



Course Title:	Emergency Response to Chemical Spills Technician Level	Length:	24 hrs
Curricula Area:	Emergency Response to Chemical Spills		
Description of Curricula:	The course provides participants an opportunity to learn basic skills and knowledge about protecting the health and safety of personnel, the environment and property when responding to the accidental release of hazardous materials. Recognition and control of hazards at the scene are presented through illustrated lectures and small group activities.		
Format of Delivery:	50% hands-on field exercises, 30% classroom lecture/demonstration, 20% classroom participation		
Evaluation:	PASS/FAIL, quizzes, exercises, 100% hands-on		
Regulatory Reference:	29 CFR 1910.120		
Curricula Provider:	The Alliance for Business: Crowder College / Missouri Southern State University 800.783.8053		
Date of Development:	1992	Date of Last Revision:	2006
Intended Audience:	Business and industry that handle hazardous chemicals, public responders, volunteer fire departments, law enforcement, EMS, and public works employees.		
Entry Restrictions:	Physically capable of wearing and working in various levels of personal protective equipment (PPE) and the utilizing of respiratory protective devices.		
Topics:	Lesson 1 - Hazardous Materials Emergency Response Intro. Lesson 2 - Toxicology Lesson 3 - Chemical Awareness Lesson 4 - Monitoring Equipment Lesson 5 - Personal Protection Equipment Lesson 6 - Safety Lesson 7 - Site Control Lesson 8 - Decontamination Lesson 9 - Incident Command System Lesson 10 - Industrial and Environmental Spill Response		
Components of Curricula:			
Student Manual	Emergency Response to Chemical Spills, ©2006, 222 pages		
Instructor Manual	Emergency Response to Chemical Spills Instructor Manual, 265 pages		
Other Instructor Resources	PowerPoint overheads, PPE and Equipment to accompany each unit		
Supplemental Materials	Response Activities Supplement Book, 126 pages; Internet resources and Cameo where appropriate		
AV Media	The instructor manual lists videos, CD-ROMs, and overheads to supplement course materials.		

Reference Materials	DOT-ERG, NIOSH Pocket Guide and multiple chemical/toxicological reference materials will be needed to complete this course.
Equipment and Supplies	Significant equipment, apparatus and supplies are required to complete this program. They include levels A, B, C, and D personal protective apparel respiratory protection equipment, monitoring equipment, decontamination supplies, and spill response materials.
Caveats:	<p>This material has been copyrighted by HMTRI. A recipient of the material other than the federal government may not reproduce it without permission or license from HMTRI, the copyright owner.</p> <p>The material was prepared for use by experienced instructors who are educated in adult education and training methods and who have completed HMTRI's 99-hour Great Environmental Safety Trainer (GreatEST) program.</p> <p>The text for this program was prepared for English-speaking students with a minimum 9th grade reading level.</p> <p>To complete the respiratory protection and PPE activities, the participant must be physically capable of wearing a respirator.</p>
Instructor Qualifications:	For classroom components, one instructor is required who has completed HMTRI's GreatEST Train-the-Trainer or equivalent and who possesses knowledge and experience in the areas of emergency response operations and mitigation, health and safety, toxicology, industrial hygiene, OSHA and EPA regulations. For hands-on training, a ratio of one instructor for every five students using PPE and respiratory protection must be maintained. One instructor should be certified in first aid and CPR.
Special Instructions:	This program may be formatted for delivery in an Environmental Technology one semester-hour college course consisting of 16 hours of lecture/demonstration and 8 hours of laboratory.
Examples of Training:	 

Curricula Area: Emergency Response to Chemical Spills

Course Objectives:

Upon completion of the course, the participant should be able to:

1. Accept the need for OSHA regulations and understand related HAZWOPER requirements.
2. Identify hazardous substances.
3. Differentiate between an incidental release, an operations level spill, and a hazardous materials release.
4. List the ten steps for a safe response to chemical spills.
5. Describe the basic operating procedures for a spill response team.
6. State the importance of the following terms:
 - Dose Response/LD 50

