



NEW JERSEY FIREFIGHTER SKILLS ADDENDUM



PUBLISHED BY
THE NEW JERSEY
DIVISION OF FIRE SAFETY
IN COOPERATION WITH KEAN UNIVERSITY



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THE NEW JERSEY FIREFIGHTER SKILLS ADDENDUM

The Division of Fire Safety in partnership with Kean University has developed the New Jersey Firefighter Addendum to address the state specific regulations and standards responsible for firefighter safety and health. This booklet is the work of members of the fire service along with various agencies and public entities, such as the New Jersey State Office of Public Employees Occupational Safety and Health (PEOSH) the New Jersey Department of Health and Senior Services, the New Jersey Board of Public Utilities, Jersey Central Power and Light Company, Public Service Electric and Gas Company, New Jersey Natural Gas Company, Elizabethtown Gas Company, AEGIS Loss Control.

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The New Jersey Division of Fire Safety wishes to acknowledge the Training and Education Council for assisting in the development of the material in this manual.

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NOTICE TO THE READER

The material presented in Section B “New Jersey Fire and Emergency Service Resources”, and Section C “New Jersey Fire Service Standards and Regulations”, is declared public domain material obtained from adopted Acts, Statutes, Rules, Regulations and/or Standards from the U.S. Federal Government, State of New Jersey Government, and other safety/testing, engineering or fire service industry organizations. Information presented is obtained from public domain documents, or created through the New Jersey Division of Fire Safety for the specific purpose to convey pertinent fire safety information to the New Jersey Fire Service. The material presented in Section D “Public Utilities, Propane, and Carbon Monoxide Hazards” Chapter I and Chapter II are based on the work of the Associated Electric & Gas Insurance Services Limited and AEGIS Insurance Services, Inc. (“AEGIS”) and used with their permission for the purpose of training the New Jersey Fire Service. Information presented in the Appendix Section represents official Guides, Models, Standards, Regulations, and Acts which have been either adopted and/or created for fire service emergency operations. The Appendix Section material has been deemed public domain.

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CONTENTS

ACKNOWLEDGEMENTS.....	v
FOREWORD.....	vi
DEDICATION.....	vii
SECTION A	1
Introduction and Welcome.....	1
How to Use This Addendum.....	2
SECTION B NEW JERSEY FIRE AND EMERGENCY RESOURCE	3
Objectives.....	3
New Jersey Government.....	3
New Jersey Division of Fire Safety Objectives.....	3
Division of Fire Safety Programs.....	5
Bureau of Fire Code Enforcement Programs.....	6
Bureau of Fire Department Services Programs.....	7
Other State Resources.....	10
Review Questions.....	10
SECTION C NEW JERSEY FIRE SERVICE STANDARDS AND REGULATIONS 11	
Objectives.....	11
Public Employees Occupational Safety and Health Act (PEOSHA).....	11
What Standards Apply to Firefighters.....	12
How Regulations Are Enforced.....	13
Scope and Standards Information.....	13
Organization Information.....	13
Physical Ability and Disability.....	14
Protective Clothing Requirements and Deadlines.....	14
Respiratory Protection Devices.....	18
Life-Safety Rope, Harness, and Hardware.....	19
Personal Alert Safety Systems (PASS).....	20
Hearing Protection.....	22
Filling Air Cylinders.....	22
Apparatus Operational and Passenger Safety.....	22
Maintenance of Firefighter Equipment.....	22
NJ Fire Service Incident Management Systems.....	23
Firefighter Safety.....	23
Safety Officer.....	23
Emergency Radio Traffic.....	24
Evacuation Signal.....	27
Rapid Intervention Crews.....	28
Medical Unit / Responder Rehabilitation.....	29
Incident Timekeeping.....	31
Accountability.....	33
Emergency Lights.....	39
Public Employees Occupational Safety and Health Bloodborne Pathogens Standard.....	42
Potentially Infectious Materials.....	42
How Are Employees Exposed? Materials.....	42
Major Requirements of the Standard.....	42
Training Resources.....	44
Right-To-Know.....	47
Hazard Communication Standard.....	53
Review Questions.....	58
SECTION D PUBLIC UTILITIES, PROPANE, AND CARBON MONOXIDE HAZARDS	59
Introduction.....	59
CHAPTER I RECOGNIZING AND AVOIDING THE HAZARDS OF ELECTRICAL EQUIPMENT	60
Introduction.....	60
Electricity - The Basics.....	60
The Electric System.....	62
Electrical Shock.....	64
Anatomy of an Electric Shock.....	65
Responding to injuries.....	66
Approaching Energized Areas.....	66
Overview.....	66
Precautions When Approaching Downed Lines.....	67
Circle of Safety.....	67
Storm Conditions.....	67
Vehicle Rescue from Downed Power Lines.....	67
Electricity in Building Fires.....	68
Substation, Plant, and Transmission Fires.....	69
Components of a Substation.....	69
Power Transformers.....	69
Power Circuit Breakers.....	69
Distribution Circuit Breakers/Recloses.....	69
Definitions.....	72
Review Questions.....	72
CHAPTER II RECOGNIZING AND AVOIDING THE HAZARDS OF NATURAL GAS AND CARBON MONOXIDE	73
Introduction.....	73
Properties and Characteristics of Natural of Gas.....	73

CONTENTS

The Natural Gas Delivery System.....	76
Natural Gas Utility Oversight.....	81
Keeping the Gas System Safe —	
Damage Prevention and Response.....	81
Prevention.....	81
Case Study II-1: NTSB/PAB-04/01: Excavation	
Damage to Natural Gas Distribution Line	
Resulting in Explosion and Fire,	
Wilmington, Delaware, July 2, 2003.....	82
Detection Methods for Natural Gas.....	82
Case Study 11-2: NSTB/PAB-00/01: Natural Gas Service	
Line and Rupture and Subsequent Explosion and Fire,	
Bridgeport, Alabama, January 22, 1999.....	83
When Gas Escapes the System.....	83
Initial Response.....	84
Secure the Site.....	84
Leaking Gas.....	84
When Gas Is Escaping Outside a Building.....	85
Damage to Gas Facilities.....	85
When Gas Is Burning Out of Doors.....	85
When Escaping Gas Is Found in Buildings.....	86
When Escaping Gas Is Burning in Buildings.....	86
Gas Burning Inside.....	86
Dealing with Natural Gas Fires.....	87
Compressed Natural Gas Vehicle Emergency	
Response.....	89
Carbon Monoxide—Cause, Effect, and Response.....	90
Cause.....	90
Effect.....	90
Emergency Response.....	91
Review Questions.....	92

CHAPTER III RECOGNIZING AND AVOIDING THE HAZARDS OF PROPANE

Introduction.....	93
Properties and Characteristics of Propane.....	93
Propane Delivery System.....	94
Keeping the System Safe.....	94
General Emergency Response Procedures.....	94
Propane Cargo Truck Emergency Response.....	96
Propane Vehicle Emergency Response.....	97
Barbecue Grill Fire/Leak Response.....	97
Review Questions.....	97

APPENDIX I NJ PUBLIC EMPLOYEES

OCCUPATIONAL HEALTH AND SAFETY ACT.....	98
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APPENDIX II NJ PUBLIC EMPLOYEES OCCUPATIONAL HEALTH AND SAFETY ACT REGULATIONS.....	110
--	-----

APPENDIX III THE NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW ACT.....	117
--	-----

APPENDIX IV REGULATIONS FOR THE NJ PERSONNEL ACCOUNTABILITY SYSTEM.....	124
--	-----

APPENDIX V REGULATIONS FOR THE NJ INCIDENT MANAGEMENT SYSTEM.....	128
--	-----

APPENDIX VI PUBLIC EMPLOYER'S GUIDE AND MODEL WRITTEN PROGRAM FOR THE HAZARD COMMUNICATION STANDARD.....	132
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APPENDIX VII DEVELOPMENTAL DISABILITIES AWARENESSES ACT.....	225
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NEW JERSEY STATE FIRE MARSHAL

New Jersey Division of Fire Safety

Dear Firefighter Recruits:

Welcome and congratulations on taking the first step in your training to become a firefighter. We commend you for your desire, your commitment of time and effort, and lastly, your enthusiasm to join the brother/sisterhood of the fire service.

As you advance through your Firefighter I training, please embrace the subjects that are contained in this basic recruit curriculum. Keep in mind that your future success and safety will be forged by the course's 135 hours.

The New Jersey Division of Fire Safety has partnered with county and municipal fire training academies to ensure that training is standardized and that your textbook, New Jersey addendum materials, study guide, and instructional materials are identical. We believe this training curriculum provides the best instructional and student learning resources ever and will be instrumental in honing your firefighting knowledge and practical skills.

The fire service instructors who work to develop your knowledge and performance capabilities are dedicated, skilled professionals. They bring extensive know-how and many years of experience into the classroom to guide you through this nationally accredited Firefighter I training program. You may have heard that "no two fires are the same." We believe this is true, but there are common elements and lessons to be learned from each fire incident. Your instructors will bring these common threads together to provide you with fire ground survival information.

Firefighter I is just the beginning of your professional development, and we urge you to attend additional training programs and be recognized as a true fire service professional. Therefore, your fire department, county/municipal training academy, community college, national fire service training institutions, and the New Jersey Division of Fire Safety are committed to serve your continuing educational needs.

New Jersey Division of Fire Safety
Office of Training and Certification

DEDICATION

This manual is dedicated to those brave men and women in the New Jersey Fire Service who have lost their lives in the battle to fight fire and save the lives of their fellow community members.



Additionally, the manual acknowledges the hard work, professionalism, and dedication exhibited by New Jersey's Fire Instructors to ensure our State's Firefighters perform to his or her best ability at every emergency incident.

WELCOME

SECTION A

OUTLINE

- Introduction and Welcome
- How to Use This Addendum

INTRODUCTION AND

WELCOME

Welcome to the fire service in New Jersey! This special supplement was designed especially for you, the new firefighter, as you join the proud and dedicated men and women who make up New Jersey's fire and emergency service system.

As a firefighter, you play an important role in keeping communities, businesses, and private industries safe. You are the first line of community defense, and you have the potential to touch many lives as you respond to emergencies throughout your time in the fire service.

The New Jersey Division of Fire Safety, along with a variety of other state and local governmental agencies, stand behind you to provide the resources that will help you do your job. The goal of providing this special supplement is to ensure consistent training across the state and in the many academies and training centers that you will utilize throughout your career. If used properly, it will expand the quality and depth of knowledge necessary to get firefighters started on their career, and enhances the safety of personal operating at emergency incidents. The Division of Fire Safety has partnered with Jones and Bartlett to offer this unique addendum as a supplement to *The Firefighter's Handbook*, your basic tool for firefighter training, Figure A-1.

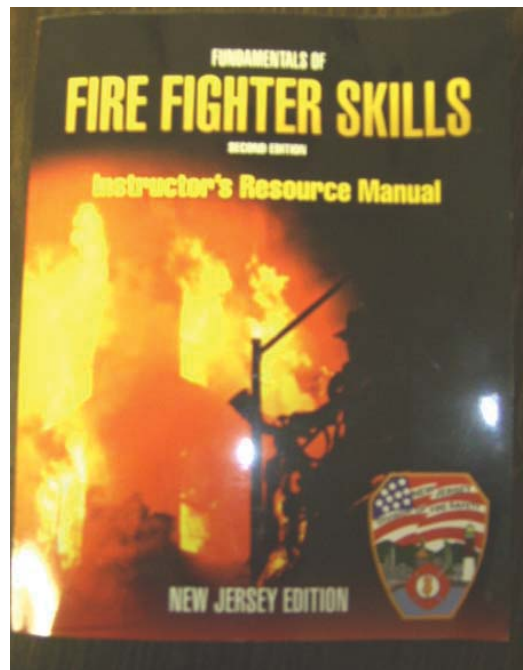


Figure A-1 This addendum is a supplement to the Firefighter's Handbook.

2 SECTION A

The New Jersey Division of Fire Safety is striving to provide the best possible teaching, training, and testing materials to ensure that the local needs of the fire and emergency service agencies and providers are met. The Division of Fire Safety is your partner in safety and training, and we stand behind you on every call you will respond to throughout your career.

HOW TO USE THIS ADDENDUM

This manual is provided to firefighters entering the New Jersey fire and emergency services system to become familiar with the state government organizations and departments, and state standards and regulations that are important to firefighters. This addendum serves as a supplement to The Firefighter's Handbook in providing firefighters with a well-rounded and basic introduction to firefighting in the State of New Jersey.

The best use of this addendum is to read and study the material, and then do some exploration on your own to expand your learning. The addendum provides other resources, including websites, where you can find further information about a variety of topics. Use these resources to answer the questions you have while reading through the material, and to examine more closely the subjects covered in the addendum, Figure A-2.



Figure A-2 The Fire Instructor is the first link in Firefighter Safety.

Firefighters know that continuous training and learning are what keeps them safe and most effective at emergency incidents.

For this reason, it is important that you make a commitment to lifelong learning as you enter the fire service. Keep this addendum with your notes and refer to them occasionally after your initial training. Add information about changing state regulations or state resources as these become available. Talk to others in your department about these changes, and make learning a team effort in the fire service. Remember, you and you alone have the ability to build your personal knowledge, skills, and abilities into a superior asset.

NEW JERSEY FIRE AND EMERGENCY SERVICE RESOURCES

SECTION B

Outline

- New Jersey Government
- New Jersey Division of Fire Safety
- Other State Resources

Objectives

- Other State Resources
- New Jersey Division of Fire Safety
- Describe the responsibilities of the Division of Fire Safety
- Explain the relationship between Departments and Agencies of the State of New Jersey
- Explain the responsibilities of the various bureaus and units within the Division of Fire Safety
- Describe who enforces the Uniform Fire Code in municipalities
- Describe the make-up of the membership of the Fire Safety Commission
- List and explain the three co-equal branches of the State of New Jersey government

NEW JERSEY GOVERNMENT

The government of the State of New Jersey, like that of the United States, is divided into three coequal branches: the legislative, the executive, and the judicial. The principal function of the Legislature is to enact laws. The Executive Branch (the Governor and State agencies) carries out the programs established by law. The

Judiciary (the Supreme Court and lower courts) punishes violators, settles controversies and disputes, and is the final authority on the meaning and constitutionality of laws.

There are a variety of departments and agencies that comprise the State Government, Figure B-1.

More information about the State and Local governments of New Jersey and the departments and agencies that make up state government can be found at <http://www.nj.gov>

NEW JERSEY DIVISION OF FIRE SAFETY

Within the New Jersey Department of Community Affairs is the Division of Fire Safety. The Division of Fire Safety is the central fire service agency in the State, responsible for the development and enforcement of the State Uniform Fire Code, public education programs, Figure B-2. The Division of Fire Safety includes two bureaus: the Bureau of Fire Code Enforcement and the Bureau of Fire Department Services.

The following section outlines the various programs of the Division of Fire Safety and

SECTION B

New Jersey State Government Departments and Agencies	
Departments	Agencies
Agriculture	Administrative Law, Office of
Banking & Insurance	Board of Public Utilities
Commerce	Building Authority
Community Affairs	Casino Control Commission
Corrections	Clean Air Council
Education	Cancer Research, Commission on
Environmental Protection	Commission on Higher Education
Health & Senior Services	Commission on Science and Technology
Human Services	Council on Local Mandates
Labor	Delaware River Basin Commission
Law & Public Safety	Economic Development Authority
Military & Veterans Affairs	Election Law Enforcement (Campaign and Lobbying Disclosure)
Personnel	Executive Commission on Ethical Standards
State	Garden State Preservation Trust
Transportation	Governor's Council on Alcoholism and Drug Abuse
Treasury	Health Care Facilities Financing Authority
	Higher Education Student Assistance Authority
	Homeland Security
	Housing and Mortgage Finance Agency
	Information Technology
	Interstate Environmental Commission
	Lottery
	Motor Vehicle Commission
	New Jersey Meadowlands Commission
	New Jersey Network (NJN)
	New Jersey Redevelopment Authority (NJRA)
	New Jersey School Construction Corporation
	New Jersey Transit

Figure B-1 New Jersey state government departments and agencies.

their purposes and functions. For further information regarding the Division of Fire Safety's programs, please visit the web site at <http://www.nj.gov/dca/dfs> and click on Bureaus and Offices.

The mailing address for the Division of Fire Safety is: New Jersey Department of Community Affairs, Division of Fire Safety, PO Box 809, Trenton, NJ 08625-0809.



Figure B-2 The Division of Fire Safety oversees a variety of programs, including training programs for firefighters.

Division of Fire Safety Programs

Fire Safety Commission

Type of Assistance: Advisory.

Description: Works closely with the Division of Fire Safety to promote fire safety in the State. The commission comprises 23 members, including state legislators and citizens with expertise or interest in fire safety. It was created by law to assist and advise the Commissioner of the Department of Community Affairs on all matters of fire safety.

Assistance Provided To: State government, the fire service and the general public.

Other Information: Meets five times each year to consider fire safety issues, amendments to the Uniform Fire Code, new fire safety programs and to hear comments from the public on matters of fire safety.

Legislative and Regulatory Services

Type of Assistance: Technical and Advisory.

Description: Provides guidance regarding local enforcement of the Uniform Fire Code Safety Act and State Fire Prevention Code; oversees local agency operations and

conducts routine monitoring, develops and amends program rules, provides assistance to Peer Review Committee to assess sanctions against certified officials, undertakes appropriate corrective or enforcement action for violations of the Act and Code, maintains quarterly registry of agencies having jurisdiction within each municipality in the State.

Assistance Provided To: Municipalities, fire services or private individuals.

Volunteer Emergency Service Organization Loan Program

Type of Assistance: Financial—Loans.

Description: Provides loans to fire departments and ambulance/rescue squads.

Funding Source: State Appropriation, Special Revenue.

Award Period: July 1 to June 30.

Assistance Provided To: Volunteer and partially-paid fire companies, first aid squads and rescue squads.

Other Information: Two percent interest, 10-year repayment, maximum loan: \$50,000.

Procedure for Applying: Request for proposals mailed annually. Submission of an application.

Volunteer Recruitment and Retention Program

Type of Assistance: Advisory and Programmatic.

Description: Provides guidance, visual aids and assistance to local volunteer and combination fire departments and first aid, ambulance and rescue squads trying to recruit new members and retain current members.

Assistance Provided To: Volunteer and Combination fire departments, first aid, ambulance and rescue squads.

Bureau of Fire Code Enforcement Programs

Fire Code Services

Type of Assistance: Technical and Advisory.

Description: Provides technical assistance to fire officials/fire inspectors involved in the enforcement of the Uniform Fire Code and Regulations for Fire Code Enforcement.

Assistance Provided To: Local enforcing agencies and private individuals.

Inspections

Type of Assistance: Technical.

Description: Enforces the Uniform Fire Code in municipalities that do not elect to establish local enforcement agencies; responsible for the inspection of high-rise and life hazard use buildings/structures when the Department has retained direct enforcement authority, Figure B-3.

Assistance Provided To: Any municipality that has not established an enforcement agency for the Uniform Fire Code.



Figure B-3: Local Fire Prevention Bureaus can request assistance from the Division of Fire Safety Bureau of Code Enforcement.

Life Hazard Use Registration

Type of Assistance: Technical and Advisory.

Description: Life hazard use is defined as the use of a building or structure that may constitute a potential risk to human life, public welfare or firefighters. The program registers high-rise and life hazard use buildings/businesses to inspect and enforce the Uniform Fire Safety Act. Records of these structures are maintained and lists are distributed to local enforcement agencies. The program collects fees from life hazard use owners and establishes criteria to disburse funds to local agencies enforcing the Uniform Fire Code and Regulations.

Assistance Provided To: Any fire service, local enforcement agency or individual.

Local Assistance

Type of Assistance: Technical.

Description: Assists municipalities to establish local enforcing agencies in accordance with the Uniform Fire Safety Act; makes recommendations to the local enforcing agencies regarding daily operations; provides interpretations of the Uniform Fire Code. **Assistance Provided To:** Municipalities and local enforcing agencies.

State Building Fire Safety Inspections

Type of Assistance: Technical.

Description: Supervises fire prevention and protection programs in all state owned, state leased and state occupied structures.

Assistance Provided To: Mandatory for all state-owned or state-leased properties.

Bureau of Fire Department Services Programs

Fire Coordinator's Program

Type of Assistance: Technical.

Description: Administers the New Jersey Fire Coordinator System. This system is part of the State's emergency management system and manages the deployment of fire service resources requested beyond contiguous municipalities. There is a County Fire Coordinator assigned to each of the State's 21 counties.

The system is designed to deploy Division staff to the Emergency Operations Center at State Police Headquarters in West Trenton. From there, Division staff coordinates the deployment of fire service resources, particularly during a declared state of emergency.

County fire coordinators are responsible for maintaining resource lists, including

apparatus, specialized equipment, and available staffing, and working with the Division staff to have them readily available.

Fire Department Programs

Type of Assistance: Technical and Advisory.

Description: Investigates serious injuries or deaths of firefighters in the line of duty and publishes the findings in a formal report. Additionally, this unit works with the Juvenile Firesetter Committee to research and develop a statewide policy for preventing juveniles from setting fires and for educating the public and the fire service about the problem.

Other Information: In cooperation with the Department of Treasury, the program develops specifications for firefighters' protective clothing and equipment for inclusion on the State Cooperative Purchasing Contract. This ensures that protective clothing meets the standards established in the Public Employees Occupational Safety and Health Act.

Assistance Provided To: Fire service organizations, emergency medical services, state, county or municipal governments and anyone dealing with the problems of a juvenile firesetter.

Fire Incident Reporting System

Type of Assistance: Technical.

Description: Administers a statewide fire incident reporting system that also serves as a central depository for the National Fire Incident Reporting System. Participating fire departments report emergency incidents in a standardized format that is passed on to the U.S. Fire Administration to be included in national statistics and analyses. The unit also analyzes statewide data to identify trends and publishes an annual report titled "Fire in New Jersey."

Assistance Provided To: Any fire service organization or interested individual.



Figure B-4 The Fire Instructor has various forms of media available along with support from the Division of Fire Safety, to provide training

Fire Protection Installers/ Maintenance Certification Program

Type of Assistance: Technical and Advisory.

Description: Establishes a comprehensive, mandatory licensing procedure for contractors who sell, install, repair, inspect and maintain fire protection equipment. Determines whether an application is complete and if all requirements have been met. The appropriate license is issued to the applicant in each field for which the qualifications are met.

Other Information: Currently, there are six license classifications established within this program: Fire Protection Equipment; Fire Sprinkler System; Special Hazard Fire Suppression System; Fire Alarm Equipment; Portable Fire Extinguisher; and Kitchen Fire Suppression System. Businesses that provide any type of service on fire safety equipment must obtain an annual business permit.

Office of Training and Certification

Type of Assistance: Technical, Advisory and Training.

Description: Provides statewide educational and training programs relating to fire protection, fire prevention, fire safety inspection, and to certify fire officials/fire inspectors who enforce the Uniform Fire Code. The office also develops training standards for various positions within the fire service and provides training programs leading to certification in those positions. Continuing education programs are also available to individuals holding certain certifications. This program also offers National Fire Academy Training courses covering all aspects of firefighting.

Assistance Provided To: Fire service training academies, any fire service organization or private individual.

People with Disabilities or Oxygen Use Emblem Program

Type of Assistance: Technical.

Description: Issues a person with a disability or who uses oxygen one of two identification emblems. The disability emblem is affixed to a window of a residential dwelling and alerts firefighters, medical, rescue or law enforcement personnel, when responding to an emergency situation, that a person with a



Figure B-5 The Bureau of Fire Department Services offers public education assistance and materials.

disability may be present therein and may require special assistance. The oxygen emblem is also affixed to a window of a residential dwelling to warn firefighters that oxygen is in use within that dwelling. A person with a disability or who uses oxygen may apply for an emblem by contacting the Division.

Public Education

Type of Assistance: Technical and Advisory.

Description: Increases public awareness of fire safety by developing educational fire

safety materials such as brochures, flyers, posters and booklets for distribution to schools, fire departments and the general public; develops specific fire safety programs for schools, preschools and senior citizens, Figure B-5; publishes a newsletter for members of the fire service and other individuals and organizations interested in fire safety; and helps coordinate an annual fire safety poster contest for school children throughout the State.

Assistance Provided To: Municipalities, schools, fire departments and the general public.

Other State Resources

There are a variety of other state resources that may be beneficial to firefighters. Below is a partial listing of some of these resources.

New Jersey Department of Community Affairs, Division of Codes and Standards

<http://www.state.nj.us/dca/codes/>

New Jersey Department of Health and Senior Services, Office of Emergency Medical Services,<http://www.state.nj.us/health/ems/index.html>

New Jersey Department of Law and Public Safety, Division of Highway Traffic Safety<http://www.state.nj.us/lps/hts/index.html>

New Jersey Department of Law and Public Safety, Office of Counter-Terrorism

<http://www.state.nj.us/lps/oct/index.html>

New Jersey Department of Labor & Workforce Development,

<http://www.nj.gov/labor/Isse/Ispeosh.html>

New Jersey Homeland Security

<http://njhomelandsecurity.gov/>

REVIEW QUESTIONS

1. Describe the main responsibilities of the Division of Fire Safety.
2. Review the list of the departments and agencies within the State of New Jersey government.
3. What are the names of the two bureaus within the Division of Fire Safety?
4. Which bureau is responsible for the Fire Incident Reporting System and Office of Training and Certification?
5. What are the main responsibilities of the Department of Community Affairs Fire Safety Commission?
6. Name the co-equal branches of the New Jersey State government.
7. Enacting laws are the principal function of which branch of government?
8. Which branch of government has the principal function of carrying out the programs established by law?
9. The final authority on the meaning and constitutionality of law is the principal function of this branch of government.
10. What does the Bureau within the Division of Fire Safety investigate, serious firefighter injuries or fatalities? Why is this important component of firefighter safety and survival?

NEW JERSEY FIRE SERVICE STANDARDS AND REGULATIONS

SECTION C

OUTLINE

- Public Employees Occupational Safety and Health Act (PEOSHA) Standard
- Firefighter Safety
- Accountability
- Emergency Lights
- Public Employees Occupational Safety and Health Program Bloodborne Pathogens
- Hazard Communication Standard

OBJECTIVES

- Explain the difference between federal and state regulations concerning occupational safety and health of government employees.
- Describe the protective clothing that firefighters wear and its limitations.
- Explain what a pathogen is and how it can threaten the health of firefighters.
- Describe how a fire department's accountability system is used to track the whereabouts of all firefighters at an incident.
- Describe how a Personal Alert Safety System (PASS) works and the importance of using this type of equipment.
- Explain the significant differences between the new Hazard Communication Standard and the Worker and Community Right-to-Know Act.
- Explain why there are so many regulations concerning firefighting and the operation of fire departments.
- Explain the Firefighter Safety Regulations and the importance of properly utilizing these standards.

PUBLIC EMPLOYEES OCCUPATIONAL SAFETY AND HEALTH ACT

In 1970, the Williams-Steiger Occupational Health and Safety Act was passed by Congress. It required the adoption of occupational safety and health standards for employees. This act, known by its acronym OSHA, has been applied nationwide to all private employers and employees. State and local public employees were not covered by this Act.

In 1984, the New Jersey State Legislature enacted the Public Employees Occupational Safety and Health Act (PEOSHA) to establish safety and health standards for state and local public employees. A copy of this Act is provided as Appendix I of this addendum. The PEOSHA Act requires that standards adopted in New Jersey must be at least as effective as the ones contained



Figure C-1. Fire officer conducts equipment check of a firefighter's personal protective equipment".

in the federal OSHA law and regulations to provide safe and healthful employment conditions and places of employment.

In order to implement PEOSHA, regulations establishing these standards (the standards in the Federal OSHA law and regulations) were adopted in 1984. In 1992, 1994, and 1998, the New Jersey Department of Labor adopted additional PEOSHA regulations that describe updated standards for protective clothing for the fire service, Figure C-1, New Jersey's regulations are different than the Federal OSHA regulations for fire protective clothing only. These state regulations include many new standards, including requirements for protective hoods, aerial ladder testing, and the adoption of the OSHA Respiratory Protection Standard 29 CFR 1910-134.

There are various compliance dates in these new regulations. Some call for eventual compliance with the new standards based on replacing existing equipment when it wears out rather than disposing of existing equipment. Others require compliance by a particular date. Each is discussed in detail, like earlier PEOSHA regulations, the 1992, 1994, and 1998 regulations apply to:

1. "The State, or any department, division, bureau, board, council, agency or authority of the State, except any bi-state agency"



Figure C-1.1. The New Jersey Department of Labor adopted additional PEOSHA regulations that describe up-dated standards for protective clothing for the fire service.

2. "Any county, municipality, or any department, division, bureau, board, council, agency or authority of any county or municipality, or of any school district or special purpose district created pursuant to law."

What Standards Apply to Firefighters?

Certain sections of the PEOSHA regulations apply only to firefighters. These are the regulations setting standards for fire protective clothing and equipment, and may be found in the regulations of the New Jersey Department of Labor. These regulations may be cited as N.J.A.C. 12:100-10 et seq. A copy of these regulations is included as Appendix II of this addendum.

All PEOSHA regulations relevant to the fire service apply to volunteer, paid, and combination firefighters. In some cases, implementation details are different for career and volunteer firefighters, although PEOSHA regulations do cover volunteers.

How Regulations Are Enforced

The New Jersey Department of Labor enforces these regulations, except for the provisions related to respiratory protective equipment. The state Labor Department enforces all matters related to protective clothing and equipment.

The New Jersey Department of Health enforces the parts of this regulation related to respiratory protective equipment. The state Health Department also enforces PEOSHA regulations related to hazardous materials.

The New Jersey Department of Community Affairs (DCA) is responsible for all matters related to building safety under the Uniform Construction Code or Fire Safety under the Uniform Fire Safety Code. DCA does not enforce regulations or standards related to protective clothing for firefighters. However, DCA maintains information on these standards and works with the New Jersey Department of Treasury to update the state contract for protective clothing.

Any employees or employee representatives who believe that a violation of these regulations or imminent danger exists should notify their employer immediately. They may also contact the State and request an inspection. Firefighters can use the previous explanation as a guideline to which agency should be contacted. When in doubt, contact the New Jersey Department of Labor.

Requests for inspections must be in writing and must describe the violation or danger that is believed to exist. While such letters must be signed by the employee or employee representative to be acted upon, the State must withhold the name of anyone who requests an inspection if that person asks that his or her name be withheld.

Once contacted, the relevant state agency must perform an inspection at the earliest date possible. At this inspection, the employee who requested the inspection, a representative of the employer, and a representative of the employee are allowed to accompany the inspector to aid the inspection. Employees who participate in such inspection must receive normal pay for the time on the inspection.

Notices of violation and recommendations for improvements will be provided to the employer by the relevant State agency (Labor, Health, or Community Affairs) after the inspection. In most cases, the agency that performed the inspection will communicate with the employer. In the case of hazardous material inspections, however, the Department of Health will perform the inspection, but notices of violation, if any, will come from the Department of Labor, on the report of the Department of Health. Inspection reports and notices calling for corrections are generally sent to the mayor of a municipality or the board of a fire district, with copies provided to the chief of the fire department.

Scope and Standards Information

These regulations apply to both career and volunteer members of the fire service. For purposes related to PEOSHA, use of the term "public employee" does not depend on whether or not the employee is paid. In some cases, different implementation details are set for career and volunteer members of the fire service, but the PEOSHA Act and regulations fully apply to career and volunteer firefighters.

These regulations are applicable to all firefighters. A "firefighter" is a public employee who engages in the physical activity of rescue, fire suppression, or both in buildings, enclosed structures, vehicles, vessels, or like properties that are involved in a fire or emergency situation. These regulations are not intended for those employed in the industries of construction, maritime, agriculture, airport crash rescue, or forest firefighting.

The protective clothing mandated by this regulation must be provided to all firefighters who participate in interior structural firefighting and overhaul. Interior structural firefighting is the physical activity of fire suppression, rescue, or both, which is conducted inside buildings or enclosed structures, after the incipient stage of the fire. Overhaul is the final control of a fire, with suppression of the main body of the fire and other pockets of fire, while searching for victims and performing salvage operations.

Organization Information

Employers must prepare a written description of:

1. The organizational structure of the fire department;
2. The expected number of members of the fire department;

3. The functions the fire department is expected to perform.

This document must be available for inspection by:

1. Employees
2. Their designated representatives (for example, labor unions); and
3. The New Jersey Department of Labor.

Physical Ability and Disability

The employer must assure that employees who are expected to fight interior structural fires are physically capable to do this work. The employer must make this determination in a way that is compatible with the Americans with Disabilities Act (ADA) of 1990, a federal law governing certain disability issues.

The details of ADA are beyond the scope of this document. For further information on ADA issues, and reviews of the Act. Discussions with legal advisors or both may be necessary.

Protective Clothing Requirements and Deadlines

Protective clothing must protect the:

1. Head, including face and eyes;
2. Body; and
3. Extremities (arms, legs, feet, and hands), see Figure C-2.

Employers must provide, at no cost to the employee, the protective clothing described in this regulation. The relationship between this mandate and any contracted clothing allowance must be agreed upon through collective bargaining between employers and employees. Employees who perform interior structural firefighting and overhaul must be provided with this equipment.

This law calls for cooperation from both employers and employees. Employers must assure that employees wear the protective clothing, use the safety equipment, and follow safety procedures. Employees must wear the required protective clothing, use the required equipment, and follow safety procedures at the time and in the ways specified by the law and their employer. The responsibility of wearing turnout gear and other PPE provided by the employer at emergency incidents rests squarely on the shoulders of the individual firefighter. An inherent culture existing

in the fire service supports a casual attitude toward the proper and effective use of PPE at all emergency incidents. New firefighters coming into the New Jersey Fire Service must change this by adopting a "no exceptions" rule when it comes to properly wearing their assigned personal protective equipment to protect their health and safety and that of their team members.

For the most part, these regulations call for the eventual replacement of current equipment with new equipment that complies with more stringent standards. However, career firefighters must wear protective coats, pants, station uniforms, and boots that comply with these new standards.

Firefighters must remember that meeting standards for protection or resistance to certain substances or forces does not mean that a product will protect a firefighter from every possible condition experienced in the line of duty or that exceeds the tests performed.

Exposure to conditions that exceed the product's tested performance can lead to serious injury or death.

Foot and Leg Protection

New boots must comply with NFPA 1974-1987, "Protective Footwear for Structural Fire Fighting."



Figure C-2. A firefighter's structural firefighting ensemble.

Structural Firefighting PPE Ensemble Components	
▪ Helmet	▪ Hood
▪ Goggles	▪ Radio
▪ SCBA	▪ Flashlight
▪ Coat	▪ PASS Device
▪ Pants	▪ Pocket tools
▪ Boots	▪ Gloves

This standard is the 1987 edition of NFPA standard number 1974.

Footwear that meets the NFPA standard will bear a label or stamp specifically stating that it complies with NFPA 1974-1987. Only boots with such a label will be considered to comply with the law.

The standard requires that boots will be at least 8 inches high, water resistant with a puncture-resistant sole, a ladder shank, and an impact and compression-resistant toe cap. There are several options for footwear available to firefighters, see figure C-3, C-4, C-5.

Boots must also meet standards for resistance to heat, corrosion, punctures, electricity, impact and compression, flame, abrasion, wear, and water. The details of these technical standards can be found in the NFPA text, along with information on testing methods.

Compliance Deadlines: Career firefighters must wear boots and bunker pants that comply with the standard at this time.

Volunteer firefighters must wear boots and bunker pants that comply with the standard when their current boots are next replaced or when they are worn out, whichever comes first.



Figure C-3. Common Rubber Boot

- Easy to don
- Excellent Water Repellency
- Easy Decontamination
- Inexpensive
- Sloppy Fit



Figure C-4. Leather Pull-Up Boot

- Lightweight
- Curable
- Comfortable
- Minimal Ankle Support
- Difficult to Decon
- Expensive



Figure C-5. Leather Lace-Up Boot

- Tight Fit
- Ankle Support
- Durable
- Expensive
- Height Decreases Water Resistance
- Difficult to Decon

Body Protection

This section covers both turnout (or bunker) gear and station uniforms.

Turnout Gear: Turnout gear must comply with NFPA 1971-1986, "Protective Clothing for Structural Fire Fighting." This is the 1986 edition of NFPA standard number 1971. Turnout gear includes both a protective coat and protective pants.

Turnout gear that meets the NFPA standard will bear a label specifically stating that it fully complies with NFPA 1971-1986, Figure C-6. Only coats and pants with such a label will be considered to comply with the law.

The NFPA standard for turnout gear includes tests for thermal protection; thermal shrinkage; heat, char, and ignition resistance; tear resistance; and retro-reflectivity.

The protective coat is designed to protect the upper torso, neck, arms, and wrists. It must be composed of three layers: outer shell, moisture barrier, and thermal barrier.

Because it will be worn with protective trousers, the new standard protective coat may be shorter than coats used in the past. To protect the neck, a collar at least 4 inches wide and containing at least the same three layers as the body of the coat must be part of the coat. Coats must also contain wristlets that meet the same performance standards as the body of the coat.

