide smaller facilities with support for communication, and encourage industry to take a more active role in outreach.

## National Survey Explores the Risk Reduction and Public Outreach Efforts of LEPCS

LEPCs can go beyond planning the response to chemical accidents to proactively seeking to reduce the risks of an accident.

The results of a survey of LEPCs from across the nation indicated that the communities that are the most likely to engage in risk reduction efforts are those that are the most proactive in communicating with the public.

The 1992 survey was conducted by Professor Jack Kartez at Texas A & M's Hazard Reduction and Recovery Center with the assistance of the University Center for Environmental and Hazardous Materials Studies at Virginia Tech.

It included 260 LEPCs (some of whom had been surveyed in 1989) and was designed to document the organizational structure and planning practices of local communities created under EPCRA.

The survey revealed that a majority of LEPCs had discussed a range of accident prevention and hazard reduction steps, but few had actually taken those steps.

Though 50% of LEPCs had contacted facilities to acquire more accurate information for planning and 40% had met with facilities to discuss safety, only 3 to 12% had taken action such as pursuing "good neighbor agreements" with facilities, advocating transportation route changes to reduce risks, encouraging reductions in the use of toxics, or providing hazardous materials information to local zoning commissions.

Analyses revealed that the factor most strongly associated with LEPCs' risk reduction activities was their level of public outreach and hazard communication.

The LEPCs that undertook the highest overall number of public outreach initiatives also scored highest on the number of efforts to reduce chemical hazards and prevent accidents.

LEPC members may be concerned that aggressive public information efforts will adversely affect the cooperation and support they receive from local industry.

However, in this sample, the level of active outreach is positively associated with the level of assistance LEPCs receive from private facilities.

Those LEPCs that reported a higher number of public information efforts also reported receiving more assistance from local industry.

While the cause and effect relationship here can not be determined with these data, this result suggests that LEPCs do not have to choose between informing the public and maintaining good relationships with local industry.

A second factor which has positively associated with LEPCs hazard reduction and accident prevention efforts was continuous neighborhood group participation generally engaged in more risk reduction activities.

However, a comparison of the 1989 and 1992 responses indicated that neighborhood groups were actually less likely to hold memberships in the LEPCs in 1992.

At the same time, a larger proportion of the LEPCs reported environmental group membership in 1992 than in 1989.

## Ordinance Approved for Houston HMRT and LEPC

The Houston City Council has given approval to the changes proposed by an LEPC ad hoc committee for the ordinance that established charges for the service of the Hazardous Materials Response Team (HMRT).

The changes, effective March 31, lower the service fee for HMRT and provide for annual contributions that exempt the service charge.

Fees dropped to $15 per minute from the $65 per minute charge in the original ordinance.

Timing for the service fee begins when the HMRT arrives at the scene.

Annual voluntary contributions are offered in the revised ordinance and vary with the number of employees of a facility:

- 1-5 employees, $100;
- 6-10 employees, $250; and
- more than 10 employees, $500.

The annual contribution covers the facility site only.

Transporters may pay an additional annual contribution for their fleet when vehicles are away from the site, based on the site of the fleet:

- 1-5 vehicles, $100;
- 6-10 vehicles, $250; and
- more than 10 vehicles, $500.

Railcars off site and pipelines can be exempt from HMRT service fees for $500.

Annual voluntary contributions have a maximum of $5000 for any one business entity.

Homeowners are exempt from the charge in the revised ordinance.

Three conditions must be met to exempt homeowners:

- The responsible party is not an employee of a business entity;
- the responsible person is involved solely for private, noncommercial purposes related to the individual's own personal property, and
- is to receive no compensation for the services involving the hazardous material; and the hazardous material is in a form, quantity, and container ordinarily and lawfully available for sale as consumer products.

Local, state, and federal governments are also exempt from charges in the revised ordinance.

The ordinance exempts responses to facilities that have mutual aid contracts with the city.

Also in the ordinance is the requirement that any spill or release of a hazardous material must be reported immediately to the fire department dispatcher.

Violators are subject to a fine of not less than $250 nor more than $2,000.

Annual voluntary contributions are due on March 1 of each year and exempt the contributor from charges until March 1 of the following year.