- Permissible Exposure Limits (PEL)
 - Threshold Limit Value (TLV)
 - Time Weighted Average (TWA)
 - Short-Term Exposure Limit (STEL)
 - Ceiling Limit (C)
 - Immediate Danger to Life and Health (IDLH)
 - Routes of Entry
 - Acute and Chronic Exposure
7. List the four main routes of toxic substance entry into the body.
 8. Identify procedures to protect yourself from toxics.
 9. Differentiate between the "acute" and "chronic" effects of exposure to toxic substances.
 10. List the primary health hazards associated with acids and bases.
 11. Describe the basic treatment for skin and eye exposure to chemicals.
 12. Identify materials that are incompatible with corrosives.
 13. Define flashpoint and how it relates to flammable range.
 14. List the acute and chronic effects of solvent exposure.
 15. Identify limitations when interpreting readings using various monitoring devices.
 16. Rank the level of protection provided by a respirator based on the respirator's protection factor.
 17. List two factors that affect the protection provided by an air-purifying respirator.
 18. Identify considerations for selecting protective clothing.
 19. Describe procedures for the inspection of chemical protective clothing.
 20. List measures that can be taken to minimize the risk of heat-related injuries.
 21. Differentiate between hazard and risk.
 22. List three lines of defense used to manage risk from spills.
 23. Describe the basic concepts of safety as they relate to "acceptability of risk."
 24. Define a confined space.
 25. List preliminary steps for safe entry into a confined space.
 26. Describe the functions of the person in charge, the "Initial Incident Commander."
 27. Identify five basic initial actions that are employed in site control at a spill or release.
 28. List and describe the three geographic hazard zones used in site management.
 29. Identify procedures for a minimum dry decontamination line.
 30. Describe the purpose of the Incident Command System.
 31. Describe a basic decontamination line.
 32. List the factors that affect the behavior of a released hazardous material.
 33. Describe methods used to reduce the amount of toxic and flammable vapors at a spill.

Performance Measures:

All students will be required to participate in the hands-on training and will be evaluated by the Lead Trainer based on course objectives. Those students who are not given a "pass" will be given an explanation in writing and will be issued a "qualified" or "restricted" Certificate of Completion. Students are also expected to be participatory in all classroom and supplemental activities as directed by the Lead Trainer.

Hands-on Exercises:

Upon completion of the "hands-on" component of this program, the participant should be able to demonstrate proper use of:

- SELF-CONTAINED BREATHING APPARATUS (SCBA) through pre-use inspection, donning, use, doffing and post-use cleaning and storage of the unit.
- A BASIC SIX-STEP DECONTAMINATION LINE through set-up, use, and post-use

- cleaning and storage of the equipment.
- AIR-PURIFYING RESPIRATORS (APR) through pre-use inspection, cartridge selection, donning, use, doffing and post-use cleaning and storage of the unit.
 - PERSONAL PROTECTIVE EQUIPMENT LEVELS A, B, C, and D through pre-use inspection, donning, use, doffing and post-use cleaning and storage of the equipment.
 - DRUM TRANSFER to transfer a flammable liquid from a damaged drum to a salvage drum.
 - AIR BAG DEPLOYMENT to control leaking tanks.
 - APPLICATION OF CAPPING KITS (A KIT, B KIT, AND C KIT) to control leaking chlorine gas or sulfur dioxide gas.
 - pH PAPER to indicate the pH of a liquid sample.
 - A COMBUSTIBLE GAS INDICATOR and an OXYGEN MONITOR through set-up, calibration, use, and post-use cleaning and storage of the monitor.
 - A DETECTOR TUBE PUMP and DETECTOR TUBE to determine the concentration of a hazardous gas.
 - PLUG/PATCH AND OVERPACK ACTIVITIES to contain a damaged 55-gallon drum.
 - PERSONAL PROTECTIVE EQUIPMENT LEVEL A pressurization.
 - CHEMICAL SPILL RESPONSE to mitigate a corrosive release.
 - MONITORING EXERCISES to identify unknown contaminants.
 - RADIO COMMUNICATION EXERCISE to develop radio communication competency and develop skill in radio transmission protocol.

Use of Advanced Technology in Curricula:

All presentations for the course are illustrated with PowerPoint®-driven computer slides and animations projected with a video projector. A mix of 35 mm slides and videotapes adds variety to presentations. Digital cameras and video cameras are used to record and critique hands-on exercises. Students learn to access the Internet to retrieve chemical data, find health and safety information, and to look for lessons learned from activities similar to those presented in the classroom.

Course Schedule:

Day 1		Day 2		Day 3	
8	Regulations Overview with hands-on exercises	8	Safety with hands-on exercises	8	Industrial Spill Response with hands-on exercises
9	Toxicology with hands-on exercises	9	PPE Clothing with hands-on exercises	9-10	Monitoring Equipment with hands-on exercises
10-11	Chemistry - Corrosives with hands-on exercises	10-11	Personal Monitoring		11
12		12		12	
1-2	Chemistry - Solvents with hands-on exercises	1	Site Control with hands-on exercises	1-4	Team Drill Exercises and response scenarios
3-4	Respiratory Protection with hands-on exercises	2	Decontamination with hands-on exercises		Debriefing and final review of training
		3-4	Incident Command with hands-on exercises		