High visibility safety trim must be included on the protective coat. This trim must be at least 2 inches wide and have both retro-reflective and fluorescent surfaces. Each coat must have a continuous band of fluorescent and retro-reflective material, at least 2 inches wide, around the coat, as well as a similar band at least 2 inches wide around each wrist. Each coat must have at least 325 square inches of fluorescent trim. Retro-reflective surfaces must be at least 0.625 inches wide.

Protective pants, also known as bunker pants are required. These are designed to protect the lower torso and legs (excluding the ankles and feet). Like the protective coat, protective pants must be composed of three layers: outer shell, moisture barrier, and thermal barrier.

Bands of the same high visibility trim used on the protective coat must be placed between



Figure C-6. Interior label indicating turnout gear complies with NFPA 1971-1986

the bottom hem and the knee of each leg of the pants. Protective trouser trim must include at least 80 square inches of fluorescent surface area.

For career firefighters, these protective garments must be worn in conjunction with a station uniform that complies with the regulations.

Career firefighters must wear protective coats and pants that meet the standard at this time.

Volunteer firefighters must be provided and wear protective coats and pants that comply with the new standard when their current coats are no longer serviceable.

Volunteer firefighters must wear protective pants when they wear the shorter boots.

Station Uniforms: Station uniforms may comply with NFPA 1975-1985, "Station/Work Uniforms for Fire Fighters," or be made of a nonmeltable material, such as cotton. Station uniforms include a shirt and pants. Station gear that meets the NFPA standard will bear a label or stamp specifically stating that it fully complies with NFPA 1975-1985. State PEOSHA regulations do not require station uniforms that comply with this NFPA standard. Station uniforms are not meant to take the place of turnout gear. Career firefighters must wear station uniforms that comply with this regulation at this time. Station uniforms are not required for volunteers.

In 2007, the National Fire Protection Association (NFPA) adopted a revised standard on station wear and work uniforms titled "Station/Work Uniforms for Emergency Services." Unfortunately, as of February 2010 the New Jersey Department of Labor has not yet

adopted this revised standard. According to PEOSHA representatives the new standard may be cited during an inspection and/or investigation. However, they will continue to utilize the prior standard covering station uniforms and personal protective equipment documented in this section to determine violations of their regulations.

Hand Protection

Gloves must comply with NFPA 1973-1988, *Gloves for Structural Fire Fighting*. This standard is the 1988 edition of NFPA standard number 1973.

Gloves that meet the NFPA standard will bear a label inside each glove specifically stating that it fully complies with NFPA 1973-1988. Only gloves with such a label will be considered to comply with the law.

Compliant gloves are designed to minimize the effects of flame, heat, sharp objects, and other hazards associated with structural firefighting. Gloves must provide complete and secure thermal and moisture protection, and are designed to interfere as little as possible with movement and dexterity.

Gloves must extend at least 1 inch above the wrist, and must also contain a secure wristlet to prevent the entry of embers and other matter.

There are specific sizing criteria in the NFPA standard to ensure uniformity of hand measurement and sizing. These criteria are included in the standard.

Gloves must comply with the standard at this time.

Head, Eye, and Face Protection (Helmets and Protective Hoods)

Helmets must comply either with the existing OSHA standard for helmets, found in Federal regulations at 29 CFR Part 1910.156(00), or NFPA 1972-1987, "Helmets for Structural Fire Fighting." The 1994 State PEOSHA regulation continues to approve of the current OSHA standard helmet and adds the NFPA-standard helmet as an alternative. Protective hoods must comply with NFPA 1971-1991. "Protective Clothing for Structural Fire Fighting."

Helmets must protect the head, eyes, and face, and must include earflaps and a chinstrap, Figure C-7.

Helmets that meet the NEPA standard will bear a label specifically stating that it fully complies with NFPA 1972-1987. Helmets that comply with the OSHA standard will also bear a label specifically stating that it complies with the appropriate OSHA standard. Only helmets bearing one of these labels will be considered to comply with the law.

The NFPA performance requirements for helmets cover protection from impact, penetration, heat, flame, and electricity. Ancillary features such as the chinstrap, ear covers, face shield, and retroreflective markings are also designed to meet NFPA criteria, although the criteria and testing are not necessarily identical to those for the body of the helmet.

Face shields, Figure C-8, that comply with the standards will bear a label stating compliance with the requirements of 29 CFR 1910.134. The label will also point out that users may still require additional eye protection.

Protective hoods must protect areas of the head and neck excluding the face, which is normally protected by the SCBA facepiece. Protective hoods meeting the NFPA standard will bear a label specifically stating that it fully complies with NFPA 1971-1991.

This regulation allows the use of helmets that comply with the existing OSHA standard, and allows the use of the NFPA helmet standard as an alternative. Helmets must comply with this regulation at this time.

Protective hoods must be provided and worn at this time unless the hood interferes with the proper fit of the firefighter's helmet. If this is the case, a hood shall be provided at such time as the helmet becomes unserviceable and is replaced.

In 2007, the National Fire Protection Association (NFPA) adopted a new protective clothing standard titled "Protective Ensembles for Structural Fire Fighting and Proximity Fire Fighting" (NFPA 1971-2007). This revised standard regulates the identical components of the prior standard such as, structural firefighting PPE, foot and leg protection, head protection, along with hand and head protection. However, some major safety related additions/revisions to this standard were adopted by the NFPA. These new sections include standards on the testing of the materials used to construct PPE, the inclusion of safety features such as a drag rescue device (DRD) within each individual set of PPE, and an

optional CBERN (Chemical Biological, Explosive, Radiological and Nuclear) section that allows departments who may respond to terrorist incidents the opportunity to purchase PPE that will afford their members enhanced protection against certain CBERN agents.



Figure C-7. Helmets must include a chinstrap.

Unfortunately, as of February 2010, the New Jersey Department of Labor has not yet adopted these revised standard. According to PEOSHA representatives, the new standard may be cited during inspection and/or investigation. However, they will continue to utilize the prior standard covering PPE documented in this section when conducting inspections and/or investigations.



Figure C-8. A face shield and earflaps are required on a helmet.

Respiratory Protection Devices

Respiratory protection equipment must comply with 29 CFR 1910.134 and NFPA 1981-1987, "Open-Circuit Self-Contained Breathing Apparatus for Firefighters." This is the 1987 edition of NFPA standard number 1981.

Employers must establish and maintain a respiratory protection program complying with 29 CFR 1910.134. This OSHA standard has been adopted by PEOSHA in its entirety.

Respiratory protection equipment that complies with the NFPA standard will bear a label specifically stating that it complies with NFPA 1981. Only equipment that bears such a label will be considered to comply with the law.

To bear the NFPA label, the National Institute of Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration must certify this equipment. These organizations require that the equipment weigh no more than 35 pounds and carry at least a 30-minute supply of air.

Respiratory protection equipment must be of the open circulation type, which means that exhaled air is expelled from the equipment and not reused in any way.

There are two types of open circulation systems, positive pressure and negative pressure. Only positive pressure open circulation systems comply with the NFPA standard. Devices that operate in positive pressure mode but can be switched to negative pressure mode do not meet the standard.

No respiratory protection equipment that has been approved by the Bureau of Mines complies with the NFPA standard, regardless of any grandfather provision or statement to the contrary by any government or private group.

Respiratory protection equipment must meet standards for airflow as well as resistance to heat, vibration and shock, flame, corrosion, dust, facepiece lens abrasion, and voice communication.

Respiratory protection equipment ordered or purchased after January 1 1993, must comply with the NFPA standard. Existing respirators that comply with the previous

OSHA standards may be worn until they are unserviceable under certain conditions. Specifically, these respirators may be used with approved air cylinders from other approved systems as long as they are of the same capacity and pressure rating. Existing respirators that are switchable from demand to positive pressure mode must be used in positive pressure mode during all firefighting and overhaul work.

Career and volunteer firefighters must be provided with compliant respiratory protection equipment upon the next replacement of current equipment.

Life-Safety Rope, Harness, and Hardware

Life-safety rope, harnesses, and hardware must comply with NFPA 1983-1985. This standard is the 1985 edition of NFPA standards number 1983.

This equipment need only be provided in those departments that train and perform rope rescue services.

Life-safety rope that meets the NFPA standard will bear a label specifically stating that it complies with NFPA 1983, it will also contain an identification tape wound into the full length of the rope bearing the same statement.

Only life-safety ropes with both the label and the tape will be considered to comply with the law. Rope with a tape but without a label should, not be used for rescue purposes, because removal of the label is one way of marking rope that is no longer suitable for rescue work.

Life-safety rope must be of block creel construction, which means that lengths are made without knots or splices.

Life-safety rope that has been previously used for rescue or non-rescue purposes should be destroyed or removed from use for rescue purposes. Failure to observe this recommendation could lead to serious injury or death because no acceptable means of testing used rope exists.

Life-safety rope is available in two classes—one person rope and two person rope. Ropes that comply with the law will bear a label identifying whether it is one or two person rope. One-person rope is designed with a maximum working load of

at least 300 pounds and a tensile strength of at least 4,500 pounds.

In contrast, two-person rope is designed with a maximum working load of at least 600 pounds and a tensile strength of at least 9,000 pounds.

Life-safety rope, harness, and hardware must comply with this standard at this time.

Life-Safety Harnesses: Life-safety harnesses meeting the NFPA standard will bear a cloth label or a riveted metal tag stating that it complies with NFPA 1983. Only harnesses with such a label or tag will be considered to comply with the law.

Webbing for these harnesses must be constructed of virgin, continuous fibers and be at



Figure C-9. A Class I harness is secured only around the waist.

least 1-3/4 inches wide. Webbing, structural stitching, and rivets are designed and tested to meet and exceed their intended use situations.

Harnesses are designated as being from one of three classes. Class I harnesses fasten around the waist, Figure C-9. They are designed to secure one person to a ladder or to bear the weight of one person in an emergency rescue. Class I harnesses, should not be worn by firefighters during efforts to rescue another person.

Class II harnesses, are worn around the waist and around the thighs or under the buttocks, Figure C-10. They are designed for use in rescue situations where two-person loads (e.g., one firefighter and one victim) may be encountered.

Class III harnesses, are fastened around the waist, around the thighs or under the buttocks, and over the shoulders, Figure C-11. They are designed for rescue situations where a two-person load and inverting may be encountered.

Life-Safety Hardware: There is no NFPA label applied to life-safety hardware, but load-bearing hardware will carry the name of the manufacturer and the MIL-SPEC number, if applicable.



Figure C-10. A Class II Harness is secured around the waist and thighs.

All hardware must be able to withstand corrosion in a laboratory salt spray test. In addition, all load-bearing hardware, buckles, rings, snap-links, ascent devices, and descent devices are tested to withstand forces that match and exceed expected use conditions. Snap-link gates, which are load-bearing, gated fasteners, must lock automatically. Recently, many fire departments have begun to purchase personal safety harnesses and personal escape devices for individual firefighters.



Figure C-11. A Class III harness.

These life saving units are designed to allow firefighters the capability to safely and rapidly remove themselves from an IDLH atmosphere should an emergency event occur. While these devices are not mandatory, the proactive manner by which individual departments are assuming the responsibility of enhancing firefighter safety through these purchases should be commended.

Personal Alert Safety System (PASS)

Personal Alert Safety System (PASS) devices must comply with NFPA 1982-1988. This is the 1988 edition of NFPA standard number 1982. However, devices that comply with the 1983 edition of this standard, NFPA 1982-1983, may continue in use until they become unserviceable.

PASS devices are motion-detector-based devices, worn by individual firefighters, that emit an alarm when a firefighter has not moved in approximately 30 seconds. The purpose of a PASS is to alert other firefighters that the wearer may be unable to move and may be in need of assistance. They must be worn by firefighters in the following situations:

- While engaging in interior structural firefighting
- While working in confined spaces; and
- During all phases of overhaul.

The PASS device shall be attached to the exterior of the firefighter's turnout gear.

PASS devices that meet the NFPA standard will bear a label specifically stating that it fully complies with NFPA Standard 1882. There are 1988 and 1983 editions of this standard, and an explanation of which edition of the standard must be met is provided under "Compliance Deadlines."



Figure C-12. Various types of PASS Devices are available. Including those that are integrated with SCBA

Only devices with labels specifically mentioning the appropriate standard will be considered to comply with the law.

PASS devices emit an alarm sound when the firefighter has not moved for approximately 30 seconds, or when the firefighter manually operates the alarm switch, Figure C-12. They are battery-powered devices, weighing no more than 16 ounces, which can be attached to a firefighter's SCBA gear or elsewhere.

PASS devices are designed to be operated in three modes—automatic, manual, and off. In automatic mode, the motion detector will activate a pre-alarm warning after approximately 30 seconds of no motion by the wearer. This warning sound will be distinct from the alarm sound. Motion sensed after the pre-alarm warning sound will return the device to automatic mode. Under normal operating conditions, the device will be able to sound its alarm for at least one hour.

- When the wearer or operator switches the device to manual mode, the alarm will sound within one second.

- In the off mode, the device does not function and there is no drain on battery power.
- The switch used to change modes must be operable by a hand wearing a heavy glove.

Turning the switch to the off position requires two distinct motions to limit the possibility of accidental shutoff.

The device must also emit a low battery warning sound when the battery is drained to the point it would be unable to sustain a full alarm sound for one hour. The low battery warning is distinct from other sounds emitted by the device.

A career or volunteer firefighter who does not currently have any PASS device must wear a PASS device that complies with NFPA 1882-1988. A career or volunteer firefighter who has a PASS that does not comply with any edition of NFPA Standard Number 1882 must have a device that complies with NFPA 1882-1988 by January 4, 1994.

A career or volunteer firefighter whose current PASS complies with the 1983 edition of the NFPA standard (NFPA 1882-1983) must be issued a device that complies with the 1988 edition of the standard (NFPA 1882-1988) upon replacement of the current device.

Many fire departments have begun to use Integrated PASS units which provide PASS devices and SCBA in the same appliance. This application meets the previous intent of regulation so long as the Integrated PASS unit meets all the previously stated requirements and is worn, not only while engaged in interior structural firefighting, but while working in a

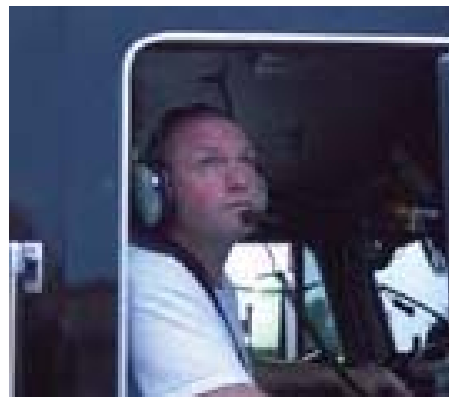


Figure C-13 Apparatus headsets provide hearing protection for firefighters.

confined space, during all phases of overhaul, and whenever there is a possibility that the previously mentioned actions could occur.

Hearing Protection

PEOSHA hearing protection standards do not apply to working in emergency situations. They apply only to the use of power tools or any other noise-emitting devices during testing or other non-emergency situations, Figure C-13.

In general, noise above 90 decibels, when encountered in a non-emergency situation, requires hearing protection provided by the employer. However, hearing protection is not required (even in a non-emergency situation) if its use would create an additional hazard to the user.

Employers must engage in a noise reduction program to identify potentially harmful noise sources and reduce or eliminate these sources. The program should be described in writing by the employer and may be incorporated into the employer's Standard Operating Procedures.

Federal and state regulations on general workplace noise (N.J.A.C. 12:100-4.2(a)6 and US CFR 1910.95) also apply to firefighters.

Career and volunteer firefighters are covered by PEOSHA hearing protection rules at this time.

Filling Air Cylinders

Filling of air cylinders must be performed only by firefighters specifically trained to do this work. Filling gas cylinders must be done only in areas equipped to protect the operator and nearby personnel. These regulations on filling air cylinders are effective at this time.

Apparatus Operational and Passenger Safety

All firefighters (except the driver) must don protective gear before boarding apparatus leaving the station for a fire or other emergency. No firefighter is allowed to put on protective gear while riding on moving apparatus.

Employers must provide seat belts or harnesses for all firefighters riding apparatus, figure C-14.

All the fire apparatus purchased or remanufactured after January 4, 1993, must have enclosed seating with seatbelts for all personnel

riding on the apparatus.

Standards for this seating can be found in the following NFPA standards:

Pumpers – NFPA 1901-1991

Initial Attack – NFPA 1902-1991

Mobile Water Supply – NFPA 1903-1991

Aerial Ladder and Elevating Platform – NFPA 1904-1991

These standards call for fully enclosed seats with seatbelts for whatever number of personnel is specified by the purchasing employer. A seat must be provided for each firefighter the apparatus is designed to carry.

Each seat must be at least 18 inches wide by 15 inches deep. Headroom must be at least 36 inches from the top of the cushion to any overhead obstruction. Each seat must have at least 22 inches of shoulder room. Driver seats must be adjustable from front to back, and driver compartments must have seating capacity for at least two firefighters.



Figure C-14. Employers must provide seatbelts or harnesses for all firefighters riding apparatus.

Maintenance of Firefighter Equipment

Any equipment required by PEOSHA rules must be removed from service if it is damaged or unserviceable.

Fire department aerial apparatus is required under these revised standards to be tested in accordance with NFPA 1914-1991, Testing Fire Department Aerial Devices. This standard calls for annual visual, operational, and load testing. Additionally, every five years, or if the ladder is damaged or fails the annual testing, ladders shall be subjected to complete inspections and nondestructive testing as described in NFPA 1914-1991.

This standard is in effect at this time.

FIREFIGHTER SAFETY

NJ Fire Service Incident Management System

In 2007, the NJ Fire Safety Commission directed the Division of Fire Safety in conjunction with the Firefighter Safety and Health Advisory Council to initiate the development of a statewide firefighter safety standard that would significantly increase the level of firefighter safety at emergency incidents and seamlessly integrate into the existing NJ Fire Service Incident Management System. It was felt that a common standard of this type was necessary in order to ensure the state's firefighters were properly protected to the highest levels of safety during emergency incident operations. Additionally, it was imperative that the standard be easily implemented, contain common terminology, meet other current nationally recognized standards, and encompass several critical components of incident safety not previously addressed in NJ Regulations.

After conducting a substantial amount of research and challenging work, the parties involved agreed on a standard that would meet the original goal of improving the safety of firefighters operating at emergency incidents. The proposal was presented to the Fire Safety Commission who, with their endorsement, presented it to the Department of Community Affairs, Commissioner Doria, for adoption into regulation. The Commissioner adopted the regulations on April 14, 2008 and the regulations became effective June 2, 2008.

While the standard emergency incident priorities of life safety, incident stabilization, and property conservation stand true to this day, it is the life safety of firefighters that has become the foundation of effective emergency incident operations and the number one priority for incident commanders at emergency incidents. Safety standards create a solid basis from which the incident commander and emergency responders can operate from in the dynamic and fluctuating environment of an emergency incident. The stable foundation created by these standards coupled with strict adherence to applicable local standard operating guidelines (SOG's) will form an acceptable level of firefighter safety at emergency incidents.

It is critically important for firefighters to understand that firefighting is one of the most dangerous occupations to be engaged in.

Regardless of the pre-determined levels of safety provided to personnel operating at emergency scenes the extreme hazards presented by the dangerous environments and IDLH atmospheres firefighters are forced to operate in cultivate events and circumstances that can lead to severe injuries and fatalities. This is the profession's reality. However, in an effort to counter this recognized fact firefighters must develop and practice an individual and team oriented attitude of "safety first" while operating at emergency incidents. This attitude shall include actively supporting and practicing the following NJ Firefighter Safety Regulations.



Figure C-15. Command Staff needs to constantly monitor and update critical information.

SAFETY OFFICER

NFPA 1500 and 1561 mandate the assignment of an Incident Safety Officer (ISO) at emergency incidents. Since the inception of these standards and the adoption of New Jersey's Incident Management regulations in 1995, fire departments have been required to operate within the parameters of a uniform incident management system (IMS) that includes the assignment of a Safety Officer at every response. The NJ Firefighter Safety regulations adopted in June of 2008 mandates the assignment of a safety officer at every significant emergency event (N.J.A.C. 5:75-2.5 Safety Officer). In this method the new regulations integrate seamlessly with the current IMS regulations and should not pose any additional burden on fire department emergency

operations. As written, the new regulation allows the incident commander to serve as both the IC and the safety officer at an emergency incident. However, the staffing of the safety officer position in this manner is not conducive to ensuring an appropriate level of firefighter safety. It is a documented fact that the IC has a significant amount of responsibility at an incident. This responsibility makes it extremely difficult, if not impossible, to effectively complete his duties and those of the safety officer. To offer assurances that an IC will assign an operational staff member to this position the new regulation specifically defines a significant emergency event as “any occasion or instance for which, in the determination of an incident commander, he or she cannot effectively monitor conditions to insure the safety of assigned personnel or he or she deems an operations section is needed or where firefighters are exposed to conditions immediately dangerous to life or health (IDLH) a safety officer shall be appointed.” Based on this definition, the clearly recognizable fact that countless fire department responses can be categorized as a significant event, and the acknowledged dynamic nature of emergency incidents, many fire departments have taken a proactive approach to ensuring this position is properly staffed prior to an emergency response with a member other than the incident commander. This practical method of assigning personnel to this position prior to an incident has rapidly become the standard by which most fire departments in New Jersey operate. The full text of the safety officer regulation is indicated below.



Figure C-16. A Safety Officer monitors all activities on the fireground

N.J.C.A. 5:75-2.5 Safety Officer

(a) An incident commander shall appoint a safety officer at every significant emergency event.

1. "Significant emergency event" means any occasion or instance for which, in the determination of an incident commander, he or she cannot effectively monitor conditions to insure the safety of assigned personnel or he or she deems an operations section is needed or where firefighters are exposed to conditions immediately dangerous to life or health (IDLH).

2. Complex incidents or those that cover a large geographic area may require the appointment of assistant safety officers, who shall be assigned to branches, divisions, or groups.

(b) The following items shall govern the appointment of a safety officer:

1. The safety officer shall be assigned as early in the incident as possible and shall be knowledgeable in the actions being implemented;

2. The safety officer shall report directly to the incident commander;

3. The safety officer shall identify existing or potential hazards and inform command of those findings;

4. The safety officer shall recommend to the incident commander any changes to the incident action plan as a result of on-going surveys;

5. The safety officer shall have the authority to alter, suspend, or terminate any activity that is an unacceptable safety risk. The safety officer shall inform the incident commander and other affected operational personnel immediately if he or she changes any operational activities for safety reasons; and

6. When operating in hazardous positions, the safety officer shall be attired in appropriate personal protective equipment (PPE), including self contained breathing apparatus (SCBA); have radio communication equipment; and be accompanied by another firefighter.

(c) If a safety officer has not been appointed, the incident commander shall be the safety officer.

EMERGENCY RADIO TRAFFIC

Proper and effective emergency incident radio communications is one of the most influential and direct contributing factors enhancing firefighter's safety at emergency incidents. Common terminology, a clear and concise voice,

calm demeanor, and professional radio conduct are the key ingredients to effective radio communications at emergency incidents. It is therefore a learned skill not commonly associated with the standard classroom environment. This fact alone forms a basis as to how important it is for firefighters to practice effective communications and understand how the dynamics of communication can effect the overall operation of an emergency incident.

Incident commanders, company officers, and firefighters who employ substandard radio communications at emergency incidents create stressful situations that can generate an emergency incident environment filled with confusion, disorder, and incompetent incident management under normal conditions. A much more serious communication problem can develop during incidents at which firefighters become trapped or disoriented within a structure or area ultimately requiring rescue from a rapid intervention crew or other emergency responders. If incident commanders and firefighters cannot effectively manage radio communications and deliver accurate information at a common everyday incident how can they be expected to perform during an intense, dynamic, and duress filled operation requiring the rescue of trapped firefighters? In order to provide the New Jersey fire service with direction and a common standard operating guideline to place into effect during these type of life-threatening incidents the State regulations adopted in 2008 includes a section on Emergency Radio Traffic. Essentially, this section details the common terminology radio protocol, and step by step standard operating guidelines that are mandated to be written and utilized by fire departments throughout the state in the event a firefighter becomes lost, disoriented, or injured at an emergency response thus ensuring the use of common terminology at emergency incidents.

Experience has shown that strict adherence to a standard set of emergency communication procedures by disciplined firefighters is a critical component of controlling the turmoil created during the issuance of a “mayday” message and subsequent rescue operation. To further reduce the opportunity for disorder during these events the emergency radio traffic section of these guidelines include specific details on the prioritization of emergency radio traffic or “mayday messages” over routine communication, identifying who can call a “mayday”,

distinguishing conditions requiring a “mayday”, confirming the procedure used to call a mayday, accurate use of the LUNAR acronym, and management of the PASS alarm during a “mayday” situation. Figure C-17

Fire Chiefs are ultimately responsible for the overall safety of their firefighters. One of the most positive ways to ensure this obligation is fulfilled is to support and follow the mandates included in these new regulations. A proactive fire department committed to the safety of their members will write effective standard operating guidelines that meet the emergency radio traffic regulations indicated below and train their firefighters to use them as necessary during emergent situations. The full text of the emergency radio traffic regulation is indicated below.

N.J.A.C. 5:75-2.6 Emergency radio traffic

(a) A fire department communication system shall provide a standard method for giving priority, over that of routine radio communication, to the transmission of emergency messages and notification of imminent hazards to all levels of the incident command structure.

(b) When firefighters encounter conditions that pose a non-routine threat to their life or safety or that of others, they shall convey that situation via two-way radio to incident commanders and/or rescue crews utilizing clear text (see (f) below).

(c) Fire departments shall have a written standard operating guideline or procedure that uses the radio terms "emergency traffic" or "mayday" as a designation to clear radio traffic. An incident commander, safety officer, division or group supervisor, or any member who is in trouble or sees an emergency condition can declare emergency traffic.

1. Various radio tones may also be used to draw attention to an "emergency traffic" or "mayday" message.

(d) Examples of emergency conditions that warrant emergency radio traffic include:

1. A firefighter down or has fallen;
2. A firefighter missing;
3. A firefighter trapped;
4. A firefighter lost;
5. A firefighter "stuck";
6. The need to immediately evacuate the building or area;

7. A building or structure collapse or imminent collapse;
8. A wind direction shift, such as from north to south;
9. Changing from offensive to defensive operations;
10. Equipment failure posing an imminent danger;
11. Fire discovered entering an exposure to a degree that any delay may considerably enlarge the fire problem;
12. Necessity to change from an interior to an exterior attack mode; or
13. Loss of water or other extinguishing agent that would endanger members.

(e) Whenever "emergency traffic" or "mayday" is transmitted via two-way radio, all communications on that frequency shall cease except those between the firefighter initiating the emergency radio transmission and the incident commander and/or the fire department dispatch center. Normal two-way radio use may be resumed upon completion of the emergency message, unless the incident commander orders otherwise.

(f) When a member has declared an emergency traffic or "mayday" message, he or she shall use clear text terms identified in their fire department standard operating guidelines or procedures, such as "firefighter down," "firefighter missing," etc.

1. The term "mayday" shall not be used when operating with aviation or marine personnel.

(g) The procedure for the use of "emergency traffic" or "mayday" is as follows:

1. Firefighters in life-threatening situations shall immediately contact the incident commander via two-way radio stating "emergency traffic" or "mayday" and then identify themselves;
2. The incident commander, upon hearing the "emergency traffic" or "mayday" radio transmission, shall acknowledge the person issuing the "emergency traffic" or "mayday" via two-way radio by stating "emergency traffic, clear the channel";
3. The person making the "emergency traffic" or "mayday" call shall respond to the incident commander by repeating "emergency traffic"



Figure C-17. Emergency radio procedures should be trained for on a consistent basis.

or "mayday," shall identify themselves, their unit and assignment, shall report the nature of the situation including resources needed and shall give their location (LUNAR-location, unit, name or number, assignment and resources needed). Repeating the "emergency traffic" or "mayday" radio transmission shall give any emergency personnel monitoring the radio frequency that may have missed the first transmission an opportunity to hear and react to the "emergency traffic" or "mayday" call accordingly;

4. A person in distress who initiates an "emergency traffic" or "mayday" call shall first activate their personal alert safety system (PASS) device and, if applicable, their radio's emergency button. A person in distress who initiates an "emergency traffic" or "mayday" call shall coordinate his or her radio transmissions with the activation of his or her PASS device;

5. "Emergency traffic" or "mayday" transmissions that are not acknowledged shall be repeated until they are acknowledged.

6. Any fire officer or firefighter hearing an "emergency traffic" or "mayday" signal and realizing that it is not being acknowledged shall acknowledge the radio transmission, ascertain its nature and promptly relay all information to the incident commander;

7. Upon receipt of an "emergency traffic" or "mayday" radio transmission, the incident commander shall be responsible for determining appropriate actions to mitigate the

situation at hand; and

8. At the conclusion of the emergency condition, an "all clear for emergency traffic" shall be transmitted to allow a return to normal operations.

(h) Fire departments should use communication systems that are appropriate for emergency radio communications.

(i) Fire departments shall develop and utilize written standard operating procedures/guidelines that comply with the requirements of this section for the use of emergency radio transmissions.

(j) Fire departments shall assure that all emergency response personnel receive training adequate to ensure proficiency in the procedures as set forth in this section.

EVACUATION SIGNAL

Emergency incident operations are extremely fluid events that place firefighters in exceptionally hazardous environments. Added to this fact is the constant threat of a significant major occurrence during the operation such as a collapse, flashover, or back draft. These rapid and unpredictable changes have been known to transform a common everyday response into a chaotic and life threatening situation.

When an incident such as this occurs during a response the incident commander is required to make swift and confident decisions regarding the continuation or termination of the operation. These difficult decisions are typically measured by the level of risk imposed on the firefighters by that catastrophic event. If the decision to terminate the operation and evacuate an area or structure is made by the IC, he is responsible to account for and assure the safety of all firefighters at the scene. This can be an intimidating and complicated task marked by extreme danger and disorder.

It is conclusively acknowledged that the incident commander is responsible to ensure the evacuation process is managed properly. However, firefighters operating at a scene must also understand the critical role they play in the overall effectiveness of the evacuation procedure. In reality, the responsibility of evacuating an area is a team oriented procedure ordered by the IC, but carried out by the personnel operating in the IDLH environment. Its effectiveness is therefore based on excellent communication of the evacuation order and well disciplined firefighters who acknowledge and comply with the message. In an

effort to provide the incident commander and firefighters with the resources necessary to conduct an effective evacuation a common statewide procedure has been adopted. By adopting and mandating the use of this standard the state has provided fire departments with a universal evacuation system capable of being effortlessly integrated into an individual department's standard operating guidelines, IMS system, and state mandated accountability procedures. The full text of the evacuation signal regulation is indicated below.

N.J.A.C. 5:75-2.7 Evacuation signal

(a) When the risk posed to firefighters is so great that an incident commander or his or her designee must order an evacuation from a hazardous area, a uniform procedure and accompanying audible signal recognizable by all personnel operating on an incident scene shall be established, adopted and utilized by all fire departments.

(b) The evacuation signal shall consist of repeated short blasts of an air horn for a period no longer than 10 seconds, followed by 10 seconds of silence. This sequence of repeated short air horn blasts for 10 seconds followed by a 10- second period of silence shall be done three times; the total evacuation signal, including periods of silence, shall last 50 seconds.

1. To reduce the possibility of missing radio messages while the evacuation signal is sounding, incident commanders shall designate apparatus away from the command post as the signal sounder.

2. For fire departments operating at multi-discipline scenes, the evacuation signal shall be as designated in the incident action plan.

(c) Whenever an emergency evacuation signal is being sounded, there shall also be a radio message transmitted either from the incident scene or from the designated fire department dispatch center announcing the evacuation order. To the extent possible, the radio message should be coordinated with the sounding of the evacuation signal to insure the radio messages are heard.

(d) The emergency evacuation signal shall be activated whenever it becomes necessary for firefighters and related agency personnel to immediately evacuate a building or an area in which emergency operations are taking place due to conditions posing an immediate and probable

hazard to life. The evacuation order shall only be conducted upon the order of the incident commander or his or her designee.

(e) Upon being alerted to an emergency evacuation signal, all personnel shall evacuate the hazardous area to an area of obvious safety. As all personnel evacuate, they shall warn others in the event they have not been alerted by the signal. During an emergency evacuation, it may be necessary to abandon equipment in order to evacuate the hazardous area quickly and safely. Firefighters should retain any equipment needed to insure personal firefighter safety during the evacuation, that is, self-contained breathing apparatus (SCBA), personal protective equipment (PPE), etc.

(f) Once personnel have exited the hazardous area, they shall report to their company officer or assemble in a predetermined area where officers shall take roll of those present. Personnel accountability tags (PATs) shall be retrieved by firefighters at the time of roll call. A personnel accountability report (PAR) shall be communicated to the incident commander when the roll call is complete. If it is determined that personnel are missing, resources shall be immediately focused on the goal of rescuing or locating those persons missing.

(g) Re-entry to an evacuated hazardous area for normal firefighting-rescue operations shall be permitted only upon the order of the incident commander or his or her designee.

(h) Fire departments shall develop and utilize written standard operating procedures/guidelines for using emergency evacuation signals that comply with the requirements of this section.

(i) Fire departments shall assure that all emergency response personnel receive training adequate to ensure proficiency in the procedures as set forth in this section.

RAPID INTERVENTION CREWS (RICs)

A rapid intervention crew can be defined as a team of firefighters specifically designated by the incident commander to standby in a state of readiness should the need arise to initiate a rescue effort of a distressed or missing member at an emergency incident. Due to the many hazards faced at emergency incidents it is imperative that a highly skilled and well trained team such as the one described above be readily available to rescue one of their own should the need arise. The use of these

“firefighter rescue” crews (RIC’s) has been inherently built into fire department emergency incident operations for over ten years and in that time have evolved into the most formidable, effective and accessible resource an incident commander possesses to enhance the safety of firefighters operating at emergency incidents. One of the more important revisions to current model RIC programs adopted within the new state regulations is a modification of the name and associated acronym given to a firefighter rescue team. Historically these teams have been called either firefighter assistance teams (FAST) or rapid intervention teams (RIT). However, the State has adopted a revised term of rapid intervention crew (RIC) as a common statewide designation. This follows current NFPA and IMS standards.



Figure C-18. Rapid Intervention Crew standing by in a state of readiness at an emergency incident

Within the RIC safety regulations incident commanders are granted the discretion to request the response of a RIC when he/she deems the “circumstances dictate” the need. One could assume that allowing this generous level of discretion may create a significant gap in the standard level of safety provided to firefighters across the state. In essence, “What one incident commander may deem as mandatory, another may not.” In order to ensure this unpredictable disparity is removed from an operation and a standard level of RIC usage is maintained throughout the state, incident commanders and those acting in that position must adopt a “no exceptions” attitude regarding the use of RICs at emergency incidents. If taken, this stance will not only solidify the intent

of the new regulations, it will also significantly increase firefighter safety at emergency scenes.

The State regulations follow current NFPA standards that state that a minimum of two (2) firefighters who are trained, equipped, and attired to perform the necessary action(s) of rescuing a downed member shall be assigned as the RIC from the initiation of an incident. While it is common for some fire departments to have staffing shortages during the incipient stage of an incident that will not allow the assignment of more than two (2) firefighters to this team, studies, fire ground experience, and real life rapid intervention crew deployments have provided explicit, documented evidence, that the minimum number of two (2) members indicated above will not be capable of rescuing a downed firefighter. Although the state adopted this minimum number to comply with PEOSHA regulations and NFPA Standards, incident commanders should be prepared to assign a minimum of four (4) and a maximum of six (6) firefighters to each individual RIC. This will ensure an adequate number of personnel are available to complete the multitude of tasks required to be completed by the rapid intervention crew during a rescue deployment. Additionally, the IC may also have to assign multiple RICs for incidents involving specialized rescue operations, large scale incidents, sizeable buildings, and/or other complex responses. Firefighters assigned to rapid intervention crews must be extremely skilled, well trained, and experienced in operating within dangerous and complex environments.

In order to obtain the expertise required to complete the successful removal of a distressed firefighter from an IDLH atmosphere, firefighters must consistently train on the hands-on and classroom based complex skills and abilities required to successfully complete an operation of this type. In an effort to provide New Jersey firefighters with these skills and knowledge a common RIC Awareness training curriculum that coincides and supports the adoption of these regulations has been developed and will be offered to all firefighters across the state beginning in the fall of 2009. In addition, future programs that will establish RIC operations, RIC officer, and RIC team training competencies are being formulated and developed at this time. The full text of the Rapid Intervention Crew regulations is indicated in the following topic.

