

COURSE TITLE:	Air Monitoring For Hazardous Materials Technicians	Course No. & Version:	HAZ014
TOPIC AREA:	Hazardous Materials	LEVEL:	Technician
SOURCE:	Inhouse	Course No.	HAZ 014

PRIMARY DOMAIN:	<input type="checkbox"/> Didactic <input type="checkbox"/> Psychomotor <input checked="" type="checkbox"/> Combination		
DELIVERY METHOD:	40% Lecture 60% Hands-on % Distanced % Distance % Other:		
DURATION:	24 Hrs	SCHEDULING:	Three 8 hour days 0900-1730 An optional 4 th day allows for field simulations
PROGRAM GOAL:	Upon completion of this program, the Hazardous Materials Technician, given various types of equipment, will demonstrated the ability select, operate and interpret air monitoring instruments for the pupose of identifying and quantifying air borne hazards and IDLH environments.		
TARGET AUDIENCE:	The target audience for this program includes emergency response personnel responsible for the implementation of air monitoring procedures and the analysis of unidentified hazardous materials during incidents involving the release of potentially hazardous substances. Both active hazardous materials technicians and those persons studying for such a position will benefit from this program. Although attendance in a basic field hazardous materials chemistry program is helpful, it is not a prerequisite for this class.		
COURSE DESCRIPTION:	This program is designed to provide the participants with an understanding of the principles and proper use of air monitoring equipment during hazardous materials emergency response. The program takes the participant through the hazard assessment, dispersion prediction and verification process necessary for effective air monitoring operations. Once students are provided with the essential basic understanding of the principles, they are then provided with opportunities for hands-on application during both tabletop and simulation settings.		
MAX STUDENTS:	20	MAX INST. RATIO:	1:5
STANDARDS MET:	Florida SERC TECH – 2.3.2, TECH – 2.3.3, TECH – 2.3.4, TECH – 2.3.5 TECH – 2.3.6, TECH – 2.3.7, TECH – 2.3.8 OSHA 29 CFR 1910.120 Hazardous Waste Site Operations and Emergency Response OSHA 29 CFR 1910.1200 Hazard Communication Standard		

APPROVALS		
Organization	No. / Date	Conditions
Florida Fire College	PD5081	Class must be pre-approved in FCDICE Database
NOTES		

Air Monitoring for Haz-Mat Technicians

Program Description

This program is designed to provide the participants with an understanding of the principles and proper use of air monitoring equipment during hazardous materials emergency response. The program steps the participant through the hazard assessment, dispersion prediction and verification process necessary for effective air monitoring operations. Once students are provided with the essential basic understanding of the principles, they are then provided with opportunities for hands-on application during both laboratory and field evolution settings. Topics include:

Basic Principles

- Chemistry related to air monitoring
- Establishing action levels
- Instrument factors and inherent safety
- Basic instrument features
- Field maintenance and documentation
- Analytical systems management

Toxicity Monitoring

- Exposure limits and calculations
- Colorimetric and electrochemical detectors
- Military detection (M8, M9, M256, M18)
- Photo and flame ionization detectors
- Personal sampling monitors

Common Instruments and Applications

- Corrosivity and radiological
- Oxygen and combustible gas detectors
- Instrument calibration procedures

Advanced Instruments

- Ion Mobility Spectrometry
- Surface Acoustical Wave (SAW)
- Gas Chromatography
- IR Spectrometry
- Combinations (CG/PID, CG/FID, CG/MS)

Target Audience

The target audience includes emergency response personnel responsible for the implementation of air monitoring procedures during incidents involving the release of potentially hazardous substances. Both active hazardous materials technicians or those persons studying for such a position will benefit from this program.

Air Monitoring for Technicians (Three Day)

Educational Objectives

- TECH – 2.3.2 Identify the steps in the analysis process for identifying unknown atmosphere.
- TECH – 2.3.3 Identify the type(s) of monitoring equipment (test strips and reagents) used to determine the following hazards:
1. Corrosivity (pH)
 2. Flammability / combustibility
 3. Oxidizing potential
 4. Oxygen deficiency / enrichment
 5. Radioactivity
 6. Toxic exposures
- TECH – 2.3.4 Identify the capabilities and limiting factors associated with the selection and use of the following monitoring equipment, test strips and reagents:
1. Carbon monoxide meter
 2. Colormetric tubes
 3. Combustible gas indicator (CGI)
 4. Oxygen meter
 5. Passive dosimeter
 6. Photoionization detectors (PID)
 7. pH papers, pH meters, and test strips
 8. Radiation detection instruments
 9. Reagents
- TECH – 2.3.5 Demonstrate how radiation detection instruments may be used defensively.
- TECH – 2.3.6 Given examples of various hazardous materials and the following monitoring equipment, select appropriate monitoring equipment to identify and quantify the materials.
1. Carbon monoxide meter
 2. Colormetric tubes
 3. Combustible gas indicator (CGI)
 4. Oxygen meter
 5. Passive dosimeter
 6. pH papers, pH meters, and test strips
 7. Radiation detection instruments
- TECH – 2.3.7 Demonstrate the field maintenance, testing and calibration procedures for the monitoring equipment, test strips and reagents.
- TECH – 2.3.8 Demonstrate the use of conversion charts associated with monitoring devices provided by the equipment manufacturer.
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Air Monitoring for Technicians (Three Day)

Program Schedule

DAY 1: Introduction—Basic Principles

Registration, Introduction, Course Overview
Basic Principles of Air Monitoring Instruments
Activity 1 – Determining Instrument Characteristics

Lunch 1200 – 1300

Case Study # 1
Chemistry and Establishing Action Levels
Introduction to Instrument Types
Activity 2 – Determining Air Monitoring Needs
Review

DAY 2: Common Instruments and Application

Site Specific Air Monitoring Plans
Corrosive Detection
Radiological Monitoring
 Ionization, GM, Scintillation and Gamma Spectroscopy
Oxygen & Combustible Gas Detectors
Introduction to Toxicity Monitoring and Electro-Chemical Sensors
Toxicity Monitoring, Colorimetric Devices
 Including Military Colorimetric (M-8, M-9, M-256 and M-18)

Lunch 1200 – 1300

Exercise – Initial Monitoring
 Lab 1 – pH, Radiation Monitoring
 Lab 2 – CGD and Oxygen Lab
 Lab 3 – Calibration Lab
Review and Discussion (key points learned)

DAY 3: Toxicity Monitoring

Photoionization Detectors
Flame Ionization Detectors
Basic Principles of Ion Mobility Spectrometry and Surface Acoustical Wave
Basic Principles of Gas Chromatography (GC)
Infrared Spectroscopy and gas analysis

Lunch 1200 –1300

Management Issues Related to Air Monitoring (The ERP)
Developing an Air Monitoring Plan
Cumulative Lab
 Lab 1 – pH CGD Calibration Check and Use
 Lab 2 – Colorimetric tubes
 Lab 3 – PID/FID
Final Cumulative Activity
Program Completion