N.J.A.C. 5:75-2.8 Rapid intervention crews (RICs)

- (a) If the circumstances dictate it, a rapid intervention crew/company (RIC) shall be designated to standby in a state of readiness should the need arise to initiate a rescue effort for downed or missing firefighters.
- (b) An RIC shall be comprised of a minimum of two firefighters who are trained, attired and equipped to perform the actions necessary to facilitate the immediate rescue of other emergency workers.
- (c) The RIC shall have awareness of where resources are committed on the incident.
- (d) To the extent possible, the RIC shall not be assigned to other duties that would in any way delay or impede their rescue effort.
- (e) More than one RIC may be required for large scale or complex operations.
 - 1. A rapid intervention group supervisor shall be assigned to manage multiple RICs.
- (f) Fire departments shall develop and utilize written standard operating procedures/guidelines for using RICs including specialized training for members who will serve on the RIC.



Figure C-19. Rapid Intervention Crews shall be well trained, properly staffed, and provided adequate resources

MEDICAL UNIT/RESPONDER REHABILITATION

Emergency incident rehabilitation is an integral component of ensuring the health and safety of firefighters operating at an emergency scene. Incident commanders are ultimately

responsible for ensuring that the physical and mental condition of emergency responders operating at an event does not deteriorate to a point where it affects the safety of an individual member, his/her crew, or the overall integrity of the operation. Over the past several years fire departments have favorably accepted the need to implement an effective rehabilitation program and provide properly trained and equipped medical evaluation unit(s) at emergency incidents as required. This has been accomplished through the development and definitive use of standard written operational policies reflecting current NFPA standards and PEOSHA regulations related to this fundamental component of firefighter health and safety. Recognizing the need for and requesting rehabilitation services must be accomplished early in an incident. It is essential that incident commanders identify with and adopt this position in order to improve the level of safety of emergency responders.

Extreme temperatures (extreme heat or cold) should not be the lone motive for establishing a rehab sector at an incident. Any activity or event that requires a large number of firefighters, is long in duration, large in size, or involves labor intensive tasks will quickly exhaust the physical capabilities of personnel resulting in the required establishment of a dedicated rehabilitation/ medical sector under the logistics section of the IMS. Although the incident commander maintains full responsibility for the formation of the rehab section, to be effective, rehabilitation should be viewed in a team oriented approach beginning with the individual firefighter and moving upward to the IC. Additionally, it is acutely important for all supervisors to maintain an awareness of the condition of each member operating within their company or area. Competent supervisors should maintain an intimate knowledge of the physical and mental limitations of their company or department personnel and be proactively prepared to request relief for these members based on this knowledge. The full text of the rehabilitation regulations is indicated below.

N.J.A.C 5:75-2.9 Medical unit/responder rehabilitation (rehab)

(a) Incident commanders shall ensure that the physical and mental condition of emergency responders operating at the scene of an emergency does not deteriorate to a point where it affects the safety of each member or it jeopardizes the safety



Figure C-20. A Rehab area should be established for long term incidents

and integrity of the operation.

(b) Responder rehabilitation (rehab) shall be used to evaluate and assist personnel who may be suffering from the effects or sustained physical exertion during emergency operations.

(c) Command officers should consider the need for rehab during the initial planning stages of an emergency response. Climatic or environmental conditions (for example, high or low temperatures) shall not be the sole justification for establishing rehab. Any activity or incident that is large in size, long in duration, and/or labor intensive will rapidly deplete the energy and strength of personnel and therefore merits the establishment of rehab.

(d) All supervisors shall maintain an awareness of the condition of each member operating within their immediate span of control and ensure that adequate steps are taken to provide for each member's safety and health. The command structure shall be used to request relief and the reassignment of fatigued crews.

(e) When the circumstances dictate it, responder rehabilitation shall be the responsibility of a medical unit under the logistics section.

(f) A medical unit shall provide a specific area where personnel will assemble to receive:

1. A medical assessment;
2. Nourishment and re-hydration;
3. Treatment for injuries;
4. Monitoring of physical condition;
5. Transportation for those requiring treatment at medical facilities; and

6. Initial critical incident stress debriefing.

(g) Critical components of a rehab operation shall include:

1. Nourishment and re-hydration;
2. Rest;
3. Recovery;
4. Medical evaluation and treatment; and
5. Accountability.

(h) Fire departments shall develop and utilize written standard operating procedures/guidelines for rehab. Each of the elements in (g) above shall be included when developing standard operating guidelines or procedures for carrying out rehab operations.

(i) Rehab shall be responsible to identify resources that have been cleared from rehab and ready for re-assignment through staging or released from the incident.



Figure C-20a. Members operating should be rotated through rehab

INCIDENT TIME KEEPING

It is a very well known fact that incident commanders have a multitude of critical tasks they are responsible for at an emergency incident. The dynamic and changing environment of an emergency incident is rarely conducive to allowing the implementation of a methodical well thought out decision making process. As a result, the process used by the IC in developing an effective incident action plan includes many variables that can have a major impact on the

overall operation. One of the more influential but less thought of factors included in this process involves the capability to accurately confirm the elapsed on scene time of emergency response personnel. Simply stated, all emergency responses can be viewed as time sensitive events. However, the more complex multi-agency structure fire will provide a greater challenge to the incident commander than a simple single engine response regarding his/her ability to accurately record the on scene time of all emergency responders. In order to reduce this uncertainty and enhance the safety of personnel operating at the scene the IC must develop a system of benchmarks to use as a guide in determining the exact duration of time on scene and whether or not the adopted incident action plan is successfully mitigating the emergency.

The standardized incident time-keeping regulations adopt a procedure utilizing elapsed time on scene announcements from the local communications center to the IC in 10-15 minute intervals as the model benchmark system to be utilized throughout the state. Departments are mandated to develop and employ written standard operating guidelines conforming to these regulations. In writing these guidelines departments must be cognizant of the dangers associated with today's modern fire environment and the detrimental effect it has on incident operations and the duration of time firefighters are allowed to operate on the interior of structures. Simply stated, increased on scene operational time translates into increased hazards. Therefore it is critically important for the IC to be provided with time-keeping announcements that begin at time of dispatch and not time of arrival. This will offer the incident commander a more solid foundation as to an accurate time count from which he/she can develop adequate standards to determine if revisions to strategic and tactical operations are necessary. An additional benefit of the time-keeping mandate is that it also provides the incident commander with a prompt from which accountability roll calls can be implemented. The regulation states the IC shall use the 30 minute time interval (or other standard time) to conduct incident roll calls. The full text of the Incident time-keeping regulations is indicated below. Figure C-21.

**N.J.A.C 5:75-2.10 Incident
Time Keeping**

(a) For time sensitive incidents, fire departments shall develop a system that provides the incident commander with elapsed time on-scene, in 10- or 15-minute intervals, from their communications center.

(b) The elapsed time on-scene shall be used to provide the incident commander with time frames that could signal the need for a change in tactical operations.

(c) The elapsed time on-scene shall be used every 30 minutes or some other standard time as established with dispatch for required roll calls.

(d) Fire departments shall develop and utilize written standard operating procedures/guidelines for incident time-keeping.



Figure C-21. Incident timekeeping and updates from the dispatch center are vital to strategic and tactical decision making

ACCOUNTABILITY

NJ PERSONNEL ACCOUNTABILITY SYSTEM (NJPAS)

In 2001, the NJ Fire Safety Commission directed the Division of Fire Safety in conjunction with the Firefighter Safety and Health Advisory Council to develop a statewide standard for fire department personnel accountability systems. It was felt that in order to provide uniform accounting of firefighters at emergency incidents throughout the state, especially where two or more departments worked together, one system utilizing the same operational components was necessary, Figure C-22.

Such a system had to be easy to use yet effective, as inexpensive as possible, and be as compatible with existing systems in use by fire departments as possible.

After weighing many options, the parties involved with the system's development agreed on a two-tag system that would allow incident commanders to know where firefighters were operating at any given time.

The proposal was presented to the Fire Safety Commission who, with their endorsement, presented it to Department of Community Affairs Commissioner Levin for adoption into regulation. The Commissioner adopted the regulations on May 3, 2002 and the regulations became operative on January 3, 2003.

Personnel accountability is one of the most critical elements on an incident scene with regard to firefighter safety. Essentially, personnel

accountability is an effort to improve the safety of emergency responders by keeping track of their locations and assignments when operating at the scene of an incident.

A properly implemented PAS will help to ensure that the incident command staff knows the exact number and identity of personnel working at an incident, their approximate locations, and whether they are in distress, Figure C-22a. In some form or another, regardless of size or nature, personnel accountability is a part of every incident to which fire and rescue personnel may respond. Failure to maintain personnel accountability can, and does, have tragic results. In order for a personnel accountability system to perform efficiently at an emergency incident, individual firefighters must "buy into" the process and set the foundation for compliance by properly affixing their tags at the designated collection point while responding and prior to entering the IDLH atmosphere. It is at this critical point of initiation that the effectiveness of the entire system for that particular incident is established and confirmed. However, at no time should a personnel accountability system be considered the only solution to securing firefighter accountability at emergency incidents. Several other critical operational factors will have a major impact on the safety and accountability of firefighters operating in IDLH atmospheres and can actually enhance the efficiency of the system. These factors include a commitment to complete specific task assignments in a systematic and organized method, maintaining company integrity, eliminating freelancing, assigning competent company officers, and the ability to communicate effectively with all personnel operating at the incident. In the event that an emergency responder is injured or otherwise incapacitated on the scene of an emergency, a properly functioning PAS should assist rescuers in locating the personnel in trouble and get them to safety quickly.

It is important to note that NFPA 1561, adopted as an integral part of the regulations of New Jersey's Incident Management System requires that the accountability system "shall include a means to specifically identify and keep track of members entering and leaving hazardous areas."



Figure C-22 A personnel accountability system is designed to track the status of crews working on the scene of an incident.

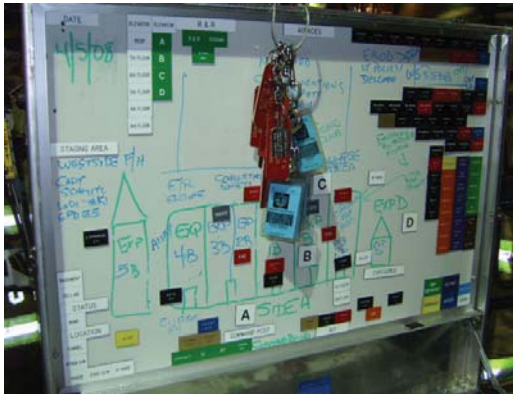


Figure C-22a The PASS ensures the incident command staff knows the exact number and identity of personnel working at an incident.

THE NJ PERSONNEL ACCOUNTABILITY SYSTEM

The New Jersey Personnel Accountability System (NJPAS) is basically a system that tracks three key elements on the incident scene: location, function and time. The regulations set forth the minimum requirements of the system including the hardware required to operate the system.

Very basically, each firefighter is to be issued two accountability tags. These tags may be simply laminated ID cards produced in-house, or some other type of tag constructed of plastic, metal or other durable material. Each tag is to have at minimum the firefighter's name and fire department affiliation. Tags are to be equipped with a fastening latch that can be affixed to the firefighter's turnout gear and can be clipped and un-clipped with a gloved hand.

Once on the incident scene, the firefighter should place one tag at a central collection point as determined by SOP or the incident commander (IC). Such a point might be the incident command post or the apparatus that the firefighter responded with. Career firefighters might place this tag on their apparatus at the beginning of each shift if that is the department's policy. A central collection point is necessary so that the IC and command staff have a reliable way to know who is operating on the incident scene as a whole, Figure C-23.

The second tag is to be given to the Personnel Accountability Officer (PAO) upon entering any hazardous area. Usually, this will be when the firefighter enters a structure or space where they will be performing firefighting or rescue operations in an Immediately Dangerous to Life and Health (IDLH) atmosphere. However, this requirement also applies where firefighters may be involved in

wildland operations or confined space operations where there is a risk of becoming lost or disoriented either in wide expanses or maze-like areas. Upon leaving the hazardous area, the tag is to be retrieved by the firefighter.

The secondary tag should also be used when a firefighter checks into a rehabilitation station or a decontamination station or other specialized operational area at an incident scene. In this way, there is always someone other than the



Figure C-23 Accountability tags are placed at a central collection point.

firefighters themselves that knows where they are and what they are doing.

It is usually advisable to limit the number of points of entry into a hazardous area. In this way, it is easier to monitor entry and egress of firefighters and can reduce the potential for freelancing. However, where there are different points of entry into a hazardous area, firefighters entering will need to be accounted for. Many times more than one entry point is observable by one PAO such as at a corner of a structure. Other times it may be advantageous to designate more than one PAO if it is necessary to operate multiple points of entry. Some volunteer departments have found it feasible to utilize Fire Police who are not assigned to their normal duties to act as PAOs. In some career departments, an Incident Management Specialist position has been instituted. These individuals may be utilized as PAOs. Departments may need to develop innovative solutions in order to comply with the regulations and provide appropriate accountability for personnel.

Fire departments may, at the very beginning of operations at an incident, find it difficult to provide staffing for the accountability function. While the lack of staffing does not relieve the department from maintaining proper accountability of its members, some innovation may be necessary. One

method may involve the placing of a large traffic cone with a metal ring attached near the entry point. In this way, members entering a hazardous area can "tag in" on the cone. It must be remembered that until a PAO is assigned, the incident commander retains the responsibility for the function in accordance with the requirements of the NJ Incident Management System. It is recognized that the incident management system at any incident grows with the incident and as additional staffing arrives.

Another way of providing accountability until a PAO is assigned is for the "two-out" personnel to maintain accountability. These are the two individuals that are required to be outside the hazardous area in a ready state in case it becomes necessary to rescue the initial team of firefighters in the hazardous area.

These previously referred to "interim actions" must only be utilized prior to the assignment of a PAO and should not be relied upon as a means of providing accountability throughout an incident. A PAO should be assigned as soon as it is possible. If departmental staffing is so short that it is often difficult to staff the accountability function, then additional staffing in the form of mutual aid may be an option.

It must be noted that the scope of the PAS does not simply involve the transfer of tags between personnel on the incident scene. The tags are only the tools for the PAO to use to monitor personnel with regard to location, function and time.

Taken individually beginning with location, the PAO by monitoring entry into a hazardous area knows the approximate location of firefighters. By using some type of accountability board divided by location i.e. basement; division 1; roof etc., tags can be grouped into the area where the firefighting team is assigned.

In the same way, function can be monitored in conjunction with location i.e. division 1 search; roof ventilation etc. depending upon assignment.

Time can be monitored by the PAO by utilizing a dry erase marker on a suitable accountability board for example. By marking the time of entry of each crew and knowing the average duration of the department's SCBA, the PAO can gauge as to when to expect the crew to exit or if they might be in trouble if they are overdue. The key to all of this working effectively is communication between the interior crews and the PAO regarding where the crew is assigned and what their function is. Additionally, communication between the interior crews and the IC or designated officer

with regard to regular situation/status reports should inform those outside what they are experiencing and accomplishing. The incident commander should also be asking for information on a regular basis. All players have an equal responsibility to ensure that every firefighter is accounted for at all times.

Another important part of the PAS is the Personnel Accountability Report (PAR) and roll call. If there is any question regarding the whereabouts or safety of firefighters, or if there is a change in firefighting mode, or if an evacuation is ordered, the IC will call for a PAR. A PAR is actually the result of a roll call conducted by the PAO and

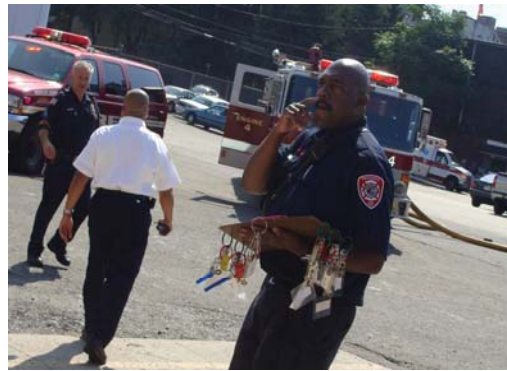


Figure C-24. An Accountability Officer tracks members operating at an incident.

Company officers via portable radio, to ensure all firefighters are accounted for and in a safe location. The primary reasons for the IC to call for a PAR are the following:

- If there is a report of a firefighter missing.
- When an emergency evacuation is ordered.
- When the incident is declared under control.
- When changing attack modes (i.e. offensive to defensive). See figure C-24.
- Anytime the IC feels it necessary to conduct a PAR.

Once the roll call is completed the PAR is then conveyed to the IC and if there are any firefighters unaccounted for, search and/or rescue operations are then undertaken. Usually if the PAO is holding firefighter's tags when a PAR is ordered, the PAO must try to ascertain where the firefighters that he/she is holding tags for are located.

It cannot be more strongly stressed that all those operating on the incident scene play an important role in the PAS. It is for this reason that all members be trained in the use of the system. Additionally, the system needs to be instituted on every incident except those that are so minor all firefighters are in plain sight at all times.

INTEGRATION WITH NJ INCIDENT MANAGEMENT SYSTEM

Since the inception of New Jersey's Incident Management regulations, fire departments have been required to operate within the parameters of a uniform incident management system (IMS). Part of the requirements of the IMS has always been that a fire department must utilize a PAS. The NJPAS regulations have expanded upon that requirement by providing a specific uniform method of complying with the original regulations. In this way the new regulations integrate seamlessly with the IMS and should pose little if any additional obligations on a fire department than what was originally required.

ACCOUNTABILITY OPTIONS

As stated earlier in this booklet, the regulations for PAS are the minimum requirements that must be adhered to by fire departments. There are many enhancements that a department may want to implement to make the PAS more effective or easier to use. Tools such as dry erase accountability boards provide an easy way to organize firefighters' tags by location and function in the hazardous area, they can provide the PAO a quick reference to rapidly assess the location all the firefighters he/she is responsible for.

Additionally, some departments find that medical information on a personnel accountability tag (PAT) relating to the firefighter is useful in the event a firefighter is injured and transported to a hospital. Normally the most suitable type of PAT for this would be the laminated type where the inner part of the tag is folded in half with the confidential medical information inside. The tag is then laminated and if it is necessary to access the information, the tag is cut open.

If medical information is to be collected and included on the PAT, it must be remembered that all information is confidential and should not be shared beyond those responsible for the collection of the information without the permission of the information's owner. Information collection should also never be mandatory. A firefighter may not want to share all or any of their personal information and they should be informed that it is their right to provide only what they wish to. Any information provided should not be used for any other purpose.

Another consideration is whether the information collected will be utilized by EMS or a hospital. Some health care providers may not want to rely on what could be outdated or incorrect information.

It would probably be best for the fire department to meet with their normal EMS and healthcare providers to find out whether the information provided will be used in an emergency, and if so, what information in particular would be useful to collect.

Some departments may wish to issue additional PATs above the two that are required by the regulations. Departments are free to do this if for instance it is desired for a firefighter to have a PAT on his/her person at all times in the unfortunate circumstance where identification of a severely injured or deceased firefighter must be made. Other reasons for extra PATs may be secondary access to smaller areas inside a larger hazardous area such as high rise buildings or large complexes; or where firefighters may travel on vehicles to remote locations before being assigned to tasks, such as a large wildland fire scenario.

One key element of the new PAS regulations is the ability for newer technology that provides at least the same level of firefighter safety to be utilized. There are some advanced systems that are basically like simple tag systems with features that integrate computerization. An example is a system that utilizes bar coding, where instead of a tag with readable printing, the bar code contains the firefighter's information. This code is scanned into a computer and a task and location are input to show where the firefighter is and what his/her assignment is. With a standard tag system, an accountability board and dry erase marker perform the same function manually.

There are newer systems on the horizon that utilize Global Positioning System (GPS) technology where firefighters have "sending units" attached to their gear or integrated into their SCBA that send signals to satellites and then to a central computer on the incident scene. The location and movements of each firefighter are tracked accurately within a few feet of their position and displayed on the computer screen. Some of these systems provide for telemetry between the computer location and the individual firefighters and are capable of monitoring breathing rate, air supply and interior temperature. Additionally, they can provide for the activation of integrated PASS devices and the transmission of distress signals to the outside.

FURTHER INFORMATION

Appendix IV contains Regulations for the NJ Personnel Accountability System. Appendix V has Regulations for the NJ Incident Management System, and includes Appendix V is a Model SOP for the NJ Personnel Accountability System.

**REGULATIONS FOR THE NJ
PERSONNEL ACCOUNTABILITY
SYSTEM**

N.J.A.C. 5:75-1.5 Definitions

The following terms shall have the meanings indicated except where the content clearly indicates otherwise:

"Branch" means an organizational level having functional or geographical responsibility for major aspects of incident operations.

"Commissioner" means the Commissioner of Community Affairs.

"Division" means the organization level having responsibility for operations within a defined geographic area.

"Emergency incident" means any situation to which the fire department responds to deliver emergency services including, but not limited to, rescue, fire suppression, emergency medical care, special operations, and other forms of hazard control and mitigation.

"Fire department" means a fire service organization providing rescue, fire suppression and related activities. The term "fire department" shall include any public, governmental fire service organization engaging in this activity.

"Group" means an organizational level having responsibility for operations within a defined functional area.

"Hazardous area" means any location(s) that may pose a safety and/or health risk to firefighters due to, but not limited to, the presence of products of combustion, the existence of hazardous or otherwise oxygen deficient or oxygen enriched atmosphere, the potential for any immediately dangerous to life and health atmosphere, the use of hazardous equipment or operations, or the potential for any of these situations to exist. Additionally, any area or location that predisposes a firefighter to become lost, disoriented, or trapped, including any structure, confined space and wild land areas, shall be considered a hazardous area.

"Incident action plan" means an oral or written plan containing general objectives reflecting the overall strategy for managing an incident.

"Incident commander" means the individual responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources.

"Incident management system" means a nationally recognized and organized system of

rules, responsibilities and standard operating procedures used to manage emergency operations.

"Logistics section" means the section responsible for providing facilities, services, and material support for an incident.

"Member" means a person, at least 18 years of age, who is involved in performing the duties and responsibilities of a fire department, under the auspices of the organization. For the purpose of this chapter, a fire department member may be a full-time or part-time employee, a paid or unpaid volunteer, may occupy any position or rank within the department and may or may not engage in emergency operations.

"Personnel accountability officer" means the person designated by the Incident Commander to monitor entry into and exit out of hazardous areas for the purpose of ensuring accountability of all personnel in the hazardous area or structure.

"Personnel accountability report" means the results of an accounting of all personnel on the emergency incident scene to the Incident Commander.

"Personnel accountability roll call" means the process of accounting of all personnel on the emergency incident scene.

"Safety officer" means a member of an incident command staff responsible for monitoring and assessing safety hazards and unsafe conditions, and for developing measures for ensuring personnel safety.

Amended by R.2002 d.179, effective June 3, 2002 (operative January 2, 2003); R.2008 d.142, effective June 2, 2008.

N.J.A.C 5:75-2.4 Personnel accountability

(a) As an integral part of the incident management system used by the fire service, personnel accountability shall be maintained through the use of a personnel accountability system meeting the requirements of this section as a means to track and locate all fire department personnel operating at all emergency incidents.

(b) Every member of a fire department shall be issued a minimum of two personnel accountability tags.

1. Such tags shall be constructed of (but not limited to) metal, plastic, plastic laminated paper, plastic laminated cardboard, or similar durable material.

2. Each tag shall be equipped with a latch hook that will allow attachment of the tag to the firefighter's protective clothing. The clip or latch hook shall be designed to be attached and removed by a firefighter with a gloved hand.

3. At a minimum, the tag shall be engraved, imprinted, or otherwise marked or electronically coded with the firefighter's name and fire department affiliation.

(c) At each incident, the Incident Commander shall designate a personnel accountability officer. The personnel accountability officer shall be responsible for ensuring that all personnel are accounted for. The personnel accountability officer may serve other functions at an incident scene if he or she is able to safely perform the accountability function. At minor incidents, the Incident Commander may retain this function as he or she sees fit.

(d) To ensure personnel accountability, each firefighter shall take the following steps:

1. Upon arrival at an incident scene, each firefighter shall surrender the primary personnel accountability tag at a central collection point as designated by the Incident Commander or departmental policy. Such point may be a command post or the apparatus to which the firefighter is assigned;

2. Upon leaving the incident scene, each firefighter shall immediately retrieve his or her personnel accountability tag from the designated collection point and reattach it to the designated area of his or her protective gear as determined by the fire department;

3. Firefighters assigned to a specific piece of apparatus for the duration of a tour of duty shall leave their primary personnel accountability tag on that apparatus for the duration of their tour.

(e) Upon entry in a hazardous area, each firefighter shall surrender the secondary personnel accountability tag to the personnel accountability officer who shall be in close proximity to the entry point into the hazardous area. Upon leaving the hazardous area, the member shall immediately

retrieve his or her personnel accountability tag from the personnel accountability officer and re-attach it to the designated area of his or her protective clothing.

(f) If the need arises to evacuate a hazardous area and an evacuation is ordered, the personnel accountability officer shall:

1. Order an immediate personnel accountability roll call of all members operating at the incident to be conducted as soon as they exit the hazardous area;

2. Assure that every member who has surrendered his or her accountability tag retrieves it and reattaches it to their protective gear;

3. Report immediately to the Incident Commander when crews have not retrieved their personnel accountability tags after a reasonable time, members are unaccounted for, and the need for search and rescue exists or if conditions indicate that the area is immediately unsafe for crews and/or the personnel accountability officer to operate in safely; and

4. Report to the Incident Commander that all members are accounted for if the personnel accountability officer is not holding any personnel accountability tags after an evacuation is ordered.

(g) The Incident Commander shall call for a personnel accountability report:

1. If there is a report of a firefighter missing;

2. When an emergency evacuation is ordered;

3. When the incident is declared under control;

4. When changing attack modes (that is, offensive to defensive); or

5. Anytime the Incident Commander feels it necessary to conduct a personnel accountability report.

(h) When it is announced that a personnel accountability report is to be provided to the Incident Commander, all companies will:

1. Conduct a personnel accountability roll call of the members in that company to ensure all members are accounted for;

2. Cease all but emergency radio

communications; and

3. Report all members accounted for or report members missing.

(i) Nothing in this section shall restrict the use of more sophisticated accountability systems

utilizing bar coding, geographic positioning systems or similar methods providing the intent of this section is met.

New Rule, R.2002 d.179, effective June 3, 2002 (operative January 2, 2003).

Personal Motor Vehicle Emergency Response Lighting

This section is intended to provide guidance to members of New Jersey's fire service on the use of emergency lights based on existing laws governing use and operation.

The first section will provide an overview of the use of blue lights.

The second section provides information on the use of red lights for emergency purposes.

BLUE LIGHTS

N.J.S.A. 39:3-54.7. Members of certain organizations; display of emergency warning lights

a. An active member in good standing of any of the following organizations may mount and operate, on a motor vehicle operated by that member, an emergency warning light or lights as provided in P.L.1977, c. 223 (C.39:3-54.7 et seq.):

(1) a volunteer fire company or a volunteer first aid or rescue squad recognized by and rendering service in any municipality; or

(2) any county or municipal volunteer Office of Emergency Management recognized by and rendering service in any county or municipality, provided the member's official duties include responding to a fire or emergency call.

b. The Chief Administrator of the New Jersey Motor Vehicle Commission shall not require the member to specify on which motor vehicles the emergency warning light or lights may be mounted.

N.J.S.A. 39:3-54.8. Time of operation

Emergency warning lights may be operated only while the vehicle is being used in answering a fire or emergency call.

N.J.S.A. 39:3-54.9. Specifications

Emergency warning lights shall be removable or permanently attached, of the flashing or revolving type, equipped with a blue lens and controlled by a switch installed inside the vehicle or shall be blue of the light bar type, in accordance with the specifications prescribed by the chief administrator .

N.J.S.A. 39:3-54.10. Placement on motor vehicle

No more than two emergency warning lights shall be installed on a vehicle. If one light is used it shall be installed in the center of the roof of the car, or on the front of the vehicle so that the top of

the emergency warning light is no higher than the top of the vehicle's headlights, or in the center of the dashboard. It may be a low profile light bar of the strobe, halogen or incandescent type, or a combination thereof. If two lights are used they may be placed on the windshield columns on each side of the vehicle where spotlights are normally mounted, or on either side of the roof at the front of the vehicle directly back of the top of the windshield. Under no circumstances may one light be placed on the roof and one on the windshield column in the spotlight position. Light elements shall be shielded from direct sight or view of the driver.

N.J.S.A. 39:3-54.11. Display of emergency warning lights; identification cards

a. The Chief Administrator of the New Jersey Motor Vehicle Commission shall prepare suitable identification cards bearing the signature of the chief administrator which, upon the request of the mayor or chief executive officer of any municipality recognizing and being served by a volunteer fire company or a volunteer first aid or rescue squad on a form and in a manner prescribed by the chief administrator, shall be forwarded to the mayor or chief executive officer, to be countersigned and issued by the mayor or chief executive officer to the members in good standing of the volunteer fire company or first aid or rescue squad.

b. Identification cards issued pursuant to this section and sections 5 and 6 of P.L.2005, c. 34 (C.39:3-54.22 and C.39:3-54.23) shall be considered permits to mount and operate emergency warning lights as provided for in P.L.1977, c. 223 (C.39:3-54.7 et seq.) and shall apply to any motor vehicle driven by the member of a volunteer fire company, a volunteer first aid or rescue squad or a volunteer Office of Emergency Management. Emergency warning lights shall not be mounted prior to the issuance of the identification cards. Each member of a volunteer fire company, a volunteer first aid or rescue squad or a volunteer Office of Emergency Management must carry the identification card while an emergency warning light or lights are operated on the vehicle.

N.J.S.A. 39:3-54.12. Rights of motor vehicle with emergency warning lights in operation

Nothing contained herein is intended to grant to any member of a volunteer fire company, a volunteer first aid or rescue squad or a volunteer Office of Emergency Management any privileges or exemptions denied to the drivers of other vehicles, and such members operating emergency warning lights shall drive with due regard for the safety of all persons and shall obey all the traffic laws of this State including R.S.39:4-81, provided, however, that the drivers of non-emergency vehicles upon any highway shall yield the right of way to the vehicle of any member of a volunteer fire company, a volunteer first aid or rescue squad or a volunteer Office of Emergency Management operating emergency warning lights in the same manner as is provided for authorized emergency vehicles pursuant to R.S. 39:4-92.

N.J.S.A. 39:4-81. Observing traffic signals

a. The driver of every vehicle, the motorman of every street car and every pedestrian shall obey the instructions of any official traffic control device applicable thereto, placed in accordance with the provisions of this chapter, unless otherwise directed by a traffic or police officer.

b. When, by reason of a power failure or other malfunction, a traffic control signal at an intersection is not illuminated, the driver of a vehicle or street car shall, with respect to that intersection, observe the requirement for a stop intersection, as provided in R.S.39:4-144.

N.J.S.A. 39:3-54.13. Violations; penalty

Any person authorized to operate emergency warning lights pursuant to P.L.1977, c. 223 (C.39:3-54.7 et seq.) who willfully operates such emergency warning lights in violation of the provisions of P.L.1977, c. 223 (C.39:3-54.7 et seq.) shall be liable to a penalty of not more than \$ 100 and the person's privilege to operate such emergency warning lights may be suspended or revoked by the Chief Administrator of the New Jersey Motor Vehicle Commission. A person who is not authorized to operate emergency warning lights who willfully operates such emergency warning lights shall be liable to a penalty of not more than \$ 200.

N.J.S.A. 39:3-54.15. Red emergency warning lights and/or siren on motor vehicles owned by current volunteer fire chief or first assistant chief or chief officer of first aid or rescue squad

A current chief or first assistant chief of a volunteer fire company, or chief officer of a first aid or rescue squad, recognized by and rendering service in any municipality may mount and operate on a motor vehicle owned by him and registered in his name a red emergency warning light or lights, a siren, or both, as prescribed in P.L.1985, c. 171 (C.39:3-54.15 et seq.). The size and type of lights and siren, and the location of their controls, shall be determined by the Chief Administrator of the New Jersey Motor Vehicle Commission.

N.J.S.A. 39:3-54.16. Placement of red emergency warning lights

All red emergency lights shall be mounted on the exterior of the motor vehicle. No more than two red emergency warning lights shall be installed on a vehicle. If one light is used it shall be installed in the center of the roof of the vehicle, or on the left windshield column in a position where a spotlight is normally located. If two lights are used they may be placed on the windshield columns on each side of the vehicle where spotlights are normally mounted, or on either side of the roof at the front of the vehicle directly back of the top of the windshield. Under no circumstances may one light be placed on the roof and one on a windshield column in the spotlight position. They shall be operated only while the vehicle is being used by the registered owner chief or first assistant chief in answering a fire or emergency call.

N.J.S.A. 39:3-54.17. Placement of sirens

All sirens shall be mounted under the hood of the motor vehicle and shall be operated only while the vehicle is being used by the registered owner chief or first assistant chief in answering a fire or emergency call.

N.J.S.A. 39:3-54.18. Identification cards for chief or first assistant chief; issuance; purpose

The Director of the Division of Motor Vehicles shall prepare suitable identification cards bearing the signature of the director, which, upon the request of the mayor or chief executive officer of any municipality recognizing and being served by a volunteer fire company, on a form and in a manner prescribed by the director, shall be forwarded to the mayor or chief executive officer, to be countersigned and issued by the mayor or chief executive officer to the chief or first assistant chief of the volunteer fire company. Identification cards issued pursuant to this section shall be considered permits to display and operate red emergency warning lights, sirens, or both, as provided for in this act, and no lights or sirens shall be mounted prior to the issuance of the identification cards. Each chief or first assistant chief of a volunteer fire company shall carry the identification card while red emergency warning lights, sirens, or both, are displayed on his vehicle.

N.J.S.A. 39:3-54.19. Operation of motor vehicles with red emergency warning lights or sirens; yielding right of way

This act shall not grant to any chief or first assistant chief of a volunteer fire company any privileges or exemptions denied to the drivers of other vehicles, and persons displaying red emergency warning lights, sirens, or both, shall drive with due regard for the safety of all persons and shall obey the traffic laws of this State; but drivers of nonemergency vehicles upon any highway shall yield the right of way to the vehicle of any chief or first assistant chief of a volunteer fire company displaying red emergency warning lights, sirens, or both, in the same manner as is provided for authorized emergency vehicles pursuant to R.S. 39:4-92.

N.J.S.A. 39:3-54.20. Unlawful use of red emergency warning lights or sirens; penalty

Any person authorized to display red emergency warning lights, sirens, or both, pursuant to this act, who willfully displays or uses the lights or sirens in violation of the provisions of this act, shall be liable to a penalty of not more than \$50.00 and his privilege to display the lights or sirens may be suspended or revoked by the Director of the Division of Motor Vehicles.

PUBLIC EMPLOYEES OCCUPATIONAL SAFETY AND HEALTH BLOODBORNE PATHOGENS STANDARD

Many workers risk on-the-job contact with blood and other body fluids. These materials may contain pathogens (organisms that can cause serious disease). Of major concern are the hepatitis B virus (HBV), the hepatitis C virus (HCV), and the human immunodeficiency virus (HIV), the cause of Acquired Immunodeficiency Syndrome (AIDS).

On December 6, 1991, federal OSHA adopted 29 CFR 1910.1030. "Bloodborne Pathogens." This standard protects workers in the private sector who come in contact with blood or other potentially infectious materials. On July 6, 1993, the federal OSHA Standard was adopted under the New Jersey Public Employees Occupational Safety and Health (PEOSH) Act to protect public employees in New Jersey.

Note: This information bulletin provides a general overview of the New Jersey PEOSH Bloodborne Pathogens Standard. Consult the standard itself for complete information. This information was prepared for the New Jersey Department of Health and Senior Services, Public Employees Occupational Safety and Health Program by the University of Medicine and Dentistry of New Jersey, Robert Wood Johnson Medical School, Department of Environmental and Community Medicine, and the Division of Consumer Health Education.

The standard covers all public employees who may have contact with blood or other potentially infectious materials because of their work. Employees most likely to be covered include but are not limited to:

- Health care workers (e.g., medical and dental personnel, school nurses);
- Emergency medical services employees;
- Firefighters (including volunteers);
- Police officers;
- Correctional officers;
- Some laundry and housekeeping staff;
- Lifeguards;
- Workers in institutions for the developmentally disabled.

Potentially Infectious Materials

The standard defines other potentially infectious materials, such as semen and vaginal secretions; fluid from the brain, spine, lungs, and amniotic sac; fluid around joints, the heart, and the abdominal lining; saliva in dental procedures; all body fluids that are visibly contaminated with blood; and all body fluids when you cannot tell which type they are.

Also considered as potentially infectious materials are any unfixed human tissue or organs other than skin, and animals or cells infected with HIV for medical research. (Research laboratories for other bloodborne pathogens, such as hepatitis C, could also be included.)

How Are Employees Exposed?

Occupational exposures occur when employees do tasks that can cause blood or other potentially infectious materials to enter their bodies. These exposures happen through cuts, cracks, or abrasions in the skin; splashing, or spraying into the eyes, mouth, or nose; and puncture wounds from contaminated sharps (needles, broken glass).

Major Requirements of the Standard

The major requirements of the standard are as follows:

- Employee exposure control plan
- Methods to prevent exposure
- Hepatitis B vaccinations
- Medical evaluation and follow-up
- Employee training
- Recordkeeping

- Special precautions for HIV and HBV research laboratories. (Research laboratories for other bloodborne pathogens, such as hepatitis C, could also be included.)

The Exposure Control Plan. Employers must prepare a written plan that includes the job classification tasks and procedures in which employees have occupational exposure, the schedule and methods for implementing the requirements of the standard, and procedures for documenting the circumstances surrounding an employee's exposure. The plan must be accessible to employees. It also must be updated at least annually or more often if work tasks or control methods change.

Methods to Prevent Exposure. The standard describes the following methods to prevent occupational exposure to bloodborne pathogens:

- Universal Precautions—Handle all human blood or other potentially infectious materials as if they were contaminated. This approach is known as universal precautions.
- Engineering Controls—Use engineering controls whenever possible. These are methods that contain or remove the hazard, such as puncture resistant containers for sharps, splash guards, or self-sheathing needles, figure C-18.
- Work Practice Procedures—Use work practice procedures that reduce the chances of exposure. Employers must provide the necessary equipment to implement them. These procedures include:
 - Immediately wash hands (and other parts of the body as needed) following any contact with blood or other potentially infectious materials. This may not be possible for certain jobs, such as police work or emergency medical services. In these cases, employers must provide anti-septic hand cleansers, as well as paper or cloth towels. Employees must wash with running water and soap as soon as they can after the exposure.
 - Wash hands as soon as possible after removing gloves or other protective equipment.
- Do not recap, break, or bend by hand any contaminated needles. Put used needles and other sharps into special containers until they can be processed or disposed of, Figure C-25. These containers must be closeable, puncture-resistant, and leakproof. They should be labeled and put close to the area where sharps are used. Containers should never be overfilled.
- Do not eat, drink, smoke, apply makeup or lip balm, or handle contact lenses in areas where exposure might occur. Don't store food or drinks in potentially contaminated areas like refrigerators used to store lab specimens.
- Use methods to prevent splashing, spraying, or spattering when doing any procedures involving blood or other potentially infectious materials. Don't use your mouth for suctioning or pipetting.
- Use leakproof containers for collecting, handling, processing, storing, carrying, or shipping blood specimens or other potentially infectious materials.
- Label or use color codes on containers and refrigerators used for storage, carrying, or shipping. (See the standard for information on using the biohazard symbol.)
- Decontaminate any equipment before it is sent out for repair.
- Personal Protective Equipment – Wear personal protective equipment when exposure cannot be avoided by other means. This equipment includes gloves, face shields, goggles, gowns, lab coats, mouthpieces, pocket masks, and resuscitation bags, Figure C-19. Employers must provide the equipment free of charge. (They must also provide alternatives to employees who are allergic to the gloves normally used.) Personal protective equipment must be accessible and available in sizes to fit each employee. It should be taken off and put in designated containers for cleaning, repair, or disposal if it becomes contaminated or damaged.

Employers are required to clean and repair equipment that can be reused. This includes lab coats that are used as personal protective equipment.

• **Housekeeping Requirements** - These requirements include the following:

- Establish written procedures and schedules for regular cleaning of the worksite and for disinfecting contaminated surfaces and materials.
- Do not pick up potentially contaminated broken glassware. Use tongs, forceps, or a brush and dust pan. Only use containers made for storing, carrying, and shipping sharps.
- Handle contaminated laundry as little as possible and wear gloves (and other protective equipment, if necessary). It must be stored and transported in labeled, leak proof containers.
- Follow state laws for handling and disposing of regulated waste. Contact the New Jersey Department of Environmental Protection Bureau of Technical Assistance
PO Box 414, 120 South Street
Trenton, NJ 08625-0414
(609) 984-6985.



Figure C-25 Contaminated needles and sharps must be disposed of in special containers.

- **Hepatitis B Vaccinations**—Employers must offer free Hepatitis B vaccinations to all employees who have anticipated exposure to blood or other potentially infectious materials. The vaccinations must be given within 10 working days after employees begin jobs that have the potential for exposure. Employees may decline the vaccination, but must sign a "declination" statement if they do so.

- **Medical Evaluation for Exposed Employees:** Employers are required to offer free, confidential medical evaluation and follow-up to all employees who receive an occupational exposure to blood or other potentially infectious materials. These services must include: a written report of how the exposure occurred, testing the source person if possible, testing the exposed employee's blood if she or he consents, and post exposure treatment and counseling.
- **Employee Training About Potential Hazards:** Employers are required to provide initial training for employees who have anticipated occupational exposure. This training must cover all of the major parts of the standard and be repeated annually.
- Employees must also have access to a copy of the standard and the exposure control plan.
- **Recordkeeping** – confidential records about employee exposures, medical evaluation, and follow-up must be kept for the length of employment plus 30 years. Records showing that employee training has occurred must be kept for three years.
- **Special Precautions for HIV and HBV Research Laboratories:** Additional procedures, employee training, and equipment are required for HIV and HBV research laboratories. Consult the standard for details. See Table C- 1

Training Resources

Agencies and organizations with free or low-cost training materials about bloodborne pathogens are listed in Table C-2.



Figure C-26

Standard Precautions for Infection Control



WASH HANDS (PLAIN SOAP)

Wash after touching blood, body fluids, secretions, excretions, and contaminated items. Wash immediately after gloves are removed and between patient contacts. Avoid transfer of microorganisms to other patients or environments.



WEAR GLOVES

Wear when touching blood, body fluids, secretions, excretions, and contaminated items. Put on clean gloves just before touching mucous membranes and nonimpact skin. Change gloves between tasks and procedures on the same patient after contact with material that may contain high concentrations of microorganisms. Remove gloves promptly after use, before touching non contaminated items and environmental surfaces, and before going to another patient, and wash hands immediately to avoid transfer of microorganisms to other patients or environments



WEAR MASK AND EYE PROTECTION OR FACE SHIELD

Protect mucous membranes of the eyes, nose, and mouth during procedures and patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions.



WEAR GOWN

Protect skin and prevent soiling of clothing during procedures that are likely to generate splashes or sprays of blood, body fluids, secretions, or excretions. Remove a soiled gown as promptly as possible and wash hands to avoid transfer of microorganisms to other patients or environments.



PATIENT CARE EQUIPMENT

Handle used patient care equipment soiled with blood, body fluids, secretions, or excretions in a manner that prevents skin and mucous membrane exposures, contamination of clothing, and transfer of microorganisms to other patients or environments. Ensure that reusable equipment is not used for the care of another patient until it has been appropriately cleaned and reprocessed and that single-use items are properly discarded



LINEN

Handle, transport, and process used linen soiled with blood, body fluids, secretions, or excretions in a manner that prevents exposures and contamination of clothing and avoids transfer of microorganisms to other patients or environments.



***USE RESUSCITATION DEVICES
AS AN ALTERNATIVE TO
MOUTH-TO-MOUTH RESUSCITATION.***

Table C-1

SECTION C

New Jersey Department of Health and Senior Services

Public Employees Occupational Safety and Health (PEOSH) Program

CN 360, 7th Floor

Trenton, NJ 08625-0360

(609) 984-1863

The PEOSH Program has developed a model Exposure Control Plan which is intended to serve as an employer compliance guide to the Bloodborne Pathogens Standard. The model plan is available from the PEOSH Program at the above address or from our Internet site at <http://www.state.nj.us/health/eoh/peoshweb/>.

American Hospital Association Services, Inc.

PO Box 92683

Chicago, IL 60675-2683

(800)AHA-2626, Fax: (312) 422-4505

AHA has several publications of interest, including OSHA's Final Bloodborne Pathogens Standard: A Special Briefing.

Center for Disease Control

AIDS Clearing House

(800) 458-5231

Federal Emergency Management Agency (FEMA)

National Fire Academy

Publications Department

16825 S. Seton Avenue

Emmitsburg, MD 21727

(301) 447-6771

FEMA has a free curriculum for firefighters and emergency responders.

International Association of Fire Fighters

1750 New York Avenue

Washington, DC 20006

(202) 737-8484

IAFF has free materials for firefighters.

National Institute for Occupational Safety and Health

Attention: Publications

4676 Columbia Parkway

Cincinnati, OH 45226

(800) 356-4674

NIOSH has two publications that are especially useful: Guidelines for Protecting the Safety and Health of Health Care Workers, 1988. DHHS (NIOSH) Publication #88-119.

A Curriculum Guide for Public Safety and Emergency-Response Workers, 1989. DHHS (NIOSH) Publication #89-108.

Some unions and professional organizations have developed materials for their members. In addition, a few of the manufacturers of hepatitis B vaccine have prepared information.

Table C2

RIGHT-TO-KNOW

NEW JERSEY WORKER AND COMMUNITY RIGHT-TO-KNOW ACT

This fire service reference is designed to assist fire departments in complying with the regulations of the Worker and Community Right-to-Know Act and for personnel to understand their rights with regard to working with or around hazardous substances.

This information was developed with the invaluable assistance of the New Jersey Department of Health and Senior Services, Right to Know Program.

PURPOSE

The Worker and Community Right to Know (RTK) Act was signed into law on August 29, 1983 with the majority of the act taking effect on August 29, 1984.

The purpose of this law is to establish a program for the disclosure of information about hazardous substances in the workplace and in the community as well as provide public access to this information, Figure C-25.



Figure C27. Firefighters should remain aware of the types of facilities and their associated hazards that may be located in their districts.

Additionally, the legislature took note of the fact that local health, fire, police, emergency medical services, safety and other governmental officials required detailed information about the identity, characteristics, and quantities of hazardous substances used and stored in their communities in order to adequately plan for and respond to emergencies involving those materials.

There are two ways that a fire department will become involved with the Worker and Community RTK ACT, They are:

- As an employer (See Section 2)
- As a planner and responder to local emergencies (See Section 3)

WHEN DID THIS LAW TAKE EFFECT?

The Worker and Community RTK Act became effective in stages between 1984 and 1986. The Department of Health and Senior Services (DHSS) regulations were adopted on October 1, 1984 and have been amended several times since. In 1989, the education and training program regulations were amended to include volunteer fire departments, rescue squads and emergency medical services units. The date which all volunteers who work for these groups were to receive training was October 1, 1990. Subsequent to this date, volunteers were required to receive training within six months of joining the department or squad. Municipalities were made responsible for providing the training to these volunteers.

In 1993, the regulations were amended to explain the relationship of the training requirements of the Public Employees Occupational Safety and Health Standard for Hazardous Waste Operations and Emergency Responses to the training requirements of the Right to Know Act.

SECTION 1

The Law:

Worker and Community Right to Know Act L. 1983, c. 315, N.J.S.A. 34:5A-1, et seq.

Effective Date: August 29, 1984

Enforcing Agencies:

New Jersey Department of Health and Senior Services

Right to Know Program

P.O. Box 368

Trenton, New Jersey 08625-0368

(609) 984-2022

Right to Know regulations: N.J.A.C. 8:59

New Jersey Department of Environmental Protection

Bureau of Chemical Release Information and Prevention

P.O. Box 405

Trenton, New Jersey 08625-0405

(609) 292-6714

Right to Know regulations: N.J.A.C. 7:1G

New Jersey Department of Labor Division of Workplace Standards

PO. Box 386 Trenton, New Jersey 08625-0386

(609) 292-7036

SECTION 2

The Fire Department as an Employer

Depending on how it is organized, a fire department may be responsible to ensure compliance with the Right-to-Know law if the fire department is part of the municipality, a fire district or private employer:

- Completing and submitting a RTK Survey
- Maintaining Hazardous Substance Fact Sheets (HSFS) and Material Safety Data Sheets (MSDS) for all hazardous substances at the workplace in the RTK central file
- Labeling all containers in the workplace
- Providing RTK training for all employees

- Providing RTK training for
- Posting the RTK poster.

If the fire department is an independent private employer, it is the municipality's responsibility to ensure that all employees receive RTK training. The requirements of a RTK survey, RTK central file, RTK labeling and RTK poster do not have to be met at the facility of a private fire department.

Completing and Submitting the Right to Know Survey

If the fire department is considered part of the municipality or fire district, then the municipality or fire district is responsible for completing the RTK survey. If the fire department is considered a private employer, it is not responsible for completing the RTK survey.

How Do I Determine Who Is Responsible?

If you are not sure if the fire department, the municipality or the fire district is the employer, check with the municipal clerk or the fire district administrator, the municipal or fire district attorney, or the local ordinance that created the fire department.

Right to Know Survey

All employers in the public sector are required to complete a RTK Survey developed by the DHSS every year. A complete inventory of products containing hazardous chemicals present at the fire house must be reported every five years. In the intervening years, only new products have to be reported.

Do I Have to Ask for a Right to Know Survey?

No. The New Jersey DHSS will automatically send all public employers a RTK Survey. A volunteer private company that owns its own building will not receive a survey and does not have to fill one out. However, if you do not receive a survey and need one, you may request a survey from the DHSS at the address listed on this page.

What Should a Fire Department do if it Receives a Right to Know Survey?

A fire department that is covered under the law will receive a RTK survey with its name and address preprinted on the survey. The list of hazardous substances required to be reported should already be present in the RTK central file.

The municipality or fire district has each hazardous substance listed on the RTK Hazardous Substance List (RTKHSL) which is present at its facilities. The information to be included on the survey includes the product name and a list of hazardous substance ingredients by:

- RTK Substance Number (see RTKHSL)
- Hazardous Chemical Name
- Chemical Abstracts Service (CAS) Number (see RTKHSL)
- DOT Identification Number (see RTKHSL)
- Type of container (using code), Figure C-2
- Mixture percentage (using a code)
- Inventory quantity (using a code)
- Whether it is a solid, liquid or gas
- The number of employees exposed or potentially exposed to the chemical
- Special health hazard codes, if any
- Location (required only for large quantities at a single location)

How Do I Figure Out What Must Be Reported?

Consult the RTK instruction booklet that came with the RTK survey and the RTKHSL. This booklet and the list will provide the information needed for completing the Survey.

Who Do I Send the Survey To?

Send the original survey to NJDHSS, and copies to the local police department, health department, RTK county lead agency and the Local Emergency Planning Committee. Keep a copy in your RTK central file.



Figure C-28



Figure C-28B: Hazardous substances are stored or transported in a wide variety of containers.

II. Maintaining Hazardous Substance Fact Sheets and Material Safety Data Sheets for All Hazardous Substances at the Workplace in the Right to Know Central File.

What Is a Hazardous Substance Fact Sheet (HSFS)?

Once the fire department has submitted a completed survey for each of its facilities, the DHSS will send a HSFS for each hazardous substance reported on the RTK Survey. A sample fact sheet is found in Appendix D. The HSFS contains the following information:

- Chemical name, Chemical Abstracts Services (CAS) Number, DOT number, and other names (synonyms) that the hazardous substance is known by.
- Definitions and common questions and answers.
- How to identify the number.
- Solubility in water, vapor pressure and flash point.

- Toxicity, carcinogenicity, mutagenicity, teratogenicity, flammability, explosiveness, corrosivity and reactivity (including with water).
- A description in non-technical language of the acute and chronic health effects from exposure to the chemical, including medical conditions that may be aggravated by exposure.
- Potential routes and symptoms of exposure.
- Proper precautions, work practices, necessary personal protective equipment, and other necessary measures for safe handling and storage.
- Information on how to control and extinguish a fire that involves the hazardous substance.
- Appropriate emergency and first aid procedures for spills, fires, explosions and accidental air emissions.

What Should We Do with the Hazardous Substance Fact Sheets?

If a fire department has reported any hazardous substances present at its facilities, it must maintain the fact sheets in a central file, and make them available to all employees. This will allow firefighters and other employees access to information that is very specific to the hazardous substances that are present at the worksite. Additionally, the fire department may request an entire set of 1,055 HSFS for free from the DHSS for emergency response purposes. Page 6 of the fact sheet is specially prepared to provide important information to firefighters. The fact sheets are also available on <http://www.state.nj.us/health/ems/index.html>. Contact the DHSS for further information.

What Is the RTK Central File?

If the fire department has reported any hazardous substances present at its facilities, it is required to establish and maintain a central file at each facility containing a completed RTK Survey, appropriate HSFS and MSDS, and the RTK Hazardous Substance List.

Right to Know Poster

Every fire department is required to post on a bulletin board readily accessible to its employees, a poster giving notice of the availability of the RTK survey, HSFS, MSDS, and the RTK Hazardous Substance List for those substances found at the fire station. The poster can be obtained from the DHSS.



Figure C-29. Exterior product labels may not indicate correct contents of the container.

III. Labeling All Containers in the Workplace

A pamphlet explaining RTK labeling requirements is available from the DHSS. In general, all containers in the workplace must be labeled. There are exemptions for certain consumer products and products labeled according to certain federal labeling laws (such as for pesticides, Figure C-29). Labeling information can be found in Appendix VI. Contact the DHSS for further information if needed.

IV. Providing Right to Know Training for Firefighters

What Type of Training Is Required for Firefighters?

All municipal, county, and state employers, including fire districts, must develop an education and training program to inform all employees who are exposed or potentially exposed to hazardous substances of the hazards of those substances and of the provisions of the Worker and Community RTK Act. All firefighters, both paid and volunteer, are considered employees and are considered potentially exposed to hazardous substances in their work. Paid firefighters must receive RTK training within one month of hire. Volunteer firefighters must receive RTK training within six months of acceptance and both paid and volunteer firefighters must receive refresher training every two years. Fire departments may want to check with their municipality or fire district to see if an existing program already exists. Information on training and education requirements can be found in Appendix VI.

Municipalities are required to certify on their Right-to-Know survey, every year, that new paid

and volunteer firefighters have received initial Right to Know training that year, and to certify, every other year, that existing paid and volunteer firefighters have received refresher Right to Know training within the prior two years. (N.J.A.C. 8:59-6.1(d))

A similar training requirement for paid and volunteer firefighters exists under the Hazardous Waste Operations and Emergency Response Standard (pursuant to the New Jersey Public Employees Occupational Safety and Health Act), 29 CFR 1910.120(q)

In order to prevent duplication of training, the Right to Know regulations allows much of the 1910.1204 training to substitute for Right to Know training. The regulations say:

- Firefighters will be in compliance with Right to Know training requirements by taking the New Jersey Haz-mat Emergency Response Course—Awareness, and the New Jersey Haz-mat Emergency Response Course—Operations (using the manual dated May 10, 1990 or later), both developed by a committee under the auspices of the New Jersey State Police, Office of Emergency Management.
- In addition, firefighters should receive training on any hazardous materials in the firehouse which do not fit within the solid article or consumer product exemptions, if not already covered in other training.
- Training in the use of personal protective equipment must be given if not covered in other training, Figure C-30.
- Instructors must provide documentation to the fire company that they are "technically qualified persons" and a signed attendance roster must be maintained at the firehouse.
- (Biennial) Right to Know training can be combined with the annual refresher training required by 29 CFR 1910.120(q), however, "demonstrated competency" will not be allowed as a substitute for Right to Know (biennial) training.
- A Right-to-Know brochure must be distributed to all firefighters during the (biennial) training course.
- Awareness and Operational courses developed by other organizations may be used in place of the State Police program for Right to Know compliance upon submission to and approval by the Department of Health and Senior Services, Right to Know Program.



Figure C-30. An example of hazardous material personal protective equipment.

Maintenance of Right to Know Records

Training records are required to be maintained by the employer. Fire departments should check with their municipality or fire district to determine where training records will be maintained. Information about the training records that must be maintained can be found in Appendix VI.

SECTION 3

The Fire Department as a Planner and Responder to Emergencies

Right to Know Surveys

All fire departments will receive copies of RTK Surveys completed by public employers and Community RTK Surveys completed by private employers for facilities located within their jurisdiction every year. The surveys tell what hazardous chemicals are present at those facilities, their quantities and locations, and their DOT Guidebook number from the Emergency Response Guidebook, Figure C-31.

What Should a Department Do With the Right to Know Surveys That it Receives?

Fire departments should use both the RTK surveys and Community RTK surveys to help develop an emergency operations plan for facilities within its jurisdictions that report having hazardous substances. A sample Emergency Operations Plan (EOP) is available from the NJ State Police, Office of Emergency Management. HSFS are available from the DHSS for the hazardous substances reported on the surveys. You may request a complete set of HSFS from DHSS.

How Do You Use a Hazardous Substance Pact Sheet or Material Safety Data Sheet?

The fire department may maintain a file of the complete set of 1,055 HSFSs or MSDSs which it receives from certain reporting facilities, or both. This will allow firefighters to look up specific information on hazardous substances for any facility that they may be required to respond to. The HSFS and MSDS information can also be used in training and can be carried on apparatus or otherwise made available to officers during an incident.

If a firefighter is subject to hazardous chemical exposure during an incident, the HSFS and MSDS can be used in diagnoses and treatment at the hospital and in subsequent medical monitoring. Fire departments should drill their firefighters and officers in the use of RTK surveys, community RTK surveys and the accompanying HSFS and MSDS so that all are familiar with how to locate chemical information as well as the pertinent response information required during an emergency.

Drills could both be in-house and practical evolutions using hazardous substance scenarios that would require the use of surveys as well as HSFS and MSDS. Walkthroughs of specific facilities to confirm the information on the surveys and check container labels would also be beneficial.



Figure C-31. A Fire Officer consulting the DOT *Emergency Response Guidebook*.

HAZARD COMMUNICATION STANDARD

PEOSH ADOPTS THE HAZARD COMMUNICATION STANDARD (N.J.A.C. 12:100-7)

The purpose of this bulletin is to inform public employers and employees that the federal Hazard Communication Standard, 29 CFR 1910.1200, has been adopted with amendments under the New Jersey Public Employees Occupational Safety and Health Act, at N.J.A.C. 12:100-7. The Standard overlaps with the New Jersey Worker and Community Right to Know (RTK) Act, N.J.A.C. 8:59, administered by the Department of Health and Senior Services Right to Know Program in the area of education and training of public employees. In order to prevent public employers from being subjected to two sets of rules regarding education and training, certain provisions of RTK education and training have been added to the Hazard Communication Standard and all education and training requirements are being removed from the RTK rules. This bulletin provides an overview of the Public Employees Occupational Safety and Health Program (PEOSH) Hazard Communication Standard (HCS) and explains the public employer's responsibilities under the Standard.

BACKGROUND

On January 11, 2001, the US Department of Labor, Occupational Safety and Health Administration (OSHA) approved New Jersey as a State-Plan State for public employees only. In accordance with the federal OSHA-approved PEOSH State Plan, New Jersey must operate an occupational safety and health program that is at least as effective as the federal program. Therefore, the New Jersey Department of Labor (DOL), PEOSH Program, has adopted the Hazard Communication Standard (HCS) with amendments to bring New Jersey's regulatory requirements and standards in line with OSHA requirements.

PEOSH HCS AND THE RIGHT TO KNOW ACT

OSHA adopted the federal Hazard Communication Standard in 1983, after the New Jersey Worker and Community Right to Know (RTK) Act had already been enacted. The *public sector* was not covered *under the*

federal OSHA Standard, but was covered by the RTK Act. As a result of New Jersey's OSHA-approved State Plan and the adoption of the Hazard Communication Standard by the PEOSH Program, *public employers are now required to comply with both the PEOSH HCS and the RTK Act.*

All references to RTK education and training are being removed from the RTK rules while certain provisions have been added to the federal Standard to create the PEOSH HCS. The New Jersey Department of Labor and Department of Health and Senior Services agreed to this change in order to eliminate confusion among public employers regarding the need to educate and train employees about hazards in the workplace.

Public employee training will now be solely enforced under the Hazard Communication Standard adopted by the PEOSH Program. The PEOSH HCS amendments are listed below. It is strongly recommended that you read the PEOSH HCS and Appendix E of the PEOSH HCS in its entirety to become familiar with all of the Standard's requirements.

PEOSH Hazard Communication Standard Summary of Amendments

- N.J.A.C. 12:100-7.3 new definitions added: Hazardous Substance Fact Sheet (HSFS); RTK Hazardous Substance List (RTK HSL); RTK Survey; Technically Qualified Person; Workplace Hazardous Substance List; Workplace Survey
- N.J.A.C. 12:100-7.8(a) refresher training must be provided every two years, during regular working hours, and at no cost to employees
- N.J.A.C. 12:100-7.8(a) chemical specific information must be made available to employees through HSFSS I N.J.A.C. 12:100-7.8(b)(3) employees must be informed of the location and availability of HSFSS, the RTK Survey, and the RTK HSL
- N.J.A.C. 12:100-7.8(c)(5) training must include an explanation of applicable provisions of the RTK Act (RTK Survey, RTK HSL, labeling, HSFS, central file, poster)

- N.J.A.C. 12:100-7.8(c)(6) a copy of the RTK brochure must be provided to employees
- N.J.A.C. 12:100-7.8(d) a "technically qualified person" must be used to conduct training
- N.J.A.C. 12:100-7.8(e) a list of the items to be included in training records
- N.J.A.C. 12:100-7.8(f) training records must be maintained
- N.J.A.C. 12:100-7.8(g) an employer is required to make available all training records
- N.J.A.C. 12:100-7.8(h) training materials must be appropriate in content and vocabulary to the educational level, literacy, and language of employees

WHO IS COVERED?

The PEOSH HCS applies to all public employees in New Jersey who use or store hazardous chemicals or products containing hazardous chemicals. A hazardous chemical is defined as a chemical which is a physical hazard or a health hazard (See N.J.A.C. 12:100-7.3). Refer to the PEOSH HCS for sources of information that are used to identify hazardous chemicals, N.J.A.C. 12:100-7.4, and those products to which the PEOSH HCS does not apply, N.J.A.C. 12:100-7.2(f).

PURPOSE OF THE HAZARD COMMUNICATION STANDARD

The purpose of the PEOSH HCS is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information regarding the hazards of the chemicals is passed on to employers and employees. Under the PEOSH HCS, communication of the hazards of chemicals is achieved through a comprehensive hazard communication program which includes:

- A written hazard communication program;
- Container labeling and other forms of warning;
- Use of Material Safety Data Sheets (MSDSs) and HSFs; and
- Employee training.

The evaluation of chemical hazards is the responsibility of manufacturers and importers. **Employers who use hazardous chemicals must comply with the parts of the PEOSH HCS that require development and maintenance of a written hazard communication program and the communication of the hazard information to their workers.**

EMPLOYERS WITH LIMITED PEOSH HCS COVERAGE

Sealed container operations and laboratories have limited coverage under the PEOSH HCS. These limitations are explained below and are found in N.J.A.C. 12:100-7.2.

1. Chemicals in sealed containers—

Employees who handle hazardous chemicals in sealed containers which are not opened under normal conditions of use, such as in warehouses and transportation facilities, are exempt from the full requirement of the Standard, but the employer is still required to:

- Ensure that labels are not defaced or removed from incoming containers;
- Obtain and maintain Material Safety Data Sheets (MSDSs) and make them readily accessible to employees in their work areas during each workshift; and
- Provide information and training for employees, except for the location and availability of the written hazard communication program, so they know how to protect themselves in the event of a chemical spill or leak from a sealed container.

2. Laboratories—Employers are required to perform only the following under the PEOSH HCS:

- Ensure that labels are not defaced or removed from incoming containers;
- Obtain and maintain Material Safety Data Sheets (MSDSs) and make them readily accessible to employees in their work areas during each workshift; and
- Provide information and training for laboratory employees in accordance with the PEOSH HCS, except for the location and availability of the written hazard communication program.

For laboratories covered under the Occupational Exposure to Hazardous Chemicals in Laboratories Standard, 29 CFR 1910.1450 (laboratories where chemical manipulations are carried out on a "laboratory scale," multiple chemical procedures or chemicals are used, the procedures involved are not a part of a production process, and protective laboratory practices and equipment are available and in common use), the requirements of the PEOSH HCS are superseded. In this case the more specific Standard 29 CFR 1910.1450 applies. However, these laboratories are still required to comply with the provisions of the RTK Act.

Note: Laboratory employers that ship hazardous chemicals are considered to be either chemical manufacturers or distributors. They must, therefore, ensure that any containers of hazardous substances leaving the laboratory are labeled as required by the PEOSH HCS, and that an MSDS is provided to distributors and other downstream employers as required by the PEOSH HCS.

PROVISIONS OF THE PEOSH HCS

1. Chemical hazard evaluation
2. A written hazard communication program
3. Container labeling and other forms of hazard warning
4. Preparation, distribution, and maintenance of Material Safety Data Sheets (MSDSs)
5. Development and implementation of employee information and training programs
6. Trade Secrets

Each provision of the PEOSH HCS is summarized below. For a more detailed explanation of each provision, review a copy of the standard N.J.A.C. 12:100-7, available from the PEOSH Program at the address listed on page 6. The standard may also be obtained from the website listed in the box below.

Note: The PEOSH Program has developed a document, "Public Employer's Guide and Model Written Program for the Hazard Communication Standard," to assist public employees in complying with the PEOSH HCS. A sample written program is included in this Guide. If you choose to use the model written program provided, it must be adapted to reflect policies and work practices at your specific workplace. To obtain a copy, visit our web site www.nj.gov/health/eoh/peoshweb, or call 609-984-1863.

Hazard Evaluation

Each hazardous chemical must be evaluated for its ability to cause adverse health effects and its potential to cause physical hazards, such as flammability, based on established criteria for defining a hazardous substance. Conducting this hazard evaluation is a responsibility of the producers, importers, and distributors of hazardous chemicals. This section may not apply to public employers unless you create or ship hazardous chemicals to others. **The majority of public employers will only need to focus on items 2-6 above under "Provisions of the PEOSH HCS."**

Written Hazard Communication Program

All employers must develop and maintain a written hazard communication program at each workplace. The employer must describe in the program how the PEOSH HCS requirements for labeling, training, and MSDSs will be met. The written program must be made available upon request to employees, the employees' representative, the Commissioner of the New Jersey Department of Labor and the Commissioner of the New Jersey Department of Health and Senior Services or their designees. The written Program must contain, at a minimum:

1. **A list of hazardous chemicals** in the workplace;
2. A description of how employees will be informed of the hazards of non-routine tasks and the hazards of chemicals contained in unlabeled pipes;
3. Information about the availability of MSDSs and HSFSSs and methods to provide access to MSDSs and HSFSSs;
4. A description of container labeling and other forms of warning;
5. A description of the employee training program;
6. Procedures for training new employees initially, when new products are introduced, and for refresher training;
7. Methods for providing hazard information and protective measures to other employers on site who may be exposed.

A list of hazardous chemicals (List) must be compiled using the identity of the hazardous chemical or product that appears on the container and MSDS. The PEOSH HCS is a performance-based Standard. It allows the public employer flexibility in using existing lists of hazardous chemicals, such as the RTK Survey, to comply with the requirements to compile a list of hazardous chemicals. **The public employer has the option under the PEOSH HCS to develop a separate List to be included in the written Program or to use their RTK Survey as the List.**

The employer must be certain, however, that their RTK Survey contains all of the hazardous chemicals in the workplace if it is to be used as the required list. This would require them to have a complete inventory RTK Survey. They can also attach a supplemental page to the RTK Survey listing any hazardous substances that may not be on their RTK Survey to comply with the PEOSH HCS.

HCS Labeling Requirement and Other Hazard Warnings

Products containing hazardous chemicals must be labeled to inform employers and employees of the hazards associated with the product or chemical. **Chemical manufacturers, importers, and distributors** must label, tag or mark containers with the identity of the hazardous chemicals contained in the product and must show hazard warnings to protect the employee. The identity of the hazardous product must correspond to the name listed on the MSDS for that product. The warning may be in the form of words, pictures, or symbols, and must be legible and prominently displayed. Any target organs affected by the product or chemical must be identified. The name and address of the manufacturer or importer must also be included on the label.

Under the PEOSH HCS, public employers are required to make certain that the chemical products entering their facility are labeled and the labels are not defaced or removed. Generally, the employer receives the product or chemical already labeled by the producer based on OSHA HCS labeling requirements. In addition, public employers must check that the product is labeled according to the PEOSH HCS and the RTK law. Public employers must comply with the labeling requirements of both PEOSH HCS and the RTK Act. Refer to the PEOSH HCS for specifics on container labeling. N.J.A.C. 12:100-6.6.

Material Safety and Data Sheets

Employers must obtain and maintain an MSDS for each product containing hazardous chemicals. The MSDS is an informal bulletin that describes in detail: the physical and chemical properties, physical and health hazards, routes of exposure, precautions for safe handling and use, emergency and first aid procedures, and control measures for the hazardous chemical or product. It is provided to the distributor and employers who use the product or chemical.

Under the PEOSH HCS, public employers must obtain an MSDS for each hazardous chemical or product and make them readily accessible to employees in their work area during each work shift. If the RTK Central File provides the required accessibility for employees in their work area, it meets the PEOSH HCS

requirement.

If MSDSs are not received with a shipment of products containing hazardous chemicals, the public employer must contact the manufacturer for the missing MSDSs. A sample letter requesting an MSDS is included in the Public Employer's Guide and Model Written Program for the Hazard Communication Standard.

Employee Training

Employers must develop an information and training program for those employees who are exposed to hazardous chemicals under normal conditions of use or in a foreseeable emergency. Exposure means the employee comes in contact with the hazardous chemical during their job activities by any route of exposure (e.g., inhalation, skin absorption, or ingestion).

Under the PEOSH HCS, employees must be trained at the time of their initial assignment to work with hazardous chemical and when physical or health hazard is introduced into the workplace. This requirement differs from the RTK training requirement which allowed the employer 30 days to initially train the employee. Refresher training shall be provided every two years for all employees who continue to be exposed to hazardous chemicals. Refresher training is an abbreviated version of the initial training. The training must be provided during working hours and at no cost to the employee.

The public employer shall ensure that all employees participate in a training program conducted by **“a technically qualified person.”** A technically qualified person means, for training purposes:

- A person who is a registered nurse, Certified Safety Professional, or Certified Industrial Hygienist, or a person who has a bachelor's degree or higher in industrial hygiene, environmental science, health education, chemistry, or a related field, and understands the health risks associated with exposure to hazardous substances; or
- A person who has completed at least 30 hours of hazardous materials training and understands the health risks associated with exposure to hazardous substances, and has at least one year of experience handling hazardous or working with hazardous substances; or
- For teaching the recruit firefighting training course established by the New Jersey Department of Community Affairs (DCA), a

person who has fulfilled the requirements of Firefighter Instructor Level I as certified by DCA.

The definition of a "technically qualified person" can be found in the PEOSH HCS, at N.J.A.C. 12:100-7.3.

The PEOSH HCS information and training program must be appropriate in content and vocabulary to the educational level, literacy, and language of the employees in the training session and contain, at a minimum:

1. An explanation of the requirements of the PEOSH Hazard Communication Standard;
2. A description of operations in the work area where hazardous materials are present;
3. The location and availability of the written hazard communication program and other health and safety information (MSDS, HSFS, RTK HSL);
4. Details of the facility's hazard communication program;
5. An explanation of the applicable provisions of the RTK act (RTK Survey, RTK Labeling, HSFS, RTK HSL and Poster);
6. Methods used to identify and recognize hazardous materials in the work area (e.g. labels, MSDS, HSFS);
7. A discussion of the physical and health hazardous chemicals;
8. Control measures and specific procedures used to prevent exposure;
9. Standard operating procedures regarding the use, storage, and emergency clean up of hazardous chemicals; and
10. A copy of the RTK brochure.

Additionally, Hazardous Substance Fact Sheets (HSFSs) are required to be made available to employees for chemical specific information, N.J.A.C. 12:100-7.8.

Recordkeeping

Public employees' training records shall be maintained by the employer for the duration of the employee's employment, and shall be made available to the Commissioner of Labor or the Commissioner of Health and Senior Services or their designees for examination and copying. The training records shall be provided upon request for examination or copying to employees and employee representatives.

Training records shall include:

- Date of the training session;
- Location of the training session;
- Type of training (initial or refresher);

- Name and qualifications of the trainer;
- Names and job titles of the persons attending the training session;
- The content or summary of the training session.

Trade Secrets

Under the PEOSH HCS chemical manufacturers, importers, or employers are allowed to withhold the specific chemical identity of a hazardous chemical from an MSDS if certain conditions are met:

1. The trade secret claim can be supported;
2. The MSDS contains information on the properties and effects of the hazardous chemical;
3. The MSDS indicates that the specific chemical identity is being withheld as a trade secret; and
4. The specific chemical identity is made available to health professionals, employees, and designated representatives under certain specified situations.

In general, a request for the disclosure of a trade secret must be in writing and a statement to maintain the confidentiality of the disclosed information must be included in the request. The identity of a trade secret chemical must be released in cases of medical emergencies or first aid treatment regardless of the existence of a written statement. Review the PEOSH HCS for more specific details regarding the trade secret provision. Appendix D of the Standard provides the definition of a trade secret.

APPENDICES

There are appendices to the PEOSH HCS to assist employers with compliance. Appendices A (p. 176), B (p. 179), and D (p. 179) are mandatory. Appendix A provides definitions and an explanation of health hazards. Appendix B explains the criteria for evaluating hazards. Appendix D sets forth the definition of a "Trade Secret." Advisory information is provided in Appendix E (p. 180) to assist employers with compliance.

For Additional Information Contact:

NJ Department of Health and Senior Services
Public Employees Occupational Safety and Health Program
PO Box 360 Trenton, NJ 08625-0360
(609) 984-1863
<http://www.nj.gov/health/eoh/peoshweb>
NJ Dept. of Labor and Workforce Development
Division of Public Safety and Occupational Safety and Health
PO Box 386 Trenton, NJ 08625-0386/ (609)-6332587

SECTION C

REVIEW QUESTIONS

1. What is the difference between United States Federal OSHA and the State of New Jersey PEOSHA?
2. Describe the protective clothing that firefighters wear and its limitations.
3. Explain which departments of the New Jersey State government enforce standards and regulations pertaining to firefighters.
4. List the types of bloodborne pathogens that can threaten the health of firefighters.
5. What is the role of the Safety Officer at an emergency scene?
6. What do the terms, Mayday and LUNAR stand for?
7. How and why does a Firefighter issue a Mayday message?
8. Explain the evacuation signal regulation and its use as a fireground resource.
9. What is a Rapid Intervention Crew (RIC)? How is it utilized at an emergency incident?
10. List three reasons how a personal alert safety system (PASS) enhances the safety of firefighter.

PUBLIC UTILITIES, PROPANE AND CARBON MONOXIDE HAZARDS

SECTION D

INTRODUCTION

The following three chapters discuss the potential hazards associated with electric, natural gas, and propane facilities and carbon monoxide emergencies. What first responders do not know about utility hazards can and has killed them. It is vital that potential hazards associated with electric, natural gas, propane facilities, and carbon monoxide be integrated into your fire departments emergency standard operating guidance ("SOGs") and hazard assessments. These chapters on utility and energy safety provide a starting point for first responders to recognize and avoid potential utility hazards. It is strongly recommended that fire departments meet periodically with utilities and energy providers in their emergency response area to review capabilities and specific facility concerns and establish SOGs based on the specific potential utility and energy hazards in their area. The purpose of this program is to:

- help you to understand the properties of energy,
- give you a basic knowledge of how the utilities and energy systems work,
- make you aware of the hazards associated with those systems, and
- offer approaches for responding to utility and energy emergencies.

Utilities and energy services may be encountered while responding to virtually every emergency. The primary and first assessment focus is always life safety. When electric, natural gas, or propane facilities are involved, the only effective emergency response may be to secure the area,

protect nearby properties, and wait for the power or gas to be shut off or dissipate. Life safety includes your personal safety and that of the other first responders. The most difficult aspect of the emergency response may be waiting for the electricity, gas, or propane to be rendered safe before proceeding. Detection and utility emergency response equipment has to be calibrated, tested, and maintained to ensure that this equipment is safe and personnel are trained to use such equipment. Attempting to shut off the electric, natural gas, or propane facilities without the proper training, equipment, or experience may be fatal. Having the utility provider shutoff the power or energy is the safest approach. While the next three chapters will offer approaches for responding to emergency situations, not all potential hazards can be described. Only through training, experience, practice, and continuous learning will a first responder be able to remain safe and effectively manage an emergency. Many of the potential hazards may be hidden or not apparent at first. Being aware of the broad safety aspects of emergency response and careful evaluation of the specific emergency will reduce your exposure to these hidden hazards. It is hoped that these chapters will help you better understand and determine what precautions need to be taken when responding to utility and energy emergencies.

It is our fervent hope that you start your path as a first responder with the information, knowledge, and training needed to keep you and your fellow responders safe. The information in these three chapters is the first step on that path.

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Associated Electric & Gas Insurance Services Limited (AEGIS) was formed by the utility industry to serve the insurance and risk management needs of the utility and related energy industries. To that end, AEGIS Loss Control Services provides Member companies with a wide variety of products and services that help improve their operations and reduce their overall long-term cost of risk. The Hazard Awareness Training Programs, on which these chapters were based, "Recognizing and Avoiding the Hazards: A Training Tool for Emergency Responders," are an example of AEGIS Loss Control programs that are available for its Member companies. Staffed by former utility engineers and operating professionals, the AEGIS Loss Control team draws on real-life experiences to develop relevant solutions that help member companies avoid and mitigate losses. Please visit www.aegislink.com for more details.

The AEGIS materials are provided "as is" without warranties of any kind. Use of any AEGIS materials is at your own risk and AEGIS shall not be liable for any damages arising from their use.

CHAPTER I

RECOGNIZING AND AVOIDING THE HAZARDS OF ELECTRICAL EQUIPMENT

INTRODUCTION

Over the past years there have been many documented firefighter fatalities caused by electrocution. The purpose of this program is to:

- give you a basic knowledge of how electricity works,
- help you to understand basic construction,
- explain configurations of the electric utilities,
- make you aware of the hazards of electricity.

This chapter will help you better understand what precautions need to be taken when working around electrical equipment.

Electricity is invisible. When you look at an electric wire that could be energized from 120 volts all the way up to 500,000 volts, it seems harmless enough. That is why electrical energy is often referred to as the "silent killer" and remains a hazardous form of energy that has to be dealt with safely.

No matter what the voltage is in an electrical conductor, it is dangerous and can injure and/or kill emergency workers.

Some people believe that 120 volts (normal household current) is harmless. However, throughout the electrical industry there have been people killed when they have made contact with 120 volts. Any voltage can kill! It all depends on the situation, the amount of current involved, the part of the body affected, the duration of contact, and environmental conditions (wet or dry) at the time of contact.

Electricity is a blessing that is often taken for granted and must be treated with respect. *Electrocution is the fifth-leading cause of workplace death.* The majority of these fatalities are caused by the failure to recognize and avoid electrical hazards.

Solar Power or Photovoltaic (PV) as Alternate Electrical Sources

As Photovoltaic electrical systems become more popular (NJ is now the second largest market in the US) firefighters must become familiar with the hazards associated with alternate energy sources

during an emergency. Unlike traditional electrical systems that are connected to the power grid and can be de energized by disconnecting from the grid portions of a PV system are always energized.

For firefighters to gain a better understanding of PV electrical systems and their hazards go to the NJ Division of Fire Safety Website and review the power point program titled " Solar Power and its Effects on the Fire Service" at <http://www.nj.gov/dca/divisions/dfs/offices/training.html>

ELECTRICITY – THE BASICS

This section provides a general summary of electricity and electrical equipment. Key safety and tactical points are indicated.

Suppose nothing is coming out of a hose, but there is water under pressure inside it. If you open the valve, the force of that internal pressure releases a spray of water. An energized wire is similar. The force that causes electrons to flow is called voltage, and like water, the greater the pressure pushing electricity through a line, the higher the voltage. In water terms the pressure is measured in pounds per square inch. With electricity, pressure is measured in volts.

- Voltage is the electric force that causes the free electrons to move from one atom to another. Just as water needs pressure to force it through a hose, electrical current needs a force to make it flow. A volt is the measure of electric pressure. Voltage is usually supplied by a battery or a generator.
- Current is electricity in motion. It measures the amount of electrons that can flow through a material like a conductor. Electric current is measured in amperes, or "amps" for short. Amperes is like the amount of water flowing through a hose in a certain amount of time or the amount of electricity flowing through a wire.

- Resistance — The opposition to electrical current flow, measured in ohms.
- Conductors — These are made of materials that electricity can flow through easily. These conductors are made up of atoms whose electrons can move away freely.

Tactical Point If you discover someone who has made an electrical contact, do not attempt to pull the victim away from the source of contact with your hands. The power supply should be disconnected by the power company first. This may be done remotely by phoning the power company.

If someone is working from an elevated aerial apparatus and makes contact with an energized electrical conductor, do not climb onto the vehicle to lower the injured person by using the lower controls of the aerial apparatus until the power source has been de-energized or the aerial apparatus is clear of the electrical conductor.

The risk of electrical shock or contact can be reduced by:

- Being able to identify what a safe working distance from any electrical wires or equipment is.
- Maintaining a safe working distance from any electrical component

Some Examples of Conductors Are

- Copper Aluminum
- Platinum
- Gold
- Silver Water
- People and Animals
- Trees

Electricity will always take the shortest path to the ground. Your body is 70 percent water, and that makes you a good conductor of electricity. If a power line has fallen on a tree and you touch the tree you become the path or "conductor" to the ground and could be electrocuted.

- Insulators are the opposite of conductors. The atoms in these materials are not easily freed and are stable, preventing or blocking the flow of electricity.

Some Examples of Good Insulators Are

- Glass
- Porcelain

- Plastic
- Rubber

The rubber or plastic on an electrical cord provides an insulator for the wires. By covering the wires, the electricity cannot go through the rubber and is forced to follow the path on the aluminum or copper wires.

As mentioned above, electricity flowing through a conductor is similar to water flowing through a pipe.

If you take a water pipe with the faucet shut off, there is water in the pipe putting pressure (volts) on the pipe. However, there is no flow of water (amps) since the faucet is turned off. This is the same situation found in a home when the electrical wiring is connected to a TV or other appliance and the switch is turned off.

When the faucet is opened, water starts to flow (amps). The rate at which the water flows depends on two things:

The size of the pipe. (electrical comparison—resistance)

The pressure of the water. (electrical comparison—volts)

Once you have pressure (volts) and flow (amps) you have accomplished work (power watts). Just like the water that comes out of a faucet to fill a pot, water the lawn, and so on, the electricity is running the TV, VCR, lighting, and so on. Electric power is the term used for the product of the voltage and current in a circuit.

The length of time that you let the water flow will determine the gallons that are used; this is measured by the water meter. Likewise, the length of time the power is used is measured in watts by the electric meter and billed as a kilowatt-hour (1 kw = 1,000 watts).

Electricity is always trying to reach earth, which is ground, through the path of least resistance. In order to control electricity, insulators are used to isolate the energized conductors from all sources of ground potential. Air is a natural insulator; once an electrical arc has started, the air becomes ionized and is now contaminated. The arc will continue until it is interrupted.

Caution Consider all downed wires as **ENERGIZED** until the Utility representative confirms they are safe.

THE ELECTRIC SYSTEM

Generation

Electricity generating plants or power plants may be large or small, and generation is produced by several means: fossil, hydro, or nuclear. Appearance of the power plants differs, as does the equipment in the plant. However, there are certain conditions and equipment that are somewhat common to all power plants, such as the turbine, boiler, condenser, and electrical switch rooms.

The voltage that is produced by the generators is stepped, or raised up, through the use of power transformers to levels used to transmit the power by electrical transmission lines to locations miles from the generating stations. These transmission line voltages range from 115,000 to 500,000 volts. Transmission line towers are usually 100 to 200 feet high and run in a straight line along utility right of ways. In most cases, the wires with the highest voltage are those at the tops of utility poles. Keep in mind that most poles also have other utility wires, such as telephone and cable.

The electrical power is carried great distances on these towers to large substations. An electric substation performs one or more of the following functions: (1) It transforms electric energy from one voltage to another, (2) it serves as a control center and switching facility, and/or (3) it serves as a center for distributing electric energy to end-use customers.

Substations can be classified into three categories: inside, outside, and a combination of both. Some are hidden from site by constructing a three-sided house around the station.

All substations contain electrical equipment, which are insulated with mineral oil, and/or pressurized insulating gas, such as sulfur hexafluoride (SF-6).

At these substations the voltage is stepped down, again by the use of power transformers, to 34,500 volts. The 34,500-volt electrical conductors are carried to smaller substations on high utility poles ranging from 60 to 90 feet in height that run along power right of ways.

At these smaller substations, the voltage is once again reduced, this time to the primary voltage level (2,400 to 19,900) volts. These conductors are carried on smaller utility poles (40 to 50 feet in height) along residential streets.

The first objective of fire personnel is to size-up and communicate as much information to the utility as possible. Transmission substations, located with generating stations, are used to step-up the voltage from the generator; for example, 24,000 volts up to the transmission voltage of 115,000 volts or higher.

Distribution substations are located throughout communities; it steps the voltage down for distribution throughout neighborhoods. Distribution voltage may vary from 2,400 to 34,000 volts.

In order to reduce the voltage for residential use, there are transformers located on these poles that step the voltage down to 120 volts. This is the voltage that is carried on the wire running from the utility pole to the weatherhead connection on the residence.

As you turn on a light switch in your home the electrical power is transmitted to the light bulb. Electric utility primary (higher voltage) lines contain 0 to 500 amps and their secondary (household current) lines contain 60 to 400 amps. Even though the voltage is lower in household currents the amperage is the same or higher than in higher voltage lines. There is enough amperage in secondary lines to cause serious injury or a fatality if contact is made.

At the top of a utility pole are the power company's primary conductors. These conductors may be bare or covered with non-insulated weather jackets. The voltage in these conductors could range from 2,400 volts to 19,900 volts. There could be one to four wires at this location on the pole at this location on the pole.

The next area down from the primary location is the power company's secondary conductors. The voltage in these conductors is usually 120 volts in and as high as 480 volts in industrial areas.

Voltage in the primary lines usually is 2,400 volts to 19,900 volts and secondary voltages range from 120 volts to 480 volts (Figure 1-1).

Insulators are made from high di-electric or insulating materials, such as glass, porcelain, polymer, plastic, and so on. Insulators provide a mechanical means of clearance to prevent voltage from tracking to ground or another energized phase.

The number of insulators ganged, or joined together at any given point may give you a general indication of the voltage level. The more insulators on a single string, generally the higher the voltage.

Safety Firefighters should never enter a substation property unless accompanied by a utility representative.

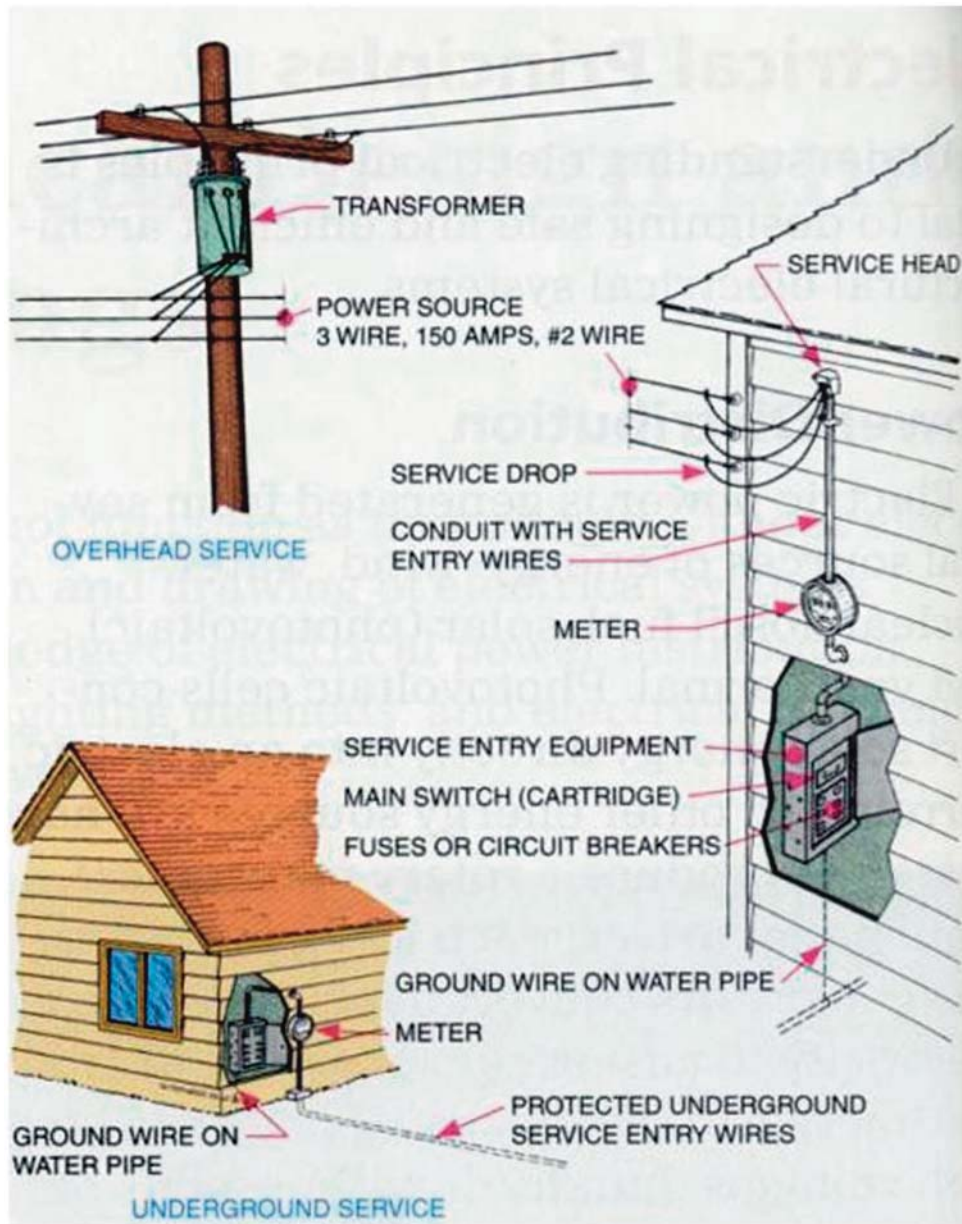


Figure D-1

Overhead electrical wires are all installed under strain. That is one of the reasons fire apparatus should be staged no closer than two pole lengths to either side of a pole that is involved in the incident. If a line under tension should snap it could recoil back for several hundred feet placing firefighters and fire apparatus in danger.

Pole-mounted equipment can contain mineral insulating oil; if there is a spill, immediately notify the electric utility, Figure 1-4. Extreme caution always should be taken during storm conditions. Downed power lines may or may not be energized.

A: Distribution power lines - generally are 23,000 volts – carry electricity from substations -- are located approximately 40 feet above ground.

B: Transformers – reduce high voltage to secondary voltage, are located approximately 35 feet from the ground.

C: Secondary lines – generally are 120/240 volts – carry electricity to homes and businesses -- are located approximately 32 feet from the ground.

D: Telephone/Cable Television Wires – generally about 20 feet from the ground.

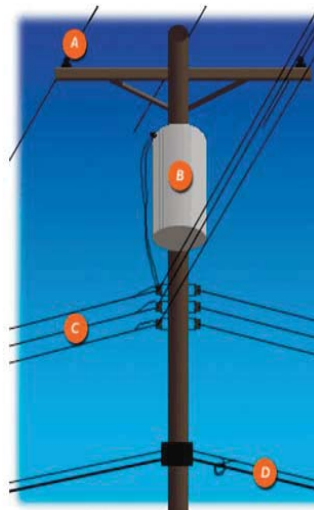


Figure 1-4: Pole top utility facilities.

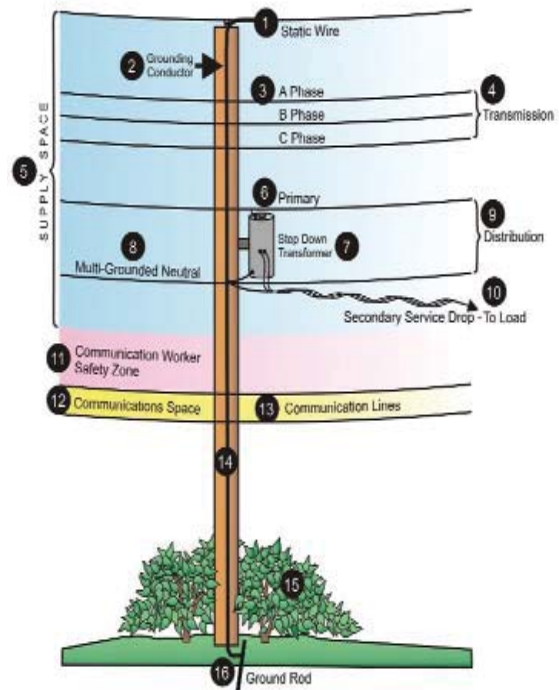


Figure 1-5 Secondary wires.

Safety Protect with diking techniques any water runoff area that could be affected by the oil spill. Do not attempt to wash away the oil spill.

Safety Never position yourself or an apparatus directly under a pole involved in the incident.

Positioning of aerial apparatus must be considered upon arrival: survey the area, locate overhead wires, and position the apparatus, maintaining a minimum of 10 feet from all overhead conductors.

Safety Consider all downed wires as ENERGIZED until the utility representative confirms they are safe.

Safety Do not take chances: call the local power company for help. During a storm, stay away from any downed lines.

Identifying the type of a downed wire (power, phone, fire alarm, or cable TV) is difficult when the lines are covered with debris, ice, or snow. Again, just stay away and call for help.

Whenever there is a downed energized electrical line, a phenomenon known as "step voltage" may be present on the ground around the fallen power conductor. The downed conductor may energize the ground causing a rippling effect around the point where it is making contact with the ground and the voltage decreases as you go out from the center of this point.

In a residential underground system, the power, gas, phone, and cable television companies all have underground cables in certain areas to serve their customers. The first sign that you might be in an underground area is that there are no utility poles around.

The voltages in the power company's underground systems are the same as their overhead systems.

Many times the power, phone, cable television, and even the gas company's lines and cables look alike and identification may not always be easy. Underground distribution lines are distribution lines that are directly buried underground to padmount transformer installations. The voltages can range from 2,400 volts to 34,500 volts. Pad mount transformers are locked and should only be handled or opened by a utility representative.

ELECTRICAL SHOCK

Electrical shock remains the greatest hazard in an electrical contact. Besides the pain that is suffered, there is often a loss of muscle control and continued contact could lead to a fatal injury.

Electric shock will occur when a person, by contacting an energized conductor or other energized objects, provides a path for the flow of electricity to a ground. Simultaneous contact with two energized conductors will also cause electric shock, which may result in serious injury or death.

When you unintentionally become part of an electrical circuit, current flows through your body, which could cause electrical burns and/or death.

The human body provides limited protection from electricity. The first line of defense is our skin, which has a high resistance to shock. Recall that resistance is measured in "ohms," and dry, unbroken skin can have up to 50,000 ohms in resistance. But inside the body, which is about 70 percent water, this resistance drops to only 300 to 500 ohms in resistance.

Anatomy of an Electric Shock

To measure the effect of electricity on the body, let's take common household voltage, 120 volts, and divide it by a resistance factor of 40,000 ohms, which is typical for human skin. The result of voltage divided by resistance is "amperes," the amount of current which flows through human skin. Only here, the amount is small, only 3/1000 of an ampere, or 3 milliamps of current.

- Resistance of the human body
- Voltage/Resistance = Amperes

Current (amps) plays a major part in the electrical shock killing factor. Voltage is important only because it determines how much current will flow through the resistance of the human body. The current necessary to operate a 10-watt light bulb is eight to ten times more than the amount that would kill the average person.

- Effects of current on body

1 milliamp or less--Causes no sensation and is not felt.

1 to 8 milliamps—Sensation of shock, not painful. Individual can let go at will, as muscle control is not lost (5 ma is the acceptable maximum harmless current intensity).

15 to 20 milliamps — Painful shock. Cannot let go. Muscle control is lost.

20 to 50 milliamps—Painful. Severe muscular contractions. Breathing is difficult.

100 to 200 milliamps— Ventricular fibrillation. A heart condition that could result in death.

The severity of a shock determines the severity of the injuries received. Three factors affect the severity of a shock:

Firefighter Fact a 7-watt night light draws 60 milliamps of current, enough to cause ventricular fibrillation.

Electric utility primary (higher voltage) lines contain 10 to 500 amps and their secondary (household current) lines contain 60 to 400 amps. Even though the voltage is lower in household currents the amperage is the same or higher than in higher voltage lines. There is enough amperage in secondary lines to cause serious injury or a fatality if contact is made.

1. **The amount of current passing through a body.** The higher the current, the more potential for injury. A current as little as 50 milliamps-50/1000 of an amp—can cause death.
2. **The path of the current through the body.** A shock that takes a path through one finger and out another finger on the same hand (such as when touching the prongs on a plug) might cause only a painful, temporary injury. However, the same current flowing through the chest can cause death through ventricular fibrillation.
3. **The length of time that current flows through the body.** Obviously, the longer the duration of a shock, the greater the potential for an injury.

Other Electric Hazards

Electric arcs or flashes are another form of an electrical hazard. Heat generated from an electrical flash could be as high as 43,000°F. This is equivalent to the temperature on the surface of the sun.

An electrical arc will occur when there is a fault on a line, usually caused by a tool or piece of metal equipment getting across the lines. The resulting electrical arc is similar to an arc weld.

Electrical arcs or flashes may also be the result of a failed or faulted piece of equipment.

Electrical burns are another form of an electrical hazard that results from contact with an energized conductor or from the heat generated from an electrical arc.

Firefighter Fact A small electric drill draws 1,550 milliamps. This is seven times enough current to burn you and 31 times enough current to cause your heart to go into ventricular fibrillation.

Caution Rain gear (jackets, boots, gloves, and so on) and firemen's turnout gear provide virtually no protection against electricity.

Electricity, because it cannot be seen, must be approached with extreme care. To assume that a wire is not energized could be a deadly mistake. Always assume the wire is energized until it is tested by a qualified person.

RESPONDING TO INJURIES

Anytime someone has been shocked there are any number of possible injuries that you may need to address: first, second, and third degree burns; broken bones from a fall due to electrical contact; and most seriously cardiac arrest. Once you are certain the victim is not still in contact with any' energized item (energized fence, ladder, car, etc.), you can then treat the victim accordingly.

When electrical shock traumatizes a nerve center in the brain, breathing often stops, and your response needs to be appropriate. Time is of the essence, but do not sacrifice yourself in the process.

When checking a victim for life signs remember not to move the victim unless he/she is in imminent danger. If no life signs are found (breathing or a pulse), treat the victim accordingly.

Current entering the body produces heat, which can cause damage at the entrance and exit points. Electrical burns are doubly dangerous, because tissues and organs beneath the skin may also be burned.

For any burn, the burning process must first be stopped. For a major burn where skin has been destroyed, apply dry sterile dressings.

When a powerful electrical current passes through the air or gas and reacts with particles in it, an intense arc can result, instantly emitting huge amounts of radiation and ultraviolet light. During a new arcing event exposed skin can be severely damaged, as if from an intense sunburn, as well as the eyes. By cooling the skin additional damage can be reduced. Superficial skin burns are treated like a sunburn, with cool compress.

Talk to the victim to assure him or her that you have things under control. Talking also helps to calm victims down and helps keep them from going into shock.

Safety Points to remember (electric contact):

- Electrical burns are another electrical hazard that results from contact with an energized conductor or from the heat generated from an electrical arc.
- Protect yourself from electric arcs or flashes, which are other forms of electrical hazard. Heat generated from an electrical flash could be as high as 43,000°F. This is equivalent to the temperature on the surface of the sun.
- An electrical arc will occur when there is a fault on a line, usually caused by a tool or piece of metal equipment getting across the lines. The resulting electrical arc is similar to an arc weld.
- Electrical arcs or flashes may also be the result of a failed or faulted piece of equipment,
- Electrical shock remains the biggest hazard from electrical contact. Besides the pain that is suffered, there is often a loss of muscle control; continued contact could lead to a fatal injury. Electric shock will occur when a person, by contacting an energized conductor or other energized objects, provides a path for the flow of electricity to a ground. Simultaneous contact with two energized conductors will also cause electric shock that may result in serious injury or death.
- Eye damage may not show up immediately, but symptoms to look for are burning and a sensation of sand irritation.

APPROACHING ENERGIZED AREAS

Overview

As a first responder, you are most likely to be on scene before the local electric company. Safety is extremely important.

Coordination between the first responders and the local electric company is extremely important. The safest way to make sure that a wire is de-energized is to have the on-scene representative from the electric company do the actual disconnection of the wire. The electric company will de-energize their facilities and

Caution All downed wires should be treated as if they were energized.

advise first responders that it is safe to proceed with their duties.

It is very important that the local electric utility be notified of any downed wires. Even if it is suspected that they are not electric lines (i.e., cable TV or phone), they could be energized due to a downed wire not in sight of your location. It is better to be safe than sorry by having the local electric company come out and secure it. Always consider all downed lines to be energized; contact the electric company and wait until they have given notice that it is safe to proceed.

Precautions When Approaching Downed Lines

A long-held misconception is that the rubber in the tires of vehicles will insulate you from electric contact. This is not true. Due to steel-belted radials, the tires can actually conduct electricity. The rubber protection that the utility uses is tested twice a year and is designed to protect against conductivity. The same goes with rubber fire boots or rubber rain boots. They are not designed to protect against electric shock.

Regardless of whether or not you know if the downed wire is Cable tv, telephone, or electric, you should always consider the wire to be live. You should never attempt to move it or handle it in any way. Let utility people do the work.

Circle of Safety

When approaching a downed wire, great care needs to be taken. A general rule of thumb is to maintain a minimum distance of 30 feet away. This is known as the "circle of safety." When in doubt, keep away and wait.

Storm Conditions

Extreme caution should always be taken during storm conditions. Downed power lines may or may not be energized. Do not take chances: call the local power company for help. During a storm, stay away from any downed lines.

Identifying the type of a downed wire (power, phone, fire alarm, or cable TV) is difficult when the lines are covered with debris, ice, or snow. Again, just stay away and call for help.

Whenever there is a downed energized electrical line, a phenomenon known as "step & touch" may be experienced while walking on the

ground around the fallen power conductor. Firefighter should pay particular attention to the possibility of this occurring and the ground becoming energized in the area of the downed power line.

VEHICLE RESCUE FROM DOWNED POWER LINES

Vehicle accidents involving utility poles are very common. In cases where energized lines land on the vehicle the best practice is to instruct the driver and occupants in the vehicle to remain in the vehicle and wait for the power company to arrive. Remember the circle of safety. Keep at least 30 feet away and try to keep the occupants calm.

If the vehicle is operational, instruct the driver to attempt to move the vehicle. There are a few safety points to remember. Keep all personnel far away until the car is at least 30 feet away from the downed line. One important factor to note is wire coil memory. This means that the wire that may be pinned under a tire, when released, will recoil back to where it is connected. Be very aware of this. Keep all personnel far away until the wire comes to rest and stops moving.

A vehicle on fire with a wire downed and people trapped inside can be a very dangerous situation. The first responder's initial reaction may be to rush right in to get the fire out and help the people. This can be fatal. **DO NOT USE WATER!** If you do this the water, hose, engine, and all personnel making physical contact to it can become energized. If you have a situation where you have to suppress the fire, use dry chemical extinguishers. Don't forget to keep a safe distance away from the vehicle. A dry chemical usually has a stream of about 15 to 20 feet. Therefore, when you're approaching, be very aware of your surroundings. Use a spotter/safety officer to keep extra eyes on the situation. Remember that foam has water in it, so it too, can become energized. If there is no one in the vehicle and it is on fire, let it burn. Protect exposures and wait for the electric company.

Once the fire is out, wait, the lines still may be energized; forgetting this may result in you becoming a victim or fatality.

Safety People in vehicles that may be energized should be told to remain in the vehicle.

Caution All downed wires should be treated as if they were energized.

Environmental changes can trigger fires in the passages and vaults housing electrical wires and equipment. If you detect signs of fire, but don't observe any workers, vehicles, or signs of work at the reported location, most likely no one is in the underground vault or manhole. Don't make any attempt to investigate further, but report what you have seen to the utility company. Once on sight, the utility company, after de-energizing the area, may need some assistance from the fire department to clear the smoke out from the chamber so they can enter it to make repairs.

When work is being done, as a rule, someone from the crew will always be above ground. Instinct may tell you to rush down into the chamber, but don't; you have no idea of what may be energized. Make sure the utility company has been notified, and wait for them to de-energize the area.

Once power has been shut off, the chamber can be entered with full protective equipment and breathable air supplied and monitored. All the rules for confined space entry must be followed, and extra caution has to be taken to avoid any sparking, such as from flashlights being turned on, or metal scraped, because of the possible presence of combustible gases. Explosions in these underground areas can result in the street level manhole/vault covers being blown in to the air. Firefighters should remain aware of this possibility.

ELECTRICITY IN BUILDING FIRES

Most electrical fires are caused by excessive heat from wires, machines, and appliances, which have been overloaded or poorly insulated. When fires break out in buildings, you're almost always exposed to energized electrical wiring and power lines.

Industrial facilities have heavy-duty electrical systems with equipment operating at over 10,000 volts.

Residential systems mostly have 120- and 240-volt service. While much lower than industrial voltage, it is still very dangerous. Here are some guidelines that should be followed at all times:

1. When you enter a building, you may want to keep power on to aid you in investigating the fire.

2. However, because visibility is usually limited, keep your palm, turned inward. Why? If you come into contact with any energized sources, and you experience muscle contractions, your arms and hands will be pulled toward your body, and away from the source of electricity. Many firefighters believe that when responding to fire emergencies, the pulling of an electric meter is an acceptable procedure. It isn't. Meters can arc and explode.

3. What you want to do if possible is locate the main breaker box, or panel, and shut off the power from there. When doing so, turn away from the power source to avoid being burned if it arcs.

All electrical wires should be approached as if they were energized. As shown earlier, while electrical wires are weather coated, don't make the mistake of thinking that means they are insulated. Firefighter gloves are not designed to handle energized electric lines. Don't be fooled into thinking it's safe to touch the lines — it's not. Nor is it safe to use any of your tools to cut power lines. This attempt to de-energize power to the burning structure is extremely dangerous.

Even after you have cut the power, take care not to come in contact with machinery or appliance especially in commercial and industrial facilities, as there may be alternate emergency sources still supplying electricity. When you're fighting any kind of fire with overhead electric lines in the area, special precautions need to be taken.

Dense smoke often has carbon particles and moisture in it, which can become energized and produce a potentially lethal arc. This guideline also applies to any equipment and tools you are using. Make absolutely sure you're keeping that safe distance before jumping into action. Because of these dangers, only essential crew members should be anywhere near vehicles exposed to this risk.

Large scale fires involving multiple vehicles and possible different companies and agencies compound the complexities in responding.

Firefighter Fact If a ladder or bucket extension needs to go over or near any power lines, a minimum safe distance of 10 feet from the energized line is required by OSHA regulations.

Caution Anyone working on the vehicle must avoid any contact with the ground because of the possibility of electrical arcing.

Safety A “prefire plan” should be in place to ensure that everyone is aware of the location of power lines and other electrical sources, so coordination of all parties’ actions creates a safe outcome.

When the utility company experts arrive, they will probably cut the service wire taps on the utility pole, or open a switch to cut power to the area. Only when they test to make sure all sources of electrical energy are removed will you get an all clear to move about safely.

SUBSTATION, PLANT, AND TRANSMISSION FIRES

An electric power substation has transmission and distribution lines coming in and out of it. Typically, some of the components include a control building, large transformers, structures to keep the lines elevated, and circuit breakers. Both transformers and circuit breakers are filled with oil, which insulates the internal electrical components. If a fire breaks out, the high voltage levels mandate special guidelines for responding safely.

Components of a Substation

The transmission and distribution substation consists of many components such as transformers, distribution breakers/reclosers, power circuit breakers, voltage regulators, reactors, capacitors, circuit switchers, switchgear, and switches that should be located and arranged in the substation yard in the most effective manner. The following subsections discuss the various aspects of the types of substation equipment used in the subtransmission and distribution substation.

Power Transformers

All substation-type power transformers are liquid-filled transformers. Most all transformers that are used are of the core form, circular coil winding

construction. In the core form type of construction, the transformer windings are surrounded by the core steel. The liquid is generally oil and may be flammable.

Power Circuit Breakers

A power circuit breaker is a device used to open or close an electric power circuit either during normal power system operation or during abnormal conditions. Circuit breakers used are vacuum, oil filled, or insulating gas filled.

Distribution Circuit Breakers / Reclosers

Interrupting devices used in the low voltage portion of a distribution substation consist of circuit breakers and/or circuit reclosers. These devices may use vacuum, insulating oil, or SF6 gas as the interrupting medium. Both devices are used to protect transformers, circuits, and other equipment in a distribution substation. Both have all relaying such as reclosing, phase, and neutral relaying included in their own control cabinet.

Control Buildings

Control buildings are generally deemed necessary when the installation of large batteries and relaying/control equipment on switchboard control panels is required for substation operation. Both transmission and distribution substations may have control buildings.

The purpose of switchboard panels or frames is to provide a convenient and vertical surface for mounting and wiring control, as well as protective equipment for the various line exits, transformer circuits, and transfer circuits located within a particular substation, Figures 1-7 and 1-8.

Under no circumstances should you attempt to enter the substation before the utility company experts are on the scene. Because of the high voltage and possibility of explosion, the danger zone is extended much further: a minimum of 300 feet.



Figure D-4 Substation Control Room



Figure D-5 Substation Control Room

Make sure your vehicles are parked at a safe distance, and be careful to avoid putting them underneath a power line. When utility company personnel arrive, they will provide guidance in approaching all the structures and equipment safely. They may decide to let the equipment burn itself out, while directing firefighters to protect exposures.

The utility company may de-energize only the affected section within the substation, choosing to keep as many customers as possible in service. Therefore, they will work with you to set up a safe corridor of operations, which avoids areas that will remain energized. Following the advice of electric power experts produces the safest outcome.

The equipment, which has most likely been severely damaged by fire, will not be repaired, and the utility company doesn't want anyone being injured in trying to rescue it. Therefore, unless it poses a wider threat, it will be left to burn itself out. However, if the heat is

Safety

Complete personal protective equipment for operating personnel should be mandatory including SCBA.

intense enough, other structural systems may collapse, so these exposures need to be protected.

Upon entering an area involved in an event of this nature, the responder needs to be immediately aware of the condition and presence of overhead conductors. The overhead conductors should therefore be considered to be energized until proven otherwise by the owner or utility personnel. Isolation at the point of the emergency should not be considered as sole evidence of safety as the conductors may be fed in both directions and therefore may be energized at any time. The best advice is to ensure that they are isolated from both ends by competent and authorized personnel.

Most often the fire is coming from oil in the circuit breakers or transformers. Because large amounts of oil are housed inside, it is a major concern, which requires special guidelines.

With equipment de-energized, the oil fires can be extinguished by using protein foam sprays and water fog streams. Never use a solid stream of water on oil or any pools of oil, which could actually spread the fire.

The fire may continue burning inside the equipment. Reignition is not uncommon, and the oil may burn for an extended period of time. Continued on and off burning could go on for days. Be aware that the oil vapors are also capable of exploding, so full PPE and safe distances from equipment need to be maintained. The high concentration of carbon particles that give the smoke its characteristic color will also conduct electricity from high-level energized equipment to the ground. Further, any firefighting operations will add to the conductivity by providing a steam component in the plume. Even dry chemical particles have been known to become conductive in high humidity environments by absorbing moisture and therefore acting like "airborne mud." Typically, this effect is seen between high-energy points such as exposed conductors or bushings on transformers.

Metal ladders should not be used, only ladders made of nonconducting materials. A good guideline to follow when inside the substation is to have no equipment extend beyond shoulder height, because any overhead equipment may be energized.

Caution

Another danger: because glass and ceramics are excellent insulators, this equipment, under intense heat, can explode when water is applied.

There are other hazards to be aware of, such as toxic gases that can arise from insulation or batteries, so it is best to limit the number of people involved to only the most essential and to confine the fire within the substation fence line.

Transmission towers

Transmission towers are constructed in "right of way" corridors that isolate them from traffic, construction, and trees. However, a large fire and smoke condition can extend upward far enough to present a different and dangerous scenario. Smoke contains carbon and carbon is a conductor of electricity. At a distance of approximately 6 feet, with enough heat, the particles of smoke can trigger arcing, with an intense burst of electrical energy flashing to the ground. Therefore, when you recognize these conditions forming, put at least a hundred feet of distance between you and the fire.

Generating stations

Generating stations that burn fossil fuels to produce electricity rely on you to bring fire emergencies under control. If such a facility is in your coverage area, you need to be meeting with the

Safety Pre-fire plans include plant layout: know where chemical and oil tanks are located, as well as hydrant and fire pump locations.

utility company to discuss emergency preparedness to deal with possible dangers associated with the generation plant.

Inside these generating stations you could encounter hazards from water, steam, natural gas, and toxic substances. If a fire starts at a generating plant, you will be met by a utility company specialist. This person will work with you to make sure that all of the contingencies you have discussed for this situation are addressed so that the safest course of action can be followed in a dangerous situation.

Power plants

Power plants use some of the same equipment as found in a substation. The same guidelines apply in carrying tools and equipment: be sure to keep everything at shoulder height or below.

Electric Dos and Don'ts

DO

- Treat all utility lines as high voltage.
- Look for overhead lines when arriving at emergency scenes.
- Check for and avoid utility lines on the ground, in trees, or on vehicles.
- Notify the electric utility when there are downed lines or other electrical problems.
- Beware of step voltage and keep at least 30 feet away from downed lines.
- Have occupants remain in vehicles that are in contact with downed lines until the "all clear" is given by the electric utility.
- Instruct occupants of energized vehicles to jump clear and hop away from their vehicles.
- When utility electrical equipment is on fire, let it burn, protect the exposures, and contact the utility company.

DON'T

- Park emergency vehicles under or near overhead lines.
- Touch downed lines, even with gloves, sticks, or tools.
- Assume the electric utility has already been notified when you encounter downed lines.
- Allow aerial device equipment such as ladder trucks to approach closer than 10 feet to an overhead utility line.
- Pull electric meters or cut service lines.
- Apply water or foam to burning electrical equipment.
- Enter electric utility substations without the OK from the electric company.
- Enter underground vaults or manholes until the "all clear" is given by the electric utility.

DEFINITIONS

AC Voltage: Alternating Current changes at a rate of 60 times a second, major source is generators.

Circuit: A conductor or system of conductors through which an electric current is intended to flow.

Communication Lines: The conductors and their supporting structures for telephone, telegraph, railroad signal, data, clock, fire, police alarm, community television antenna and other systems that are used for public or private signal or communication service.

Conductor: A material, usually in the form of a wire or cable suitable for carrying an electrical current.

Current: The flow of electricity through a conductor.

DC Voltage: Direct current steady consistent voltage, major source is batteries.

Direct Contact: When any part of the body touches or contacts an energized conductor or an energized piece of electrical equipment.

Ground (noun): A conductive connection by which an electric circuit or equipment is connected to ground.

Ground (verb): The connecting of an electric circuit or equipment to ground.

High Voltage: Greater than 600 volts.

Indirect Contact: When any part of the body touches any object that is in contact with an energized electric conductor or an energized piece of electrical equipment (EXAMPLES: Tree limbs, tools, equipment, trucks, etc.)

Insulated: Separated from other conducting surfaces by a dielectric substance offering a high resistance to the passage of current.

Low Voltage: 600 volts or less

Manhole: A subsurface enclosure which personnel may enter and is used for the purpose of installing, operating and maintaining submersible equipment and or cables.

Step & Touch Potential: The area around an energized conductor that is in contact with the ground and how far the voltage field extends from the contact point.

Resistance: The opposition to the flow of electricity measure in ohms.

Voltage: The speed that electricity flows through power lines.

REVIEW QUESTIONS

1. What is the minimum electrical voltage that can kill a human being?
2. Electricity will always take the shortest path to ground; if you get between the electrical source and the ground you would become a conductor and be _____.
3. What is the classification for a fire in energized electrical equipment?
4. What is the OSHA Standard that ground ladders and aerial ladders should be kept from high-voltage lines or equipment.
5. What is the only way to make sure that a wire is de-energized?

CHAPTER II

RECOGNIZING AND AVOIDING THE HAZARDS OF NATURAL GAS AND CARBON MONOXIDE

INTRODUCTION

First responder fatalities have involved natural gas and carbon monoxide. The purpose of this program is to:

- help you to understand the properties of natural gas and carbon monoxide,
- give you a basic knowledge of how the gas system works and what causes carbon monoxide,
- make you aware of the hazards of natural gas and carbon monoxide, and
- offer approaches for responding to natural gas and carbon monoxide emergencies.

This chapter will help you better understand and determine what precautions need to be taken when responding to natural gas and carbon monoxide incidents.

Natural gas cannot be seen and is odorless in its natural state. Natural gas and carbon monoxide can be dangerous and can injure and / or kill emergency workers. For specific facility and emergency response needs in your service area, meeting with your local gas company on a periodic basis is strongly recommended.

Firefighter Fact Natural gas has a flammable or explosive range from just below 5 percent in air to just below 15 percent in air. These percentages are known as the "LEL" (Lower Explosive Limit) and "UEL" (Upper Explosive Limit).

PROPERTIES AND CHARACTERISTICS OF NATURAL GAS

This section provides a general summary of the properties of natural gas. Key safety and tactical points are indicated.

Natural gas is a petroleum-based compound that was created just as the name implies, naturally. Like crude oil, natural gas formed underground from the breakdown and decay of organic matter (plant and animal material) over millions of years due to pressure and heat from the changes that have taken place during the evolution of our planet. Natural gas, a hydrocarbon, is primarily methane with small amounts of propane ethane, and butane. The small portion of ethane is considered the identifier for natural gas; it is not found in sewer gas or swamp gas. For this reason ethane detection equipment is utilized whenever an investigation needs to confirm the actual presence of natural gas. Natural gas is found underground, sometimes on top of reservoirs of oil or by itself in a pocket of gas. When natural gas burns, the products of combustion include carbon dioxide, water, and of course heat. When the combustion is incomplete, traces of CO (carbon monoxide) are produced. Carbon monoxide is an extremely dangerous gas and will be discussed at a later point.

See Table D-1 for selected flammable ranges and Figure D-6 for gas percentage vs. LEL percentage. In other words, if the concentration of the gas mixed with air reaches a level just below 5 percent, the gas can ignite. If the concentration increases to a point just above 15 percent gas in air, the gas will not ignite. While natural gas will ignite anywhere within this range, the ideal gas-

TABLE D-1		
Material	Lower Explosive Limit	Upper Explosive Limit
Acetylene	2.5	100
Carbon Monoxide	12.5	74
Ethyl Alcohol	3.3	19
Fuel Oil No. 1	0.7	5
Gasane	1.4	7.6
Hydrogen	4	75
Methane	5	15
Propane	2.1	9.5

Source: NFPA 325, Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids, 1994 edition.

COMPARISON OF GAS DETECTION READINGS % GAS VS. % LEL

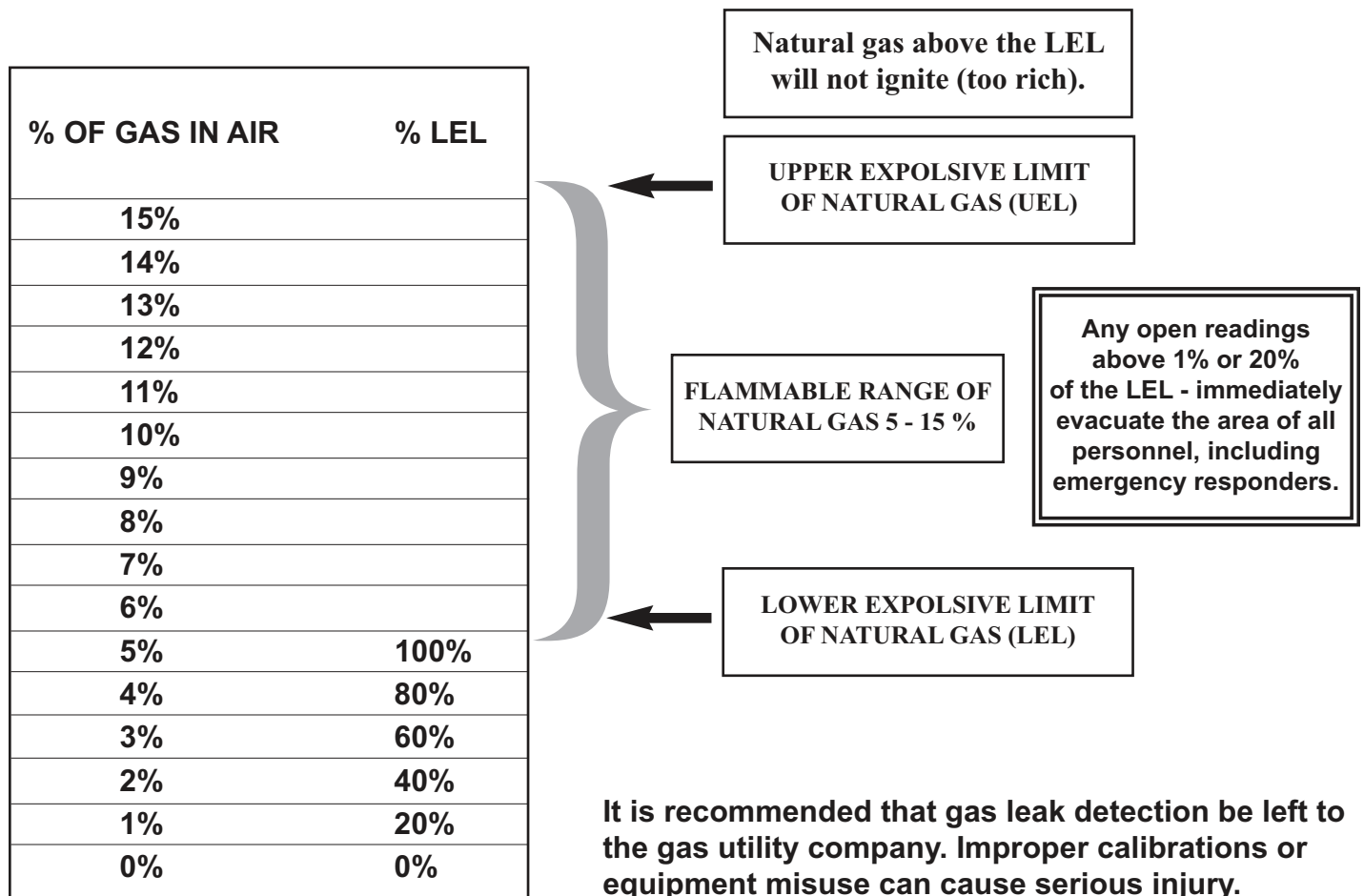


Figure D-6

air mixture for the burning of natural gas is approximately 10 percent. Keep in mind that if one encounters a natural gas concentration below the "LEL," whether outdoors or indoors, there may very well be a flammable concentration in an area nearby. Do not assume that an area is safe just because it appears safe where you are standing at any given moment.

Natural gas will ignite at a temperature of approximately 930 degrees Fahrenheit. Sources of ignition capable of generating 930 degrees are all around us. It is important that we look at some of the items and conditions that can cause an ignition, as we may never think of many of these potentially dangerous ignition sources. A lit cigarette is hot enough to ignite natural gas. Matches, lighters, and even the sparks generated by the starter or alternator of motor vehicles can ignite natural gas. It goes without saying that warning flares used for traffic control supply more than enough heat than is necessary to ignite natural gas. A vehicle driving through a natural gas concentration within the explosive range could in turn ignite the gas. Cell phones, pagers, and radios all have switches that, when activated, can generate sparks sufficient to ignite natural gas. In and around a structure the list of sources of ignition grows even longer. Doorbells, light switches, smoke alarms, telephones, pilots on appliances, and filaments in light bulbs (including flashlights) if the bulb or lens breaks can all generate an arc or heat source sufficient to ignite natural gas. Even static electricity arcs from your clothes, body, or other sources can create sparks of sufficient heat to ignite the gas.

Never take cell phones, pagers, radios, or two-way radios into the suspected leak area. Never ring a doorbell to contact occupants of a structure; knock on the door. Do not operate any appliances or turn anything off or on (including lightswitches) in a suspected gaseous atmosphere. The arc created when unplugging an appliance from a wall outlet is sufficient to ignite natural gas. First responders have a difficult and often hazardous job. Remember, controlling sources of ignition in a possibly explosive area can keep a dangerous situation from becoming a deadly one.

After processing, natural gas is odorless, colorless, and tasteless. However, if you walk into a room or area where there is a gas leak, you will usually smell the telltale "rotten egg" odor since natural gas has odor added to it. The first code in the United States for the odorization of

Caution Whenever possible one should approach a suspected natural gas leak from an upwind direction. All vehicles should be kept a safe distance from the suspected leak area.

natural gas was brought about by a 1937 incident in Texas. An undetected natural gas leak led to an explosion in a school causing tremendous loss of life. Today, all natural gas, as well as propane, is odorized using chemicals such as mercaptans or sulphides. These odorants are absorbed by the gas, have no effect on its properties for burning, and are harmlessly burned up with the gas. Odor is one of our warning signs for a gas leak. However, keep in mind that there are conditions that can counter the effectiveness of this warning sign. Certain conditions in the gas piping can actually remove the odor from the gas. In some cases, the chemicals and solvents used in the manufacture of plastic pipe, natural odors in farm or rural areas, and some manufacturing odors can mask the odor of natural gas.

In some cases your own olfactory abilities may be compromised by allergies, illness, or interference from other odors. It is usually necessary to use some type of gas detection equipment for the confirmation of natural gas in an area. It is recommended that the gas company evaluate the gas leak. Gas detection equipment requires training, calibration, and compliance with the manufacturer's procedures for use.

This and other issues regarding propane will be discussed later. Whether from an underground leak trying to make its way to the surface or a leak in a structure, natural gas will always try to travel up. Underground, the gas may be diverted by obstacles such as rocks, frost, paving, or other objects that can stop its upward travel. The more dense the soil and the more the gas is diverted, the larger the spread or migration of the gas.

These paths can often create highways into structures. Leaking natural gas inside a structure will again try to find a way to go up. For example, gas leaking from an appliance in a basement will work its way up stairways, holes through floors for electrical cables and water and sewer pipe, and even up the interiors of walls. Once on the next floor, the process continues to the next floor or attic, and the process continues.

Caution Never rely solely on your sense of smell to determine the hazard or lack of hazard in a gas leak area.

Firefighter Fact Keep in mind that natural gas is lighter than air. The specific gravity of natural gas is approximately (.6) while the specific gravity of air is (1.0). Propane with a specific gravity of (1.5), however, is heavier than air.

Firefighter Fact Natural gas can be diverted to the point that an underground leak can migrate into a structure from great distances. Natural gas can very easily follow sewer lines, underground electrical and phone conduits, and even the more loosely packed soil around underground pipes and cables.

Firefighter Fact Natural gas is not toxic. It can, however, displace oxygen; in high concentrations, it can displace enough oxygen to cause asphyxiation. Be especially aware in confined spaces and structures that, while natural gas will not poison you, it can still kill you by removing your life-supporting oxygen.

When checking for natural gas indoors, always check near ceilings and in openings through floors, under cabinets, and so on. Remember, always maintain control of potential ignition sources. Never use an elevator in a high-rise type structure where a natural gas leak is suspected.

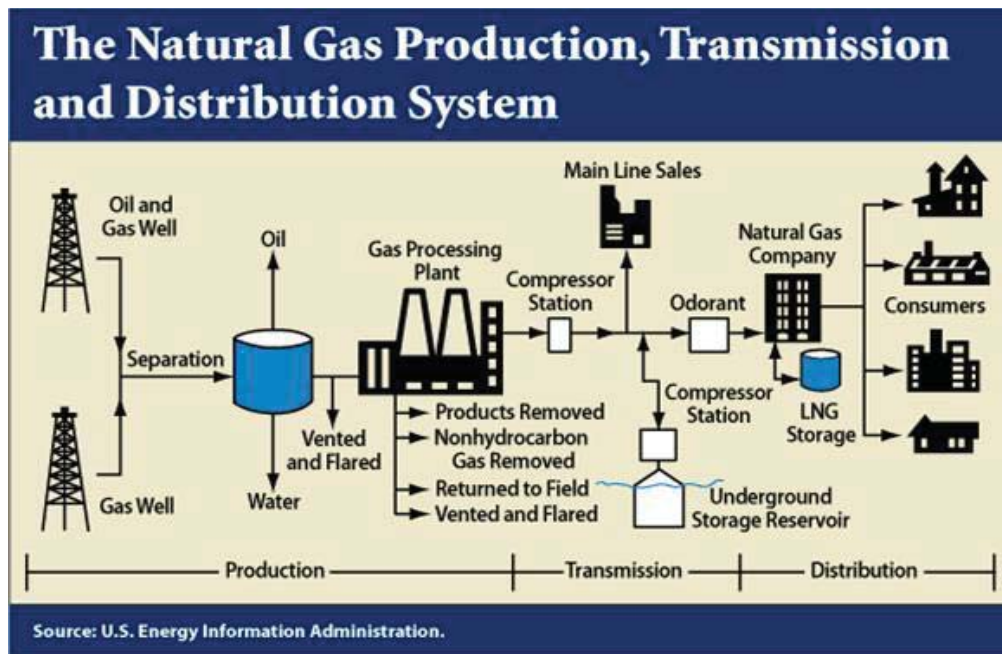
The gas most likely will collect in the top of the elevator shaft and ignite as soon as you press a button to call the elevator, as the motor and controls are usually in the top of elevators, and cars.

It is well-known that the more you know about a subject, the better you are able to handle and work with that subject matter. The preceding information is intended as a tool to assist you in dealing with emergency situations involving natural gas.

THE NATURAL GAS DELIVERY SYSTEM

This section provides an overview of the natural gas delivery system. Key safety and tactical points are identified. For specific facility and special emergency response needs in your service area, meeting with your local gas company on an annual basis is strongly recommended.

The gas delivery system is depicted in Figure 11-2. Natural gas is transported from the wellhead via a pipeline to a processing plant where it is cleaned by having water and other contaminants removed. From that point it begins its journey across the country in a complex system of high pressure, transcontinental pipelines. This steel pipeline can be as large as 4



Source: U.S. Energy Information Administration.

Figure D-7

in diameter and carry product at pressures as high as 1200 psi. Along the way the friction in the pipe causes the natural gas to slow down. To counter this, every 50 to 60 miles, the natural gas goes through a "compressor station" where the pressure is boosted and the gas is moved quickly along its way. These transmission lines follow "right-of-



Figure D-8 Underground Gas Pipeline Warning

ways" or property that is dedicated to the use of the pipeline. These "right-of-ways" are identified with markers to verify their location. While the style of the markers may vary, the information they impart is similar: "Warning: Underground Gas Pipeline." In most cases there will be "Emergency Contact" phone numbers included on pipeline markers, Figures D-8.

Following this stage of its journey the natural gas arrives at a location known as a gate station or border station. Two important things happen to the natural gas at these stations. The odorant is added and the pressure is reduced for delivery to the utility company's local distribution lines. All natural gas is odorized by the cross-country transmission companies before it enters New Jersey. The distribution lines, called mains, can range in size from 2 to 20 inches and sometimes larger. These mains carry the gas to business, residential, and industrial customers. In the early years of natural gas distribution, mains were actually made of wood (hollowed out tree trunks) and handled very low pressures. Over the years, this material was gradually replaced by cast iron, and then steel and plastic. Today the primary material for natural gas piping is wrapped or coated steel and plastic. Pressures in these mains can vary greatly depending on the application and demand in a given area. A utility company's "transmission mains" can be pressurized in excess of 1,000 psi while at the other end of the scale, "low pressure" (usually older cast iron) mains can be regulated at pressures as low as 1/4 psi. The vast majority of these "mains" are located underground. The exception to underground mains is the occasional bridge crossing. It is sometimes much more economical and practical to suspend a natural gas main from a bridge than to utilize directional drilling to cross under a waterway.

The pressures in these different "mains" or "distribution lines" are set and controlled by "regulator stations." The regulator station is a collection of valves and regulators that maintain correct pressures for a given section of distribution and also include safety devices to prevent over pressurization. These safety devices are known as "relief valves." Relief valves are mechanical devices that stay closed up to a preset pressure. If the preset pressure is exceeded, the "relief valve" begins to open and vent off the over pressurized natural gas. Once the pressure returns to the normal preset pressure the valve will close automatically, Figure D-9.

You may create an even larger problem on another part of the distribution system if you interfere with the operation of a relief valve. If a "relief valve" is venting or blowing, notify the utility company immediately.

The "regulator station" may be located above ground or below ground, in a pit or vault. These pits and vaults, commonly known as "confined spaces," present a whole new set of safety concerns and problems. Before entering a confined space one must perform many safety checks and procedures. It is strongly advised that when responding to a situation at a pit or vault that you only take actions to keep the area around the pit or vault as safe as possible, under your control with restricted access.

Safety

If a "relief valve" is venting or blowing, it is doing its job properly. Do not try to shut it off.



Figure D-9 Safety Valve

Safety

Notify the utility provider and wait for their response. Do not enter these areas; if a fire is active in the vault or pit, do not fill it with water to try to extinguish the flames..

Safety

By extinguishing a natural gas fire you may only be trading a known, visible hazard for an invisible cloud of natural gas that can create a potentially explosive situation in another area. Protect the exposures and let the gas burn. The best way to extinguish a natural gas fire is to shut off the source of natural gas.

Keep in mind, if a natural gas fire is not affecting life or property, it may be better to let it burn until the utility company can bring the situation under control.

The flow of natural gas throughout the utility company's "distribution mains" is controlled by valves and regulators. The final control before the customer's equipment is the customer regulator and shutoff valve. The customer regulator lowers the pressure to a level that is appropriate for the equipment used by the customer. Whether indoors or outdoors the shutoff valve is usually located just before the regulator or just before the gas meter. These valves are the only valves that you should operate. They are the primary valve for stopping gas flow to a structure. In most cases, the gas shutoff valve is a 1/4-turn valve. In other words, one quarter rotation is all that is necessary to close or open this type of valve. When the wing on the valve is aligned with or parallel to the gas pipe, the valve is open. When the valve wing is positioned across or perpendicular to the gas pipe, the valve is closed. The simplest tool for operating these valves is either an adjustable wrench or properly sized end wrench.

In some cases where the fire is confined to an individual appliance, it may be just as practical to



FigureD-10 Outside Gas Meters

only turn off that appliance's shutoff valve rather than shutting down an entire structure. Figure D-10 is an example of an outside utilization pressure gas service meters and valves.

Safety

If it is necessary to shut off meter valves for stopping gas flow to a fire, be sure to lock and tag the valve such that it can NOT be turned back on. Only the utility company should turn on a gas service valve after it has determined the safety of such an action.

service on the right hand side. As can be seen, the regulator and vent indicate a pressure gas service.

In some cases one may find a gate style valve in these locations. Gate valves require several full rotations to either open or close. It should be noted that while the function of these valves is the same as 1/4-turn valves, be sure you know the difference. If you only turn a gate valve 1/4 turn, the gas will continue to pass through the valve. Generally, gate valves are used on larger commercial and industrial gas services. A change in the meter index may provide a means of determining if a gate valve has been closed. If there is no gas flow and

no change can be determined by the meter index, you will not be able to determine the position of the gate valve. Gate valves are generally used for commercial and industrial customers and for larger-sized gas services.

While there are many valves used to control a natural gas distribution system the first responder should never attempt to turn, close, or open any underground valve. Whether service valves, street valves, main valves, or regulator station valves, you should never turn or attempt to close or adjust any valve other than a shutoff valve on an outdoor or indoor meter.



Caution

Without the knowledge of the function of a particular valve, operating any underground valve can create potentially severe hazards and potentially dangerous consequences in another section of the distribution system. Never turn (operate) underground natural gas valves.

FigureD-11

NATURAL GAS UTILITY OVERSIGHT

This section provides a reference of the regulations applicable to the natural gas distribution and transmission system in New Jersey.

The United States Department of Transportation and the New Jersey Board of Public Utilities regulate the natural gas industry and the gas delivery system. Title 14 of the New Jersey Administrative Code and Section 49 of the Code of Federal Regulations Part 192 are the applicable codes. Gas utilities are required to report certain gas incidents to the New Jersey Board of Public Utilities and/or the National Response Center. The National Transportation Safety Board and the New Jersey Board of Public Utilities investigates the most serious transportation incidents including natural gas and liquid pipeline incidents.

KEEPING THE GAS SYSTEM SAFE- DAMAGE PREVENTION AND RESPONSE

This section provides information on preventing damage to gas facilities.

Understand that one of the primary causes of gas incidents is excavating equipment damaging underground gas facilities. Preventing damage to utility facilities can prevent an emergency response. There are on average around 3,000 cases of gas facilities being damaged each year in New Jersey. Many states have enacted laws to protect underground facilities. In New Jersey the law is entitled the Underground Facility Protection Act. Excavators are required to notify the New Jersey One-Call Center at 1.800.272.1000 prior to excavating and obtain a mark-out request at no cost. The One-Call Center is toll-free and available 24-7. After a mark-out request has been obtained, underground facility owners and utilities are required to mark their facilities according to the law and in colors that identify the facility type. The color coded system that identifies the different types of buried utilities can aid you when you respond to a hazard call at or near a

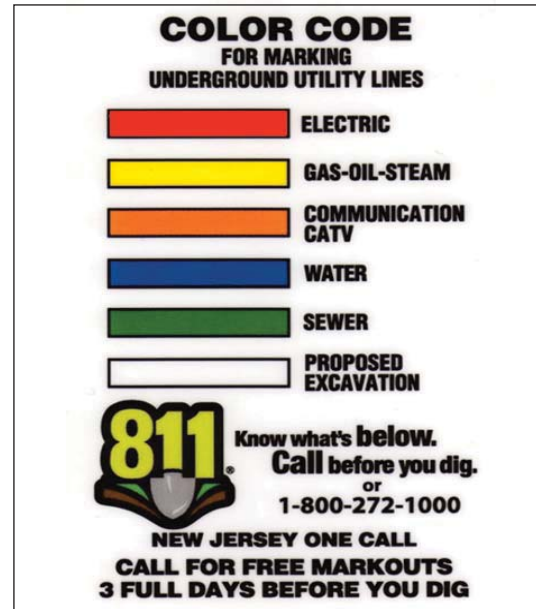


Figure D-12 Utility marking color code.

construction site. It is important for you to know what systems could be affected. For more detailed information or training call the New Jersey Board of Public Utilities at 973.648.2066.

Figure D-12 depicts the color code for facility markings. A yellow flag or paint tells you that there is a gas, oil, or steam line underground. Red flags or paint identify electric lines. Buried cable television, telephone, and fiber optic cables are marked by an orange flag or paint. When you see a blue flag or paint, there is a water main or service underneath. Green markings indicate a sewer line.

Prevention

The best approach to avoid a damaged facility incident is damage prevention. Calling New Jersey's One-Call Center at 1.800.272.1000 prior to excavating and/or ensuring excavators have markings are actions that can avoid an incident.

If you encounter an excavator who you believe does not have a mark-out request, notify the New Jersey Board of Public Utilities at 973.648.2066. Besides endangering the public, a willful violation of the Underground Facility Protection Act carries civil fines from \$1,000 to \$500,000 and criminal penalties. In addition, excavators can be liable for the incident damage and associated costs. Local utilities can also assist in determining if a mark-out has been requested.

CASE STUDY II-1 NTSB/PAB-04/01

Excavation Damage to Natural Gas Distribution Line Resulting in Explosion and Fire, Wilmington, Delaware, July 2, 2003,

Remember: A gas leak can occur away from the construction activity.

On July 2, 2003, a contractor hired by the city of Wilmington, Delaware, to replace sidewalk and curbing dug into an unmarked natural gas service line with a backhoe. The gas leak was not observed at the damage contact. Although the service line did not leak where it was struck, the contact resulted in a break in the line inside the basement of a building across the street, where gas began to accumulate. A

manager for the contractor said that HL: did not smell gas and therefore did not believe there was imminent danger and delayed calling the gas company. A subsequent explosion destroyed two residences and damaged two others to the extent that they had to be demolished. Other nearby residences sustained some damage, and the residents on the block were displaced from their homes for about a week. Three contractor employees sustained serious injuries. Eleven additional people sustained minor injuries.

Anytime you respond to a call where a gas odor is reported, and there is construction in the area, check the markers along the ground, because they might indicate that the source of the leak is construction related. Remember that the damage may have caused multiple leaks or damage to the gas facilities at the construction site and/or away from the construction site in locations like across the street or inside buildings. Besides the normal emergency response precautions and evacuation criteria, check nearby buildings and buildings across the street or surrounding the construction area. If you detect any odor of gas, evacuate as a precaution. Work with the local gas company to determine the full extent of the gas leak and safe area. The two case studies that follow provide examples of why a complete evaluation of the emergency situation is required to safeguard your life and public safety.

Damage to underground facilities is a top priority of the United States Department of Transportation's Office of Pipeline Safety due to a high number of significant incidents that have occurred. Annually, New Jersey experiences up to 5,000 incidents where underground facilities are damaged. Sixty percent involve natural gas facilities. Many involve multiple facilities being damaged, including water and gas. Damage to water facilities can affect fire hydrants in the area.

The two case studies investigated by the National Transportation Safety Board are typical incidents that have occurred in many states. Similar incidents have occurred in New Jersey. New Jersey,

besides being the most densely populated state, also has the highest underground facility density of any other state.

DETECTION METHODS FOR NATURAL GAS

This section provides approaches for detecting natural gas. As a general rule when a gas odor is detected in a building, evacuate the building and work with the gas company to evaluate the gas leak.

When checking for gas leaks, an invaluable apparatus is the Combustible Gas Indicator, mostly referred to as a "CGI." Many fire departments, and an increasing number of police and EMT units, have this equipment, which is used to capture samples of the air and display any concentrations of natural gas. The first step is taking a clean air sample to have a reference point for the CGI. This is called "zeroing out," and is done before samples are taken in the area of the suspected gas leak. While the CGI and other sampling equipment are critical for evaluating a gas leak, equally important is the proper use and calibration of such equipment.

Caution Improper use or the use of an out of calibration device can place you in serious risk or jeopardize your life.

CASE STUDY II-2 NTSB/PAB-00/01

Natural Gas Service Line and Rupture and Subsequent Explosion and Fire, Bridgeport, Alabama, January 22, 1999

Remember: Damage to the gas service can cause multiple gas leaks.

On January 22, 1999, while digging a trench behind a building at 406 Alabama Avenue, a backhoe operator damaged a 3/4-inch steel natural gas service line and a 1-inch water service line. This resulted in two leaks in the natural gas service line, which was operated at 35 psig. One leak occurred where the backhoe bucket had contacted and pulled the natural gas service line. The other was a physical separation of the gas service line at an underground joint near the meter, which was close to the building. Gas migrated into the building, where it ignited. An explosion followed, destroying three buildings. Other buildings within a two-block area of the

explosion sustained significant damage. Three fatalities, five serious injuries, and one minor injury resulted from this accident.



Most gas companies and providers have established evacuation protocols for gas leak investigation personnel. Generally any open-air CGI reading of 1 percent or 20 percent of the Lower Explosive Limit (LEL) in a structure means that all persons must be evacuated including those evaluating the gas leak. In addition, a gas mixture may be too rich to ignite (greater than the Upper Explosive Limit—UEL) in places and will be moving through the explosive range as the areas are vented.

Sampling needs to be done throughout the house, but before doing this, responders should be in full "PPE" personal protective equipment. You need to protect yourself against any possibility of an accidental ignition. When the utility company personnel arrive, additional sampling with a CGI may also take place, including outside areas. They have additional tools to take underground samples where gas may be migrating. However, if the smell of natural gas is strong throughout the outside area, checking for levels inside neighborhood houses would be a sound precaution. It is vitally important to know that this equipment is sophisticated and sensitive. In order to be confident that what you're reading is accurate, periodic calibration testing ensures reliability and, with many companies producing CGI equipment, each sets its own maintenance guidelines and training. Different brands may require different procedures for taking

gas samples. It is recommended that you rely on the local gas company for gas leak evaluation.

WHEN GAS ESCAPES THE SYSTEM

This section provides approaches for responding to natural gas emergencies.

Despite every effort to monitor and maintain the integrity of the natural gas system, its size and complexity, combined with the forces of nature, prevent it from being totally immune to uncontrolled gas leaks. Understand that whenever a natural gas emergency presents itself, it will be classified in one of four ways:

- Gas escaping outside
- Gas escaping inside
- Gas burning outside
- Gas burning inside

The majority of calls involving natural gas don't involve fires; typically, when someone such as a homeowner smells gas, that person will dial "911" to report the problem. The first responder might be the closest person to the scene. What's important is that all responders coordinate their activities and take every precaution to protect lives . . . including

your own. If some of the guidelines and ignition sources seem overly cautious, they're not. Expect the unexpected. Investigating gas leaks presents a number of hidden dangers.

Initial Response

Before you arrive on the scene and prior to starting a gas leak investigation there are actions to take:

- Contact the local gas company or gas provider and request assistance
- Position emergency vehicles to avoid potential gas leak sources such as:
 - Catch basins
 - Manholes
 - Storm drains
 - Areas too close to houses
- Position emergency vehicles away from any building with leaking gas in case the building were to explode and park the vehicles upwind of the gas leak (any breeze should be at your back, and blowing any gas away from your vehicle.)
- Eliminate sources of ignition before investigating a gas leak:
 - Shut off vehicles
 - No smoking
 - No flares
 - No portable radios
 - No cell phones, pagers, or other electronic equipment
 - No doorbells—knock instead
 - No operating light switches (leave as it was found)
 - No telephone calls to the residence
 - No static charge
- Turn on emergency equipment prior to investigating a gas leak
 - Combustible Gas Indicator or detection equipment
 - Flashlight

Secure the Site

Establish a site perimeter and reroute vehicle traffic as necessary. Eliminate sources of ignition. When the presence of gas is strong, the best rule is to evacuate people from the dwelling and move them across the street or a distance far away that would prevent injuries if the structure were to explode. Also be aware that shuffling your feet on many types of surfaces can cause a static electricity discharge. Remember you are evacuating and securing the area in case of an explosion. Check surrounding houses for gas odors. Keeping in mind the capability of natural gas to migrate, evacuate

Safety Any time you respond to a possible gas emergency, first responders shall verify the response of gas company personnel through your local fire dispatch center.

other residents who live in any adjoining properties at least one house away. If the presence of gas is detected in any of these structures continue checking until you get two "clean" houses or buildings from the last known detection, or when the end of a row of houses or buildings is reached. If you have either called for backup, or have been called, ensure all responders follow all the "make-safe" procedures just described.

As other responders and agencies arrive, it is important that everyone's activities are coordinated and contribute to preserving life. If assisting in evacuation or traffic control, remember not to ring doorbells or use radio communications, unless from a safe distance.

Many times utility companies have "hotlines" dedicated solely for emergency situations, and their role is to assist you in any way to make the situation safe. Whoever is responding, whether first or last those individuals have a duty to protect life and property.

Periodic meetings with your local gas providers to discuss emergency response, local gas facilities with special needs or response criteria, your expectations, and teamwork are the best methods to follow prior to an incident occurring. In addition, these meetings will aid in developing the most effective resolution when an incident occurs.

Leaking Gas

There are many different types of gas leaks. The most dangerous is a blow to the pipe, causing a puncture and rapid venting. Environmental conditions like freezing and thawing cause cracks in cast iron pipes, also resulting in the rapid escape of gas. However, the most prevalent kind are slow leaks brought on by corrosion, producing slow seepages, which are obviously much harder to detect. Underground leaks usually mean migrating gas. The odorant added to the gas can become less effective, making the gas difficult to detect due to the odorant being scrubbed in the soil. The gas travels laterally, through the ground, following the path of least resistance, because it wants to vent. It can enter into any number of

spaces and accumulate. These spaces include, sewer lines, storm drains, underground utility lines, construction trenches, or a building. It also seeps naturally through the ground over time, and once it permeates the surface, it will rise into the environment. Not until then will the telltale odor be detected. Of course, there are factors that can make detection difficult. Natural causes are wind, which can carry away the odor; rain, snow, or frost, which may keep it from coming up through the surface or man-made barriers like concrete and asphalt. Conversely, cracks in the streets are places where migrating gas can be detected as it rises into the air. Inside, the "lighter than air" property of gas causes it to rise and collect near ceilings. The risk is even greater in cold weather, since ventilation is restricted to prevent heat loss.

Secure the area and protect the surrounding structures. Leave all repairs to the gas company/provider.

When Gas Is Escaping Outside a Building

- If gas is escaping from the ground, excavation, or an open pipe outside a building, notify the gas utility immediately.
- Areas surrounding the location should be cleared, roped off, or barricaded to make the location safe.
- Extinguish all open flames. Prohibit smoking. Restrict the use of electronic devices (i.e., pagers, cellular telephones, cameras, and portable radios). If working in the vicinity of the gas leak check surrounding buildings, basements in particular, for any presence of gas odor. Restrict or reroute all traffic until personnel from the gas company are able to control the gas flow.
- If a fire or gas leak situation requires the gas to be shut off immediately and the Fire Department cannot wait any longer for gas company personnel to respond, shut the service valve supplying the hazard area.
- Emergency responders should never operate underground valves. Only gas company personnel should operate underground valves.

- For services feeding multiple dwellings, it is preferred that aboveground service valves are not operated without utility assistance.

Damage to Gas Facilities

- Remember that when responding to any damage to gas facilities, emergency personnel should make every effort to keep the area safe while waiting for gas company assistance. This includes checking the extent of the gas leak in the immediate area and monitoring buildings on both sides of the street, since multiple leaks could become active at the same time.
- Under no circumstances should the Fire Department attempt to make a repair of any damage to gas facilities. Only gas company personnel have the proper personal protective equipment and knowledge to safely control the gas flow.

When Gas Is Burning Out of Doors

- Personnel, other than those from the gas company, should make no attempt to extinguish a gas fire unless a life is in jeopardy.
- When gas is believed to be involved in a fire, don't assume the fire is consuming all of the gas. Always check nearby buildings and sewers to make sure gas is not migrating. Clear the danger area and rope or barricade it. Notify the gas company immediately. Never operate an underground gas valve. Operating the wrong valve could further endanger life or property. Leave the decision to operate valves to gas company personnel. They are properly trained in operating gas valves and handling gas emergency procedures. Remember that gas may also be leaking elsewhere, so check the surrounding structures.
- Spray any surrounding combustibles if there is a danger of ignition. If it is necessary to extinguish a fire because a life is in jeopardy, use dry chemical and water fogging equipment. Do not direct a solid water

stream onto burning gas at the source of ignition. Remember—burning gas will not explode.

- Shut off the gas source.

When Escaping Gas Is Found in Buildings

When escaping gas is found in buildings, shut off the meters and notify the gas company immediately. Ventilate the building by opening the doors and windows if the gas level is below the LEL. Remember that if the gas level is above the explosive limit, venting the building could result in an explosion. Evacuate and wait for the gas company in the safe zone. Do not turn electrical switches or appliances on or off. Rubber boots should be used when entering a building where a gas leak is suspected, as shoes with nails could create a spark. Walking across a carpet could result in the development of a static electric charge or spark. Turn on flashlights before entering the building. Clear the buildings of occupants if a strong odor is found.

When Escaping Gas Is Burning in Buildings

When escaping gas is burning in buildings, notify the gas company immediately. The official in charge should determine if the gas can be shut off at the service entrance inside the building, at the regulator (in pressure system), or at the meter, depending on the type of installation.

- If there is an above-ground service valve at one or more of these locations, the valve can be shut off with a wrench.
- Reliance on the gas company to help evaluate the proper action is the best procedure. If the supply cannot safely be shut off, keep the surrounding combustibles wet by spraying them until the gas company emergency crews can control the flowing gas.
- It is possible that turning off the gas in certain industrial or commercial areas might create further hazards or seriously interrupt important and costly industrial processes.
- Never turn on a valve that was previously shut off. *Leave this to the gas company.*

- If it appears that the inside gas piping or meter may be endangered from the fire, notify the gas company immediately. The gas company is best equipped to shut off the supply of gas. However, if safety requires immediate action, the official in charge may proceed with shutting off the gas supply at an inside shutoff valve, if it can be done without exposing the person to undue hazard.
- In rare cases, gas may be burning out of control at an appliance. In such cases, shut off the valve on the line to the appliance if it is accessible, or shut off at the gas meter. In an apartment house where there may be difficulty in selecting the proper meter there is usually a valve where the gas service enters the building (service entrance) that can be shut off. Again, notify the gas company immediately and explain to the service person upon arrival what you have done. Do not turn on the valve at the service entrance, the meter, or appliance once it has been shut off; leave this to the gas company.

General Consideration for Electric Power Disconnection (limit potential ignition source.)

- Do not disconnect the electric. Have the electric utility disconnect the electricity when needed.
- Building emergency back-up generators may operate if electric is disconnected.
- If a larger area of electric is to be disconnected, work with the electric utility to minimize the impact on critical customers, customers on life support, and water pumping stations.

DEALING WITH NATURAL GAS FIRES

This section provides approaches for responding to natural gas fires.

- Classes of fires

Burning natural gas is a Class B fire. However, it can cause other materials to burn around it such as wood, paper, and vegetation, which are all Class A fires; or energized electrical wires, creating a Class C fire. So, you may be facing a multiple class fire. For machinery or fires involving electrical components, the safest way to extinguish the fire is to de-energize the circuit, and eliminate the gas supply.

- Ways burning gas can be extinguished

Water is not an effective method for extinguishing a natural gas fire. Dry chemical extinguishers should be used with proper technique. Shutting off the gas supply and allowing residual gas in the pipe to burn out is often the best approach. Shut off the meter supply valve or service valve when accessible.

- Dangers of interactions with electrical systems

A gas-fed fire may cause the insulation on overhead wires to burn. This damage may cause the live wires to fall in some cases. Don't approach fallen electrical lines until the power company disconnects them. Gas piping may also share a common underground trench with electrical facilities. In some cases both may be damaged by the blaze.

COMPRESSED NATURAL GAS VEHICLE EMERGENCY RESPONSE

This section provides information for approaching natural gas vehicle emergencies.

- How to recognize a compressed natural gas vehicle

Vehicles that use natural gas as a supplementary fuel to gasoline will have a blue symbol attached to the rear of the vehicle. The gas is stored in a cylinder, usually in the trunk of a sedan or rear of a van. Figure 11-14 provides an example of the decal.

- Gas dissipates quickly

If the natural gas delivery system is damaged in a collision, leaking natural gas should dissipate quickly. Natural gas is lighter than air and will tend to rise up away from ground level. Note: Propane gas is heavier than air and may accumulate over the ground surface. Know which gas you are dealing with; the sticker on the vehicle's rear will indicate this. Figure 11-15 shows the shutoff valves by the natural gas fuel cylinders.

- How to find and operate a manual shutoff valve

Look for the shutoff valve below the driver's side door; if it is not there, check the passenger side. Use this valve to shut off the gas supply in the engine compartment. The shutoff valve under the driver's or passenger's door is depicted in Figure 11-16.



FigureD-13 a-f

DO

- Notify the gas company immediately—utilize the gas company expertise
- Treat all gas leaks as hazardous until determined otherwise by the gas company
- Only shutoff aboveground meter valves
- Evacuate structures
- Secure affected areas
- Use only properly calibrated detection equipment
- Use only intrinsically safe communications and other electrically operated equipment
- Turn off radios, two-way radios, pagers, and cell phones prior to entering structures

DO NOT

- Park over manhole covers or storm drains
- Park in front or downwind of emergency locations
- Operate any in-ground valves
- Operate doorbells, light switches, or other electrical devices
- Turn off venting relief valves
- Extinguish gas fires until fuel sources have been secured
- Turn on gas valves
- Shut off gas service to industrial facilities without knowing what effect it can have regarding additional damage

REMEMBER

Natural gas has a flammable or explosive range from just below 5 percent in air to just below 15 percent in air; these percentages are known as the "LEL" (Lower Explosive Limit) and "UEL" (Upper Explosive Limit)

CARBON MONOXIDE - CAUSE, EFFECT, AND RESPONSE

This section provides information and approaches for carbon monoxide emergency response. Carbon monoxide (CO) is a colorless, odorless, and tasteless gas that is potentially deadly. CO is also slightly lighter than air (specific gravity is 0.97) and is flammable at the limits of 12.5 to 74 percent gas-to-air mixture with an ignition temperature of 1128 degrees Fahrenheit. One of the primary causes of (CO) gas is the incomplete or improper burning some of carbon-based fuels/fossil fuels. Some types of carbon-based fuels include wood, tobacco, coal, kerosene, gasoline, and natural gas. The threat of CO poisoning is most insidious when the gas collects unnoticed from the normally safe sources that have gone bad. Appliances should be inspected and serviced regularly if a problem is suspected. CO detectors are now mandatory in New Jersey, and must be installed prior to real estate sales. They are highly recommended to provide additional safety for occupants within all types of structures. CO detectors must be installed per the manufacturer's instructions to avoid false alarms. Some improper locations are often too close to an appliance and a correct location in many cases is in the hallway near the bedrooms.

In excess of 8,000 annual CO calls are received by New Jersey utilities. It is important to understand the dangers and causes of CO.

Cause

Although all gas equipment has been tested under rigid ANSI Standards for safety and proper combustion, it is imperative to keep in mind that the years of operation takes its toll and tends to cause breakdown and malfunction. Other causes of malfunction result from renovations of structures or blockage in flues by outside forces. Besides gas appliances other sources of CO may be kerosene heaters, internal combustion engines, fireplaces, and even smoking. Many times CO is associated with a sharp pungent odor. This odor, however, is the result of aldehydes and alcohols that are also produced as a result of incomplete combustion. In addition, condensation found on the inside windows of a home could result from the humid condition, which arises from incomplete combustion. The risk of CO is greatest in cold weather, when homes are closed up, preventing

hazardous gases from being ventilated, especially in newer, more-insulated homes. According to the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) (Ventilation Standard 62-89), a concentration of no more than 9 parts per million (PPM) (0.0009%) of CO is permissible in residential living spaces. CO is measured in parts per million with respect to the atmosphere.

Effect

Carbon Monoxide (CO) Exposure Symptoms

- Headaches
- Shortness of breath
- Queasiness
- Flu-like achiness without fever
- Drowsiness
- Flushed face
- Chronic fatigue
- Confusion
- Dizziness
- Nausea
- Unconsciousness
- Burning eyes

Warning Signs That CO May Be Present

- Presence of aldehydes and alcohols, which produce an acrid odor similar to vehicle exhaust.
- Condensation on walls and windows.
- Dead houseplants
- Lethargic pets.
- Less/hot water produced by fuel-burning appliances.

The best way for an emergency responder to detect CO in the atmosphere is through the use of an approved portable CO detection instrument, calibrated according to manufacturer instructions. This instrument is effective for monitoring for personal safety, measuring atmospheric CO concentrations for further actions, and locating and mitigating major sources of CO.

Table D-2 shows typical symptoms based on concentration and time of exposure.

- Each year some 200 people die from accidental poisoning from CO and another 5,000 are treated for it in hospital emergency rooms. The real toll is surely higher, since many of the symptoms of CO exposure are mistaken for the flu or another illness. CO readily inhibits the blood's capacity to carry oxygen simply because the body welcomes the flow of CO into the bloodstream easier than oxygen. It

TABLE D-2

Carbon Monoxide (CO) Exposure Limits and Symptoms

CONCENTRATION IN
PARTS PER MILLIONS

(PPM)	SYMPTOMS
50	No adverse effects with 8 hours of exposure.
200	Mild headache after 2 to 3 hours of exposure.
400	Headache, nausea, and dizziness after 1 to 2 hours of exposure.
800	Headache, nausea, and dizziness after 45 minutes; collapse and unconsciousness after 2 hours of exposure.
1,000	Loss of consciousness after 1 hour of exposure.
1,600	Headache, nausea, and dizziness after 30 minutes of exposure.
3,200	Headache, nausea, and dizziness after 5 to 10 minutes of exposure; collapse and unconsciousness after 30 minutes of exposure.
6,400	Headache, nausea, and dizziness after 1 to 2 minutes of exposure; unconsciousness and danger of death after 10 to 15 minutes of exposure.
12,800	Immediate physiological effects, unconsciousness, and danger of death after 1 to 3 minutes of exposure.

combines with hemoglobin, the oxygen-carrying pigment in the red blood cells, to form carboxyhemoglobin (COHb). CO could kill in minutes or hours depending on the level of CO and the time of exposure. The victim inhaling the toxic concentration of the gas becomes helpless before realizing that danger exists.

After being exposed to 50 PPM, most people start feeling the effects, although even lower levels can harm people with a heart condition. Also, small children, pregnant women, and elderly people are affected more rapidly. Some of the symptoms are headaches, queasiness, flu-like aches without fever, drowsiness, flushed face, chronic fatigue, confusion, and dizziness. Very often pets evidence these symptoms more quickly than humans, especially birds. Since death could occur within 1 to 3 minutes in a concentration of 12,800 PPM it is extremely important to monitor the air space with a calibrated CO-detection instrument before entering a suspected CO residence.

Emergency Response

When responding to a CO call, the main thought is safety. You must maintain your safety if you're going to save lives. If any CO reading are found at any entrance or window of the property with the CO detector, a breathing apparatus (SCBA) needs to be put on before entering the premise. If you don't have CO-detection equipment that has been calibrated to the manufacturer's specifications, but suspect CO poisoning, check for condensation on the windows. Again, don't enter without breathing apparatus.

Safety If you can't make a determination and suspect CO, evacuate immediately.

Remember, when in doubt, get them out. When you have the proper equipment, the premises are aired out completely, or you have the utility company to assist, search for anyone who may be sick or

overcome by CO. CO is lighter than air, which means that it will rise slowly in the home. Once the victims have been removed from the residence, efforts should be made to find the source

of the CO. The local utility is equipped to find the source from appliances and is also knowledgeable of the other gases that give false CO readings.

False Carbon Monoxide Reads from Different Sources

- Nitrous oxide (bleaching of rayon in new carpeting)
- Nitrogen dioxide (used to bleach flour)
- Hydrogen (most abundant element known, oils; and automobile battery when charging)
- Chlorine (dyes, insecticides, bleach powders, cleaning solvents, plastics, fire extinguishants)
- Hydrogen cyanide (almonds, seeds in peaches, apricots, plums, insecticides, plastics, burnt silk or wool)
- Welding gases, ethylene, and acetylene (ethylene is used to ripen fruits)
- Hydrogen sulfide (decaying organic matter)
- Sulfur dioxide (used in preserving fruits, disinfectives, bleaching textile fibers, straw, wicker, gelatin, glue, and beet sugar)
- New computer circuit boards
- Aerosol disinfectant
- Rubbing alcohol

REVIEW QUESTIONS

1. What are the properties of natural gas and gas leaks that a first responder must consider when responding to a natural gas incident?
2. Describe the Do's and Do Not's of natural gas emergency response.
3. What are the properties of carbon monoxide ("CO") a first responder must consider when responding to a CO incident?
4. What are the symptoms of CO poisoning?
5. Describe the exposure limits and levels of CO.

CHAPTER III RECOGNIZING AND AVOIDING THE HAZARDS OF PROPANE

INTRODUCTION

Fatalities to first responders have involved propane. The purpose of this program is to:

- help you to understand the properties of propane;
- give you a basic knowledge of how the propane system works;
- make you aware of the hazards of propane; and
- offer approaches for responding to propane emergencies.

This chapter will help you better understand and determine what precautions need to be taken when responding to propane incidents. Propane can be dangerous and can injure and/or kill emergency workers. For specific facility and special emergency response needs in your service area, meeting with your local propane provider or the propane association on a periodic basis is strongly recommended.

PROPERTIES AND CHARACTERISTICS OF PROPANE

This section provides a general summary of the properties of propane. Key safety and tactical points are indicated.

Propane is a liquefied petroleum gas found trapped in pockets with either crude oil or natural gas. About 30 percent produced today is refined from crude oil, with the other 70 percent processed from natural gas. Propane is odorless, tasteless, and colorless in its natural state; an odorant (ethylmercaptan) is added, similar to natural gas, so that leaks may be detected.

Propane belongs to a family of chemical

compounds known as hydrocarbons. This means they are made up of hydrogen and carbon atoms only. Natural gas (methane) has one carbon atom and four hydrogen atoms; propane has three carbon atoms with eight hydrogen atoms. This chemical composition makes propane similar to natural gas in many characteristics.

At a temperature colder than -44°F and open to the atmosphere, propane will reside in its liquid state. It would appear to be water. Propane due to its chemical characteristics is portable energy as we can store it as a liquid in a container under moderate pressure and then use it as a gas when withdrawn from the container. Each unit of liquid propane in a container produces 270 units of propane vapor.

The ignition temperature of propane in air is 920°F. The heating value of propane is about 2,500 Btu/cf, with its flammability range in air 2.15 to 9.60 percent. As natural gas, propane is non-toxic. However, it presents a possible inhalation hazard if released in a confined space, as it displaces oxygen and acts as a simple asphyxiate. Liquid propane is an effective refrigerant. It rapidly absorbs heat from the skin and can cause severe burns to the body.

Firefighter Fact Propane in its liquid state is about half the weight of water, while in its vapor state it is heavier than air and natural gas. Thus, when present, propane tends to go down and lay in low areas, while natural gas, being lighter than air, tends to travel upward.

Natural Gas	SG = .6
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Air	SG = 1.0
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Propane	SG = 1.5
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PROPANE DELIVERY SYSTEM

This section provides an overview of the propane delivery system. Key safety and tactical points are identified. For specific facility and special emergency response needs in your service area, meeting with your local propane provider or the propane association on a periodic basis is strongly recommended.

Propane is shipped from the refinery or natural gas processing plant to a local terminal and from there to the end user. Shipment to the local terminal can be via truck, railcar, or pipeline. All propane is shipped under pressure in its liquid state. From the local terminal ("bulk plant") to the residence or commercial property, delivery is effected by a bulk delivery truck, called a "bobtail." This truck would hold about 2,000 to 3,500 gallons of propane.

The "bobtail" truck transfers propane via truck hose to the consumer's storage container. This container could either be a United States Department of Transportation ("DOT") cylinder, or an ASME storage tank. The design pressure of the American Society of Mechanical Engineers ("ASME") storage tank is 250 psig, while that of the DOT house cylinder would normally be 240 psig. Either type of container would have a filler valve, pressure relief valve, service valve, and liquid level gauge located within the cylinder neck-ring or the tank dome. Some of the individual process features can be combined in one valve on the container. All process connections are protected either by an excess flow valve or a check valve in the event of a downstream piping breakage. The DOT cylinders would normally be placed adjacent to the residence or commercial building with a pressure regulator installed within the cylinder neck-ring (collar) along with the cylinder valve. The cylinder propane capacities would normally be 47 gallons (200 lbs) or 100 gallons (420 lbs). Two or more cylinders could be manifolded together. Entry to the building would be via aboveground copper tubing or steel piping from the cylinder with a shutoff valve in the gas service line. A gas meter or second stage regulator would be optional.

The ASME storage tanks could be installed aboveground or underground. The tanks would normally be a 500 gallon or 1,000 gallon (w.c) size. Propane is filled in a container to about 85 percent of its water capacity (i.e., a 1,000 gallon water capacity storage tank would be filled to a maximum

propane volume of 850 gallons). The ASME container would be installed 10' or further away from the building, with basically the same piping characteristics as the DOT cylinder installation, except that the piping run to the building from the ASME tank would normally be underground. It is important to note that all propane containers are never completely filled. The approximate 15 percent of the gross capacity (w.c.) of the container is used as a space for propane vapor. This allows for expansion of the propane liquid within the container. The propane pressure within the container is dependent on the outside ambient temperature. At 20°F the propane container pressure would be 40 psig; at 100°F, the pressure would be 172 psig.

Large multiple stationary ASME propane storage tanks ranging in size from 30,000 to 60,000 gallons (w.c.) are employed at various industrial plants and gas utility plants where propane is employed as a supplemental fuel to natural gas.

KEEPING THE SYSTEM SAFE

This section provides a reference of the regulations applicable to the propane distribution system in New Jersey.

Responsibility for system maintenance would be that of the user and the propane supplier. The governing regulation in New Jersey, established by the Liquefied Petroleum Gas Act (N.J.S.A. 21:1B-1 et seq.), for propane systems is N.J.A.C. 5:18 administered by the New Jersey Department of Community Affairs ("NJDEA"). The State has adopted NFPA pamphlet #58, the LP-Gas Code, as part of the state regulation. The propane supplier at the time of residential/commercial delivery is to inspect the container and outside system for acceptability and continued usage, Figure 111-1.

GENERAL EMERGENCY RESPONSE PROCEDURES

This section provides approaches for responding to propane incidents.

Upon arrival at the scene, a security perimeter should be established. Special care should be used to position emergency vehicles so that equipment is parked well outside the area of greatest risk. Control all ignition sources immediately. If



Figures D-4, a-e Various propane facilities

possible, rescue should be performed from an upstream location.

Large releases of propane may travel great distances, find ignition sources, and flash back to the source of the leak. During approach to the incident scene, avoid committing or positioning personnel and vehicles in a hazardous position or situation. Remember – unignited propane is heavier than air.

For escaping gas, hose streams with fog nozzles are to be used to disperse the propane gas away from any possible sources of ignition. Approach the leak from upwind and keep out of any cloud. A

combustible gas detector should be used to determine if hoselines are effective in dispersing the propane gas. When the gas indicator is considered within a safe range (below 10 percent of the Lower Flammable Limit LFL) rescue and repairs to shut off the flow of gas can be made by the fire service and the propane gas supplier.

For burning gas, approach the fire from upwind, making sure to stay out of the range of any possible flashback. The top of the container (vapor space) supplying the fuel should first be cooled with hose streams (water should also be applied to

the balance of the container). Cooling the container will cause the pressure to be reduced, thus closing any relieving container relief valve that might be feeding the fire. Do not extinguish the fire until the propane fuel supply can be shut off. If a container service valve is controlling the fuel feeding the fire, the surrounding atmosphere should be cooled with converging fog streams while the fire service attempts to close the valve. Continue to cool the container well after the fire has been extinguished. The area around the container should be monitored for flammable gas using a combustible gas indicator.

If the source of the fuel cannot be shut off, let the fire burn. Continue to cool the propane containers and adjacent exposures, Figure 111-2.

A propane tank contains liquid and vapor. Any external fire creating direct flame impingement on the vapor space will heat the tank's shell. If a vessel gets intense, concentrated heat on the shell area on top (vapor space) of the vessel, the metal will get hot and start losing its tensile strength. The vessel will start to swell in the hot area. This is an indication that the high pressure will soon blow out as the hot steel is being drawn thinner. When the blister rips, the whole tank contents will erupt upwards, causing a brief tower of fire. BLEVE is an acronym for Boiling Liquid Expanding Vapor

Caution Any decision to approach a propane tank showing direct flame impingement on its vapor space must be made on a case-by-case basis after evaluating the hazards and risks and determining if an adequate supply of water is available to support firefighting operations. Bulk storage tanks can fail within 10 to 20 minutes of direct flame impingement if the containers are not adequately cooled, Figure 111-3.

Explosion. A BLEVE is defined as a container failure with a release of energy, often rapidly and violently, which is accompanied by a release of gas to the atmosphere and propulsion of the container or container pieces into adjacent areas due to an overpressure rupture.

PROPANE CARGO TRUCK EMERGENCY RESPONSE

This section provides approaches for responding to propane cargo truck incidents.

For example, a propane truck is involved in a traffic accident and a gas cloud is escaping from the vehicle. After securing the site, the objective for this operation is to control or stop the propane from escaping the truck. Firefighters in full protective clothing should deploy hoselines to disperse and dilute the flammable gas while an approach is made to ascertain exactly where the leak is. A combustible gas detector should be used to determine the effectiveness of the hoselines in dispersing the gas. If there is severe damage to the truck's piping, the truck may have to be unloaded. Considerable time may pass until a compatible vehicle is available on scene for product transfer. Some attempt to stop the leak via a fiberglass wrap or a freeze wrap may be attempted by the fire service employing a water fog envelope. As there is no fire situation, if the ambient temperature is about 90°F, hose water fog played on the top of the tank can be effective in keeping the tank's shell cool. If the ambient temperature is below 40°F, hose water application should not be applied as it would only raise the temperature of the propane inside the vessel and thereby increase the tank pressure and the leak. Water should be available in case of fire development and the need to cool the vessel shell.

PROPANE VEHICLE EMERGENCY RESPONSE

This section provides approaches for responding to propane vehicle incidents.

Propane motor fuel tanks may be installed in cars, vans, pick-up trucks, and buses. Propane motor fuel tanks are manufactured in a variety of sizes and shapes to accommodate different vehicle designs. Fuel tank capacities normally range from 20 to 65 gallons. For automobiles the tank is mounted in the trunk. The motor fuel tanks are DOT cylinders with a design pressure of 312 psig. The container relief valve is vented to the outside with the relief valve discharge directed up or down within 45 degrees of vertical. An automatic fuel shutoff valve located as close as possible to the carburetor is provided to close propane flow when the engine is not running, though the ignition switch may be in the on position. Each vehicle powered by propane is identified with a diamond-shaped label located on the lower right rear of the vehicle (the word propane is centered in the diamond in silver or white reflective material on a black background).

In the event of a vehicle accident and fire, the responders should cool the propane motor fuel tank on the vehicle. If there is a propane fire in the engine compartment, this can be controlled by shutting off the engine, which should automatically close the propane fuel supply valve. Rescue of people from the burning vehicle must be evaluated/rendered while the fire is attacked and extinguished. While the propane storage tank is continuously being cooled, the responders should locate the fuel supply valve on the storage tank and close it. Continue to cool the cylinder until well after the fire has been extinguished. The cylinder metal surface should be cool enough to touch.

The area around the container should be monitored for flammable vapors using a combustible gas indicator.

BARBECUE GRILL FIRE/LEAK RESPONSE

This section provides approaches for responding to propane grill incidents.

Most barbecue gas grills are fitted with a 20-lb DOT propane cylinder. In the event of leaking propane gas, hose streams with fog nozzles are to be used to disperse the gas away from any possible sources of ignition. Approach the leak from upwind and keep out of any vapor cloud. A combustible gas detector should be used to determine the effectiveness in dispersing propane gas with the hose streams. When the gas indicator is considered within a safe range (below 10 percent of the LEL) the fire service should attempt to close the propane cylinder valve (note that this cylinder valve is right-to-tight), thus shutting off the flow of gas.

In the event of fire, the first objective is to cool the outside of the cylinder so that the cylinder pressure is reduced and the cylinder relief valve resets. Adjacent exposures should also be protected. The responders should then approach, from opposite the relief valve discharge, the cylinder under the protection of hand lines so as to manually close the cylinder valve (note that this cylinder valve is right-to-tight). Continue to cool the cylinder until well after the fire has been extinguished. The cylinder metal surface should be cool enough to touch. The area around the grill should be monitored for flammable vapors using a combustible gas indicator.

REVIEW QUESTIONS

1. What are the properties of propane and propane leaks that a first responder must consider when responding to a propane incident?
2. Describe your response to a propane fire?
3. What is a BLEVE?

APPENDIX

I

NEW JERSEY PUBLIC EMPLOYEES OCCUPATIONAL SAFETY AND HEALTH ACT

NEW JERSEY COMMUNITY AFFAIRS DIVISION OF FIRE

N.J.S.A. 34:6A-25. Short title

This act shall be known and may be cited as the “New Jersey Public Employees' Occupational Safety and Health Act.”

N.J.S.A. 34:6A-26. Legislative findings

The Legislature finds that the safety and health of public employees in the workplace is of primary public concern. Personal injuries and illnesses arising out of work situations result not only in wage loss and increased medical expenses for employees, but also in decreased productivity and increased workers' compensation expenses for employers. The Legislature therefore declares: a. that it is the policy of this State to ensure that all public employees be provided with safe and healthful work environments free from recognized hazards, b. that it is the responsibility of the State to promulgate standards for the protection of the health and safety of its public workforce, and c. that it is in the public interest for public employers and public employees to join in a cooperative effort to enforce these standards.

N.J.S.A. 34:6A-27. Definition

As used in this act:

a. “Advisory board” means the Public Employees' Occupational Safety and Health Advisory Board created by section 4 of this act;

b. “Commissioner” means the Commissioner of Labor or his designee;

c. “Employer” means public employer and shall include any person acting directly on behalf of, or with the knowledge and ratification of: (1) the State, or any department, division, bureau, board, council, agency or authority of the State, except any bi-state agency; or (2) any county, municipality, or any department, division, bureau, board, council, agency or authority of any county or municipality, or of any school district or special purpose district created pursuant to law;

d. “Employee” means any public employee, any person holding a position by appointment or employment in the service of an “employer” as that term is used in this act and shall include any individual whose work has ceased as a consequence of, or in connection with, any administrative or judicial action instituted under this act; provided, however, that elected officials, members of boards and commissions, and managerial executives as defined in the “New Jersey Employer-Employee Relations Act,” P.L.1941, c. 100 (C. 34:13A-1 et seq.) shall be excluded from the

coverage of this act;

e. “Employee representative” means a “representative” as that term is defined in the “New Jersey Employer-Employee Relations Act,” P.L.1941, c. 100 (C. 34:13A-1 et seq.);

f. “Review commission” means the Occupational Safety and Health Review Commission created by section 18 of this act;

g. “Secretary” means the Secretary of the United States Department of Labor;

h. “Workplace” means a place where public employees are assigned to work.

N.J.S.A. 34:6A-28. Public employees occupational safety and health advisory board

There is created a Public Employees' Occupational Safety and Health Advisory Board to assist the commissioner in establishing standards for the occupational safety and health of public employees. The board shall make itself available to receive information regarding matters of concern to public employees in the areas of occupational safety and health. The advisory board, under the chairmanship of the commissioner, shall consist of the Commissioner of Education, the Commissioner of Health, the Commissioner of Environmental Protection, the Commissioner of Community Affairs, the State Treasurer, or their designees, and 18 members to be appointed by the Governor, as follows: one member representing the fire service, one member representing municipalities, one member representing municipal employees, one member representing county government, one member representing employees of county government, one member representing State employees, one member representing public health care facilities, one member representing employees of public health care facilities, one member representing correctional institutions, one member representing employees of correctional institutions, one member representing law enforcement employees, one member representing local school boards, one member representing local school board employees, one member representing Rutgers, The State University, one member representing employees in institutions of higher education, and three members representing the public. The members selected by the Governor shall be selected on the basis of their experience and competence in the field of occupational safety and health. No more than nine members appointed by the Governor shall be from the same political party. Each member shall serve for a term of three years and until his successor is appointed and qualified. A vacancy shall be filled by appointment by the Governor to the unexpired term. The members of the advisory board shall serve without compensation but shall be entitled to reimbursement for their actual traveling expenses and other expenses incurred in the performance of their duties.

N.J.S.A. 34:6A-29. Plan for development and enforcement of standards; department of labor to be responsible for administration and enforcement

The commissioner shall, in consultation with the Commissioner of Health, the Commissioner of Community Affairs and the advisory board, promulgate a plan for the development and enforcement of occupational safety and health standards with respect to public employers and public employees, in accordance with section 18(c) of the “Occupational Safety and Health Act of 1970,” Pub.L.91-596 (29 U.S.C. § 651 et seq.). The Department of Labor shall be the sole agency responsible for administering and enforcing this plan throughout the State. The plan shall:

a. Provide for the development and enforcement of safety and health standards;

b. Provide for the right of entry and inspection in all workplaces by the commissioner;

- c. Provide for the right of entry and inspection in all workplaces by the Commissioner of Health;
- d. Prohibit advance notice of inspections;
- e. Contain satisfactory assurances that the Department of Labor and the Department of Health have the legal authority and qualified personnel necessary to carry out their responsibilities under this act;
- f. Give satisfactory assurances that the State will devote adequate funds to the administration and enforcement of the standards;
- g. Contain satisfactory assurances that the State will, to the extent permitted by law, establish and maintain an effective and comprehensive occupational safety and health program applicable to all employees of public agencies of the State and its political subdivisions, which program is as effective as the corresponding provisions of the "Occupational Safety and Health Act of 1970," Pub.L.91-596 (29 U.S.C. § 651 et seq.);
- h. Provide that the Department of Labor shall make such reports to the secretary in the form and containing the information that the secretary from time to time requires; and
- i. Provide for such cooperation with the Department of Community Affairs in implementing the plan as is consistent with the provisions of P.L.1983, c. 516 (C. 34:6A-25 et seq.) and the "Occupational Safety and Health Act of 1970," Pub.L.91-596 (29 U.S.C. § 651 et seq.).

N.J.S.A. 34:6A-30. Adoption of standards in compliance with applicable federal laws, more stringent than federal standards or state standards

- a. The commissioner shall provide for the adoption of all applicable occupational health and safety standards, amendments or changes adopted or recognized by the secretary under the authority of the "Occupational Safety and Health Act of 1970." Whenever the United States Secretary of Labor adopts a standard pursuant to the provisions of the "Occupational Safety and Health Act of 1970" (29 U.S.C. § 651 et seq.), the commissioner shall publish that federal standard in the New Jersey Register in accordance with the provisions of section 5 of P.L.1968, c. 410 (C. 52:14B-5) and, notwithstanding the provisions of section 4 of P.L.1968, c. 410 (C. 52:14B-4), that federal standard shall be deemed to be duly adopted as a State regulation upon its publication by the commissioner.
- b. The commissioner shall not adopt any standard within the scope of the State uniform construction code adopted pursuant to P.L.1975, c. 217 (C. 52:27D-119 et seq.) or the uniform fire safety code adopted pursuant to P.L.1983, c. 383 (C. 52:27D-192 et al.), unless the standard is a standard adopted pursuant to subsection a. of this section. If the Commissioner of Community Affairs determines that a standard for building or structural safety adopted by the commissioner pursuant to subsection a. of this section is more stringent than the applicable standards adopted into code pursuant to the State uniform construction code or the uniform fire safety code, he shall adopt a rule incorporating the more stringent standard into the relevant code. If the Commissioner of Community Affairs determines that there is a difference between a provision of any new or existing standard adopted pursuant to subsection a. of this section and a provision of the uniform construction code or the uniform fire safety code, and he determines that the provision of the code

is as effective as the provision of the standard, he shall prepare and submit to the commissioner an application for submission to the Secretary of Labor seeking (1) the approval of that provision of the uniform construction code or the uniform fire safety code as being as effective as the provision of the standard and (2) the approval of the incorporation of the code provision into the State plan.

c. Where no federal standards are applicable or where standards more stringent than the federal standards are deemed advisable, the commissioner shall, in consultation with the Commissioner of Health and the Commissioner of Community Affairs and, with the advice of the advisory board, provide for the development of State standards as may be necessary in special circumstances.

d. The commissioner and the Commissioner of Health, or their designees, shall meet with the advisory board at each scheduled meeting for these purposes. The advisory board shall meet not less than four times each year.

e. The Commissioner of Health shall not adopt standards or issue orders to comply in any area but shall be charged with inspection, investigation and related activities in the following areas:

- (1) Occupational health and environmental control;
- (2) Medical and first aid;
- (3) Toxic and hazardous substances;
- (4) Respiratory protective equipment; and
- (5) Sanitation.

The Commissioner of Labor shall be charged with inspection, investigation and related activities for all other regulated areas and with adopting of standards and issuing orders to comply in all regulated areas.

N.J.S.A. 34:6A-31. Commissioner to provide methods to encourage reduction of safety and health hazards and to educate employers and employees

The commissioner, in consultation with the Commissioner of Health and the Commissioner of Community Affairs and with the advice of the advisory board, shall:

a. Provide for a method of encouraging employers and employees in their efforts to reduce the number of safety and health hazards arising from undesirable, inappropriate, or unnecessarily hazardous or unhealthful working conditions at the workplace and of stimulating employers and employees to institute new, and to perfect existing, programs for providing safe and healthful working conditions;

b. Provide for the publication and dissemination to employers, employees, and labor organizations, and the posting, where appropriate, by employers of informational, educational and training materials calculated to aid and assist in achieving the objectives of this act;

c. Provide for the establishment of new, and for the perfection and expansion of existing, programs for occupational safety and health education for employers and employees and institute methods and procedures for the establishment of a program for voluntary compliance by employers and employees with the standards established pursuant to this act.

N.J.S.A. 34:6A-32. Regulations for enforcement and administration of act; grant of variance;

application of rules and regulations to leases

The commissioner shall, in consultation with the Commissioner of Health and Senior Services and the Commissioner of Community Affairs and with the advice of the advisory board, promulgate all regulations which he deems necessary for the proper administration and enforcement of this act. A variance may be granted if the commissioner determines that the applicant is in compliance with the requirements for a permanent variance as set forth in subsection c. of section 15 of this act. [FN1] The variance shall not be deemed to be a variation approved pursuant to the "State Uniform Construction Code Act," P.L.1975, c. 217 (C.52:27D-119 et seq.) or the "Uniform Fire Safety Act," P.L.1983, c. 383 (C.52:27D-192 et al.) or any other building or fire safety standard or code.

Space leased by a public employer shall be subject to current health or safety rules and regulations. Any deficiency, including a deficiency resulting either from occupant use or deferred maintenance by the lessor, shall be subject to correction in accordance with the governing rules and regulations at the time that the deficiency is cited by the commissioner or the Commissioner of Health and Senior Services . However, a lease of any duration may not be entered into unless the leased property is in conformance with such rules and regulations as are in effect at the time the lease is executed.

No fire company, first aid or rescue squad, whether paid, part-paid, or volunteer, shall be required to pay to the Department of Labor or the Department of Health and Senior Services any registration or inspection fee imposed by rule or regulation with regard to the filling of air cylinders for respiratory equipment used by the fire company, first aid or rescue squad.

N.J.S.A. 34:6A-33. Duties of employer

Every employer shall:

- a. Provide each of his employees with employment and a place of employment which are free from recognized hazards which may cause serious injury, physical harm or death to his employees; and
- b. Comply with occupational safety and health standards promulgated under this act.

N.J.S.A. 34:6A-34. Duty of compliance by public employees

Every public employee shall comply with occupational safety and health standards and all regulations promulgated under this act which are applicable to his own actions and conduct.

N.J.S.A. 34:6A-35. Inspections by commissioners; right of entry; records; availability to public; issuance of orders to comply; notice of violations

- a. The commissioner and the Commissioner of Health shall be charged with making inspections in their jurisdictional areas as specified in section 6 of P.L.1983, c. 516 (C. 34:6A-30). The commissioner may call on the professional staff of other departments whenever he deems their assistance necessary.
- b. Each commissioner shall have the right of immediate entry at reasonable hours and without advance notice into any workplace to conduct such investigations as he may deem necessary. Each commissioner shall maintain records of the results of any investigation under his jurisdiction, which, after a final agency or judicial action is taken regarding any order to comply which results from the inspection, shall be made

available to the public upon request, except that any information which identifies an individual employee shall be confidential. The authority of each commissioner to inspect any premises for purposes of investigating an alleged violation under his jurisdiction shall not be limited to the alleged violation but shall extend to any other area of the premises in which he has reason to believe that a violation of any provision of this act under his jurisdiction exists. The Commissioner of Health shall make his inspection records available to the commissioner for purposes of enforcement.

c. If either commissioner concludes that conditions or practices in violation of any provision of this act under his jurisdiction exist in any workplace, he shall inform the affected employees and employers of the danger.

d. Each order to comply issued under this section, or a copy or copies thereof, shall be prominently posted at or near each place where a violation referred to in the order to comply occurred and the commissioner shall make the order available to employee representatives, affected employees and, upon request, to the public.

e. Any employee who accompanies either commissioner on an inspection shall receive payment of normal wages for the time spent during the inspection.

f. Where there is no authorized employee representative, each commissioner or his authorized representative shall consult with a reasonable number of employees concerning matters of health and safety in the workplace.

g. Any person who gives advance notice of any inspection to be conducted under this act, without authority from the commissioner, the Commissioner of Health or their designees, shall, upon conviction, be punished by a fine of not more than \$1,000 or by imprisonment for not more than six months, or by both.

N.J.S.A. 34:6A-36. Inspection by commissioner by notice of violation or existence of imminent danger and request; procedure

a. Any employee, group of employees or employee representative who believes that a violation of a safety standard exists, or that an imminent danger exists, may request an inspection by giving notice to the commissioner of the violation or danger. The notice and request shall be in writing, shall set forth the grounds for the notice and shall be signed by the employee, a group of employees or an employee representative. Upon the request of the person giving the notice, his name or the name of any employee representative giving the notice shall be withheld. The commissioner shall conduct an appropriate inspection at the earliest time possible.

The commissioner shall so interpret and administer this section so as to encourage any employee, group of employees or employee representative who believes that a violation of a safety standard exists, or that an imminent danger exists, to report that violation or danger in the first instance to the employer's safety officer.

b. A representative of the employer, the employee or employees giving the notice and an employee representative shall be given the opportunity to accompany the commissioner during an inspection for the purpose of aiding in such inspection. Where there is no authorized employee representative, the commissioner shall consult with a reasonable number of employees concerning matters of safety in the workplace.

c. Any employee who accompanies the commissioner on an inspection shall receive payment of normal wages for the time spent during the inspection.

d. The information obtained by the commissioner under this section shall be obtained with a minimum burden upon the employer.

N.J.S.A. 34:6A-38. Grounds for inspection by commissioner of health at request of employees; form and content of notice and request; procedure

a. Any employee, group of employees or employee representative who believes that a violation of a health standard exists, or that an imminent danger exists, may request an inspection by giving notice to the Commissioner of Health of the violation or danger. The notice and request shall be in writing, shall set forth the grounds for the notice and shall be signed by the employee, a group of employees or employee representative. Upon the request of the person giving the notice, his name or the name of any employee representative giving the notice shall be withheld. The Commissioner of Health shall conduct an appropriate inspection at the earliest time possible. In any case of a possible imminent hazard, the commissioner may request the assistance of other State agencies having appropriate expertise.

The Commissioner of Health shall so interpret and administer this section so as to encourage any employee, group of employees or employee representative who believes that a violation of a health standard exists, or that an imminent danger exists, to report that violation or danger in the first instance to the employer's safety officer.

b. A representative of the employer, an employee giving the notice and an employee representative shall be given the opportunity to accompany the Commissioner of Health during an inspection for the purpose of aiding in such inspection. Where there is no authorized employee representative, the Commissioner of Health shall consult with a reasonable number of employees concerning matters of health in the workplace .

c. Any employee who accompanies the Commissioner of Health or the Commissioner of Community Affairs on an inspection shall receive payment of normal wages for the time spent during the inspection.

d. The information obtained by the Commissioner of Health under this section shall be obtained with a minimum burden upon the employer.

N.J.S.A. 34:6A-39. Temporary and permanent variances

a. Any employer may apply to the commissioner for a temporary order granting a variance from a standard or any provision thereof promulgated under this act. A temporary order shall be granted only if the employer files an application with the commissioner which meets the requirements of this section and establishes in a hearing conducted pursuant to the "Administrative Procedure Act," P.L.1968, c. 410 (C. 52:14B-1 et seq.) and P.L.1978, c. 67 (C. 52:14F-1 et seq.) that:

(1) he is unable to comply with the standard by its effective date because of the unavailability of professional or technical personnel or of materials and equipment needed to comply with the standard or because necessary construction or alteration of facilities cannot be completed by the effective date;

(2) he is taking all available steps to safeguard employees against the hazards covered by the standard; and

(3) he has an effective program for complying with the standard as quickly as practicable.

Any temporary order issued under this section shall prescribe the practices, means, methods, operations and processes which the employer shall adopt and use while the order is in effect and the order shall state in detail

what the employer's program shall be for complying with the standard.

A temporary order may be granted only if notice to the employees is given; provided, however, that the commissioner may issue one interim order to be effective until a decision is made on the basis of the hearing. An employee representative or, where one does not exist, the affected employees, may appear at the hearing, with or without counsel, and submit testimony concerning the employer's application for the variance. No temporary order may be in effect for longer than the period needed by the employer to achieve compliance with the standard or one year, whichever is shorter, except that such an order may be renewed no more than twice so long as the requirements of this section are met and if an application for renewal is filed at least 90 days prior to the expiration date of the order. No interim renewal of an order may remain in effect longer than 180 days.

b. An application for temporary variance shall contain:

- (1) a specification of the standard or portion thereof from which the employer seeks a variance;
- (2) a representation by the employer, supported by representations from qualified persons who have firsthand knowledge of the facts represented, that he is unable to comply with the standard or portion thereof and a detailed statement of the reasons therefore;
- (3) a statement of the steps he has taken and will take, with specific dates, to protect employees against the hazard covered by the standard;
- (4) a statement of when he expects to be able to comply with the standard and what steps he has taken and what steps he will take, with dates specified, to comply with the standard;
- (5) a certification that he has informed his employees of the application by giving a copy thereof to their employee representative where one exists, and posting a statement at the place where notices to employees are normally posted, giving a summary of the application and specifying where a copy may be examined. A description of the notification procedure used by the employer shall be contained in the certification. The information to the employees shall also inform them of their right to appear and be heard, as set forth in subsection a. of this section, at the hearing on the variance application; and
- (6) a statement, if appropriate, that such a variance is necessary to permit an employer to participate in an experiment approved by him designed to demonstrate or validate new and improved techniques to safeguard the health or safety of workers.

c. Any affected employer may apply to the commissioner for a rule or order for a permanent variance from a standard promulgated under this act. An employee representative or, where one does not exist, the affected employees, shall be given notice of each such application and shall be afforded an opportunity to participate in a hearing pursuant to the "Administrative Procedure Act," P.L.1968, c. 410 (C. 52:14B-1 et seq.) and P.L.1978, c. 67 (C. 52:14F-1 et seq.) on the merits of the application, with or without counsel, and to submit testimony. The commissioner shall issue such rule or order if he determines on the record, after an opportunity for an inspection, where appropriate, that the proponent of the variance has demonstrated, by a preponderance of the evidence, that the conditions, practices, means, methods, operations or processes used or proposed to be used by an employer will provide workplaces which are as safe and healthful as those which would prevail if he complied with the standard. The rule or order so issued shall prescribe the conditions the employer shall maintain and the practices, means, methods, operations and processes which he shall adopt and utilize to the extent they differ from any standard adopted pursuant to this act. Such a rule or

order may be modified or revoked upon application by an employer, any employee, group of employees or employee representative, or by the commissioner on his own motion, in the manner prescribed for its issuance under this section at any time after six months from its issuance.

d. In determining whether to grant a variance from a health standard, the commissioner shall consult with the Commissioner of Health.

N.J.S.A. 34:6A-40. Employers' records; availability to commissioner and commissioner of health; public inspection; notice to employees of exposure to toxic materials in excess of standards allowed; reports

In accordance with the regulations which shall be adopted by the commissioner, each employer shall make, keep, preserve and make available the following records to the commissioner and the Commissioner of Health:

a. Records regarding the employer's activities relating to this act as the commissioner deems necessary or appropriate for the enforcement of this act or for developing information regarding the causes and prevention of occupational accidents and illness.

b. Records regarding work-related deaths, injuries and illnesses other than minor injuries which require only first aid treatment and which do not involve medical treatment, loss of consciousness, restriction of work or of motion, or transfer to another job .

c. Records regarding employee exposure to potentially toxic materials or other harmful physical agents which the regulations require to be monitored or measured. The regulations shall provide employees or their representatives with an opportunity to observe the monitoring or measurement and access to the records of the monitoring or measurement. Each employee or former employee shall be informed of and have access to all records which will indicate his own exposure to toxic materials or harmful physical agents and the properties, characteristics and effects thereof. Each employer shall promptly notify any employee who has been or is being exposed to toxic materials or harmful physical agents in concentrations or at levels which exceed those prescribed by any safety and health standard promulgated under this act, and shall inform any employee who is being exposed of the corrective action being taken and the time limit for compliance pursuant to subsection a. of section 17 of this act. [FN1]

Each employer shall, in accordance with regulations which shall be adopted by the commissioner, file with the commissioner periodic reports based on the records kept pursuant to this section. The commissioner shall develop and maintain an effective program of collection, compilation, analysis and reporting to the public of statistics on work-related deaths, injuries and illnesses other than minor injuries which require only first aid treatment and which do not involve medical treatment, loss of consciousness, restriction of work or of motion, or transfer to another job, except that any information which identifies an individual employee shall be confidential. The commissioner shall promote, encourage or directly engage in programs of studies, information and communication concerning occupational safety and health statistics.

N.J.S.A. 34:6A-41. Violations; determinations; written order of compliance; posting; notice of intent to contest; failure to comply; penalties; enforcement; compromise and settlement

a. If the commissioner determines that an employer has violated a provision of this act, or a safety standard or regulation promulgated under this act, if the commissioner receives a certification from the Commissioner of Health that an employer violation has been determined to exist within the Commissioner of Health's

jurisdiction, or if the commissioner receives a report from the Department of Labor or the Department of Health, prepared as a result of the investigation of the death or serious injury of one or more firefighters, which indicates the existence of a violation of this act or of a safety standard promulgated under this act, he shall with reasonable promptness, and in no case more than six months after his determination or the receipt of the certificate or report, issue to the employer a written order to comply which shall describe the nature of the violation, including a reference to the provision of the section, standard, regulation or order alleged to have been violated, the sanction therefore, where appropriate, and shall fix a reasonable time for compliance.

b. If the commissioner issues to an employer an order to comply, the employer shall post such order or a copy thereof at or near each location of the violation cited in the order so that it is clearly visible to affected employees. The commissioner shall make such order available to employee representatives and affected employees, and shall make the order available to the public upon request.

c. If no notice of intent to contest any provision of the order is filed with the commissioner by an employer, employee or employee representative within fifteen working days of the issuance of an order to comply, the order shall be deemed final and not subject to review by any court or agency. If, within fifteen working days of the issuance of an order to comply, any employer, employee or employee representative files a notice with the commissioner of intent to contest any provision of the order, the commissioner shall immediately advise the Occupational Safety and Health Review Commission of the notification, and the commission shall afford an opportunity for a hearing. The review commission shall thereafter issue an order, based on a finding of fact, affirming, modifying, or vacating the commissioner's order to comply or the proposed penalty, or directing other appropriate relief, and the order shall become final 45 days after its issuance. The rules of procedure prescribed by the review commission shall provide affected employers, employees, or representatives of affected employees an opportunity to participate as parties to hearings under this subsection.

d. If the time for compliance with an order of the commissioner issued pursuant to this section elapses, and the employer has not made a good faith effort to comply, the commissioner shall impose a civil administrative penalty of up to \$7,000 per day for each violation of a provision of P.L.1983, c. 516 (C. 34:6A-25 et seq.), or of a standard or regulation promulgated under that act, or of an order to comply. Any employer who willfully or repeatedly violates the requirements of this section or any standard, rule, order or regulation promulgated under that act shall be assessed a civil administrative penalty of up to \$70,000 for each violation. Penalties imposed under this section may be recovered with costs in a civil action commenced by the commissioner by a summary proceeding under "the penalty enforcement law" (N.J.S. 2A:58-1 et seq.) in the Superior Court or a municipal court, either of which shall have jurisdiction to enforce "the penalty enforcement law" in connection with this act. If the violation is of a continuing nature, each day during which it continues after the date given for compliance in accordance with the order of the commissioner shall constitute an additional separate and distinct offense.

e. The commissioner is authorized to compromise and settle any claim for a penalty under this section in such amount as, in the discretion of the commissioner, may appear appropriate and equitable under all of the circumstances. In any claim involving investigations conducted by the Department of Health, the commissioner shall make the determination as to the compromise or settlement of the claim in consultation with the Commissioner of Health.

N.J.S.A. 34:6A-42. Occupational safety and health review commission; appeal; hearings; determination

a. There is established an Occupational Safety and Health Review Commission within the Department of Labor to hear appeals regarding orders to comply and penalties issued under this act. The commission shall

consist of three members appointed by the Governor from among persons who by reason of training, education or experience are qualified to carry out the functions of the commission. The Governor shall designate one of the members of the commission to serve as chairman.

b. Members of the review commission shall serve terms of four years and until their successors are appointed. The salaries, compensation and wages of the members of the commission shall be established by the commissioner. The Department of Labor shall provide the review commission with the support staff necessary for the review commission to perform its duties. The members and the support staff shall be reimbursed for necessary expenses incurred in the performance of their duties.

c. The review commission shall meet as often as is necessary to hear and rule on appeals regarding orders to comply and penalties issued under this act. The review commission shall adopt rules with respect to the procedural aspects of its hearings.

d. An employee or employee representative may participate as a party to any proceeding regarding the employees' employer before the review commission.

e. The review commission shall hear and make a determination upon any proceeding instituted before it, and shall make a report of the determination which shall constitute its final disposition of the proceedings. The report shall become the final order of the commission 45 days after the issuance of the report.

f. In the conduct of hearings the review commission may subpoena and examine witnesses, require the production of evidence, administer oaths and take testimony and depositions.

g. After hearing an appeal the review commission may sustain, modify or dismiss a citation or penalty.

N.J.S.A. 34:6A-43. Appeals from decision of review commission

Any appeal from a decision of the review commission shall be to the Appellate Division of the Superior Court.

N.J.S.A. 34:6A-44. Restraining orders

The Attorney General, at the request of and on behalf of the commissioner, may bring an action in the Superior Court to restrain any conditions or practices in any workplace which the commissioner determines, in accordance with section 17 of this act, [FN1] are such that a danger exists which could reasonably be expected to cause death or serious physical harm. Any order issued under this act may require such steps to be taken as may be necessary to avoid, correct or remove such imminent danger and prohibit the employment or presence of any individual in locations or under conditions where such imminent danger exists.

N.J.S.A. 34:6A-45. Discriminatory acts against employees; prohibition; restraining orders; waiver of benefits or requirements of act; invalidity

a. No person shall discharge, or otherwise discipline, or in any manner discriminate against any employee because such employee has filed any complaint or instituted or caused to be instituted any proceeding under or related to this section or has testified or is about to testify in any such proceeding, or because of the exercise by such employee on behalf of himself or others of any right afforded by this section.

b. Any employee who believes that he has been discharged, disciplined or otherwise discriminated against by

any person in violation of this section may, within 180 days after the employee first has knowledge such violation did occur, file a complaint with the commissioner alleging that discrimination. Upon receipt of the complaint, the commissioner shall cause an investigation to be made as he deems appropriate. If, upon that investigation, the commissioner or his designee determines that the provisions of this section have been violated, he shall, not more than 90 days after the receipt of the complaint, notify the employer and the employee of his determination, which shall include an order for all appropriate relief, including rehiring or reinstatement of the employee to his former position with back pay and reasonable legal costs. The notice shall become the commissioner's final determination, unless, within 15 days of receipt of the notice, the employer or employee requests a hearing before the commissioner or his designee, in which case the commissioner shall issue his final determination not more than 45 days after the hearing report is issued.

c. Nothing in this section shall be deemed to diminish the rights of any employee under any law, rule or regulation or under any collective negotiation agreement.

d. Any waiver by an employee or applicant for employment of the benefits or requirements of this act shall be against public policy and be void and any employer's request or requirement that an employee waive any rights under this act as a condition of employment or continued employment shall constitute an act of discrimination.

N.J.S.A. 34:6A-47. Advisors to commission of capital budgeting and planning on workplace safety and health

The Commissioner of Labor, the Commissioner of Community Affairs and the Commissioner of Health shall serve in an advisory capacity to the New Jersey Commission on Capital Budgeting and Planning on matters of workplace safety and health, to ensure that new construction meets the standards established by this act.

N.J.S.A. 34:6A-48. Act inapplicable to right to strike

Nothing in this act shall be deemed to give public employees the right to strike over occupational safety and health issues.

N.J.S.A. 34:6A-49. Inapplicability of act to State Uniform Construction Code Act or Uniform Fire Safety Act

Except as provided in section 6 of P.L.1983, c. 516 (C. 34:6A-30), nothing in this act shall be deemed to conflict with or supersede any provision of the "State Uniform Construction Code Act," P.L.1975, c. 217 (C. 52:27D-119 et seq.) or the code promulgated thereunder or to affect or limit the powers, duties, authorities and responsibilities of the Commissioner of Community Affairs or any enforcing agency thereunder. Except as provided in section 6 of P.L.1983, c. 516 (C. 34:6A-30), nothing in this act shall be deemed to conflict with or supersede any provision of the "Uniform Fire Safety Act," P.L.1983, c. 383 (C. 52:27D-192 et al.), or the code promulgated thereunder, nor affect or limit the powers, duties, authorities and responsibilities of the Commissioner of Community Affairs or any enforcing agency thereunder.

Whenever an action taken to comply with the provisions of this act makes it necessary for a property owner or employer to obtain a permit pursuant to the State uniform construction code, the owner or employer shall obtain the permit from the enforcing agency having jurisdiction. The commissioner shall inform any owner or employer who is required to take an action to be in compliance that it is the responsibility of the owner or employer to contact the agency having jurisdiction to determine whether a permit is required and to obtain any required permit.

APPENDIX

II

NJ PUBLIC EMPLOYEES OCCUPATIONAL HEALTH AND SAFETY ACT REGULATIONS

STANDARDS FOR FIREFIGHTERS

N.J.A.C. 12:100-10.1 Scope; standards information

- (a) This subchapter shall apply to all public employment as provided below:
1. This subchapter contains requirements for the organization, training, and personal protective equipment of fire service organizations whenever an employer establishes them.
 2. The requirements of this subchapter shall apply to all fire service members in the public sector performing structural fire fighting.
- (b) This subchapter shall not be applicable to:
1. Construction, agriculture and maritime employment;
 2. Airport crash rescue; or
 3. Forest firefighting operations.
- (c) The CGA and NFPA standards incorporated in this subchapter by reference may be obtained by contracting the issuing entities at the addresses listed in N.J.A.C. 12:100-17.3.

N.J.A.C. 12:100-10.2 Definitions

(a) The following words and terms, when used in this subchapter, shall have the following meaning unless the context clearly indicates otherwise.

"**Approved**" means the term as defined at N.J.A.C. 12:100-2.1.

"**CGA**" means Compressed Gas Association.

"**Confined space**" means the term as defined at 29 CFR 1910.146(b).

"**Damaged equipment**" means equipment which has been affected by external forces such as, but not limited to, mechanical, thermal, chemical or hydraulic, to an extent whereby the equipment no longer performs its original function to the extent required for the users' safety.

"**Education**" means the process of imparting knowledge or skill through systematic instruction.

"**Employee**" means the term as defined at N.J.A.C. 12:100-2.1.

"**Employer**" means the term as defined at N.J.A.C. 12:100-2.1.

"**Enclosed structure**" means a structure with a roof or ceiling and at least two walls which may present hazards to employees, such as accumulations of smoke, toxic gases and heat, similar to those found in buildings.

"**Fire brigade**" means an organized group of firefighters who are public employees who have an obligation to fight fires but who may be assigned to other duties.

"**Fire department**" means an organized group of employees organized by a public employer who are knowledgeable, trained and skilled in basic firefighting operations.

"**Firefighter**" means a member of the fire service who engages in the physical activity of rescue, fire

suppression or both, in buildings, enclosed structures, vehicles, vessels or like properties that are involved in a fire or emergency situation.

"**Fire service**" means a fire department or fire brigade.

"**Helmet**" means a head protective device consisting essentially of a shell, an energy absorbing system, a retention system, fluorescent retro-reflective markings, ear covers and face shield.

"**Interior structural firefighting**" means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage.

"**NFPA**" means the National Fire Protection Association.

"**Overhaul**" means the final control of a fire with suppression of the main body of the fire and other pockets of fire, searching for victims and performing salvage operations.

"**Positive-pressure apparatus**" means an open or closed-circuit apparatus in which the pressure inside the face piece in relation to the immediate environment is positive during both inhalation and exhalation.

"**Quick disconnect valve**" means a hand-operated device which provides a means for connecting and disconnecting the air cylinder to the self-contained breathing apparatus.

"**Remanufactured**" means the complete dismantling and reassembly of the fire apparatus body with or without removal from the chassis during the process.

"**Respiratory protective device**" means a breathing device designed to protect the wearer from an oxygen-deficient or hazardous atmosphere.

"**SCBA**" means self-contained breathing apparatus.

"**Self-contained breathing apparatus**" means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.

"**Service life**" means the period of time that a respirator has been rated to provide protection to the wearer.

"**Unserviceable**" means past useful life of garment or protective gear, or those that have been declared unsafe.

"**Vapor-barrier**" means that material used to substantially prevent or inhibit the transfer of water, corrosive liquid, steam or other hot vapors from the outside of a garment to the wearer's body.

N.J.A.C. 12:100-10.3 Organization, training and education

(a) The employer shall prepare and maintain a statement or written policy which contains the following:

1. The basic organizational structure of the fire service;
2. The expected number of members in the fire service; and
3. The functions that the fire service is to perform.

(b) The organizational statement shall be available for inspection by the Commissioner of Labor and by the employees or their designated representative.

(c) Training and education requirements are as follows:

1. The employer shall provide training and education for all fire service members commensurate with those duties and functions that fire service members are expected to perform. Such training and education shall be provided to fire service members before they perform fire service emergency activities. Fire service leaders and training instructors shall be provided with training and education, which is more comprehensive than that provided to the general membership of the fire service.
2. The employer shall assure that training and education is conducted frequently enough to assure that each member of the fire service is able to perform the member's assigned duties and functions satisfactorily and in a safe manner so as not to endanger fire service members or others. All fire service members shall be provided with training at least annually. In addition, fire service members who are expected to perform interior structural fire fighting shall be provided with an education session or training at least quarterly.

3. The quality of the training and education program for fire service members shall be similar to those conducted by such fire training schools as the Maryland Fire and Rescue Institute; Iowa Fire Service Extension; West Virginia Fire Service Extension; Georgia Fire Academy; New York State Department, Fire Prevention and Control; Louisiana State University Firemen Training Program, or Washington State's Fire Service Training Commission for Vocational Education. (For example, for the oil refinery industry with its unique hazards, the training and education program for those fire service members shall be similar to those conducted by Texas A & M University, Reno Fire School, or the Delaware State Fire School.)

4. The employer shall inform fire service members about special hazards such as storage and use of flammable liquids and gases, toxic chemicals, radioactive sources and water reactive substances to which they may be exposed during fire and other emergencies. The fire service members shall also be advised of any changes that occur in relation to the special hazards. The employer shall develop and make available for inspection by fire service members written procedures that describe the actions to be taken in situations involving the special hazards and shall include these in the training and education program.

5. The employer shall provide each member of the fire service training in HAZMAT Operations Level I, Bloodborne Pathogens, Incident Management System Training Orientation (I-100), and where applicable, Confined Space Entry Rescue Operations, Trench Rescue Operations and High Angle and Technical Rescue Techniques. All training shall be consistent with the applicable PEOSH Standard.

6. The employer shall comply with the Hazard Communications Standard, N.J.A.C. 12:100-7, and relevant parts of the New Jersey Worker and Community Right to Know Act.

N.J.A.C. 12:100-10.4 Personnel; limitations on ability to perform

(a) The employer shall assure that employees who are expected to do interior structural firefighting are physically capable of performing duties, which may be assigned to them during emergencies.

1. Prior to appointment as a structural firefighter, all individuals shall have successfully passed a medical evaluation, which meets the Medical Evaluation Protocol required under the Respiratory Protection Program Standard, 29 CFR 1910.134. Failure to pass said examination shall exclude the individual from serving as a structural firefighter.

(b) The employer shall assure that compliance with (a) above shall be accomplished in conformity with the provisions of the Americans with Disabilities Act of 1990.

N.J.A.C. 12:100-10.5 Protective clothing

(a) The employer shall provide, at no cost to the employee, and assure the use of, protective clothing which complies with this subchapter.

(b) Firefighters performing interior structural firefighting and overhaul shall be provided with, and required to wear, the equipment covered in this subchapter.

(c) The employer shall assure that:

1. Protective clothing protects the head, body and extremities, and consists of at least the following components: body protection, eye, face and head protection;

2. Protective clothing ordered or purchased after the effective date of this subchapter shall comply with this subchapter; and

3. Firefighters wear foot, leg and body protective clothing complying with this subchapter.

N.J.A.C. 12:100-10.6 Protective clothing; foot and leg protection

- (a) Foot and leg protection shall comply with this section for all firefighters.
 - 1. Protective footwear shall comply with NFPA 1974-1987, Protective Footwear for Structural Firefighting.

N.J.A.C. 12:100-10.7 Protective clothing; body protection

- (a) Body protection shall comply with this section for all firefighters.
- (b) Body protection shall be achieved by the wearing of a fire resistive coat and bunker pants, both of which shall be at least equivalent to NFPA 1971-1986, Protective Clothing for Structural Firefighting, incorporated herein by reference. For career firefighters, body protection must be worn in combination with a station/work uniform or apparel complying with (c) below. If the employer issues or requires the wearing of uniforms for volunteer firefighters, the uniform must comply with (c) below.
- (c) Station/work apparel shall be provided to the career firefighter as follows:
 - 1. The performance, construction and testing of station/work uniforms shall be at least equivalent to NFPA 1975-1985, Station/Work Uniforms for Firefighters, incorporated herein by reference; or
 - 2. Apparel issued to the firefighter must be of a non-meltable material, such as cotton.

N.J.A.C. 12:100-10.8 Protective clothing; hand protection

- (a) Hand protection shall consist of protective gloves or a glove system which will provide protection against cuts, punctures and heat penetration.
- (b) The performance, construction, and testing of gloves for structural firefighters shall be at least equivalent to NFPA 1973-1988, Gloves for Structural Fire Fighting incorporated herein by reference.

N.J.A.C. 12:100-10.9 Protective clothing; head, eye and face protection

- (a) Head protection shall consist of a protective head device with ear flaps and chin strap which meet the performance, construction and testing requirements of 29 CFR Part 1910.156(e)(5) or NFPA 1972-1987, Helmets for Structural Fire Fighting.
- (b) Full facepieces, helmets, goggles or hoods of breathing apparatus which comply with 29 CFR 1910.134 and N.J.A.C. 12:100-10.10 shall be deemed to comply with (a) above.
- (c) A full protective hood shall be provided for the firefighter that meets the performance, construction, and testing requirements of NFPA 1971-1991, Protective Clothing for Structural Fire Fighting.
 - 1. Firefighters shall be provided with a full protective hood provided that if the wearing of the hood interferes with the proper fit of the helmet, a full protective hood need not be provided until the helmet becomes unserviceable and is replaced.

N.J.A.C. 12:100-10.10 Respiratory protection devices

- (a) The employer shall ensure that respirators are provided to, and used by firefighters, and that the respirators meet the requirements of 29 CFR 1910.134 and this section.
- (b) Approved self-contained breathing apparatus with a full-facepiece, or with approved helmet or hood configuration, shall be provided to, and worn by, firefighters as follows:
 - 1. While engaged in interior structural firefighting;
 - 2. While working in confined spaces where toxic products of combustion or an oxygen deficiency may be present;
 - 3. During emergency situations involving toxic substances; and

4. During all phases of firefighting and overhaul.

(c) The employer shall assure that:

1. Respirators ordered or purchased after January 4, 1993 shall be at least equivalent to NFPA 1981-1987, Open-Circuit Self-Contained Breathing Apparatus for Fire Fighters, incorporated herein by reference; and
2. All firefighters shall wear respirators complying with this subchapter except that existing respirators meeting the previous OSHA standards that are superseded by this subchapter may continue to be worn until such time as the respirator becomes unserviceable.

(d) The employer shall establish and maintain a respiratory protection program, which includes the requirements of 29 CFR 1910.134, Respiratory Protection, with amendments published in the Federal Registry through April 23, 1998 and any subsequent amendments thereto, are incorporated and adopted herein by reference as standards applicable to firefighters for respiratory protection.

(e) Existing respirators meeting the previous OSHA standards that are superseded by this subchapter:

1. May be used with approved cylinders from other approved self-contained breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet the United States Department of Transportation (49 CFR Parts 100 through 199) and National Institute for Occupational Safety and Health (42 CFR Part 84) criteria.
2. Can be switched from a demand to a positive pressure mode. However, such apparatus shall be in the positive pressure mode when firefighters are performing interior structural firefighting operations or overhaul.

N.J.A.C. 12:100-10.11 Life-safety rope, harnesses and hardware

(a) This section is intended to apply to fire departments that train and perform rope rescue services. All employees that are required by the fire department to participate in such rescue services shall be provided with the proper equipment meeting the requirements of this section.

(b) The employer shall provide, at no cost to the employee, and assure the use of, life-safety rope, harnesses, and hardware which comply with this section.

(c) The employer shall assure that the life-safety rope, harnesses and hardware complying with this section are used to support fire service personnel during rescue, firefighting, and other emergency operations, or during training exercises.

(d) The performance, construction and testing of ropes, harnesses, and hardware for firefighters shall be at least equivalent to NFPA 1983-1985, Fire Service Life-Safety Rope, Harnesses and Hardware, incorporated herein by reference.

(e) Life-safety rope, harnesses and hardware need only be provided in those departments that perform rope rescue services and to employees who perform such services.

N.J.A.C. 12:100-10.12 Personal alert safety system

(a) The employer shall provide, at no cost to the employee, and assure the use of, a personal alert safety system which complies with this section.

(b) The employer shall assure that all firefighters wear personal alert safety systems that comply with this section by January 4, 1994, except that personal alert safety systems complying with NFPA 1982-1983, Personal Alert Safety Systems (PASS) for Fire Fighters, may continue to be used until they become unserviceable.

(c) The performance, construction and testing of a personal alert safety system for a firefighter shall be at least equivalent to NFPA 1982-1988, Personal Alert Safety Systems (PASS) for Fire Fighters, incorporated herein by reference.

(d) Approved personal alert safety systems shall be provided and worn by the firefighter as follows:

1. While engaged in interior structural firefighting;
2. While working in confined spaces;
3. During all phases of overhaul; and
4. The PASS device shall be attached to the exterior of the firefighter's turnout gear.

N.J.A.C. 12:100-10.13 Hearing protection

(a) This section is intended to provide hearing protection to the firefighter in non-emergency situations. An example of a non-emergency situation requiring hearing protection to the employee would be during the testing of equipment creating a noise level exceeding 90 decibels (dBa). The hearing conservation program described should be in writing and may be incorporated into standard operating procedures (SOP).

(b) The fire department shall provide hearing protection for all members when they are exposed to noise in excess of 90 dBa from power tools or equipment, except for situations where the use of hearing protection devices would create an additional hazard to the user.

(c) The fire department shall engage in a hearing conservation program to identify and reduce or eliminate potentially harmful sources of noise in the work environment.

(d) The provisions of [29 CFR 1910.95](#), Occupational Noise Exposure, incorporated at N.J.A.C. 12:100-4 are applicable to this subchapter.

N.J.A.C. 12:100-10.14 Filling air cylinders

(a) Air cylinders for respiratory equipment shall be filled only by trained personnel.

(b) The charging station shall be equipped with proper facilities to ensure the safety of the charging station operator and nearby personnel.

N.J.A.C. 12:100-10.15 Fire apparatus operations

(a) Whenever a fire apparatus leaves the fire station in response to a fire alarm, all firefighters, except the driver of the fire apparatus, shall have donned their protective clothing before the apparatus is in motion. The term "fire apparatus" does not include an automobile.

(b) The employer shall provide restraining devices for all firefighters aboard a fire apparatus. Restraining devices may include protective seating, seatbelts, or vehicle harnesses for all firefighters aboard.

(c) All fire apparatus purchased and/or remanufactured after January 4, 1993 shall provide enclosed seating with seatbelts for all personnel riding on the apparatus, complying with the following standards, incorporated herein by reference:

1. NFPA 1901-1991 Pumper Fire Apparatus;
2. NFPA 1902-1991 Initial Attack Fire Apparatus;
3. NFPA 1903-1991 Mobile Water Supply Fire Apparatus; and
4. NFPA 1904-1991 Aerial Ladder and Elevating Platform Fire Apparatus.

N.J.A.C. 12:100-10.16 Maintenance of firefighter equipment

(a) Firefighting equipment required under this subchapter shall be maintained and inspected by the employer at least annually to ensure the safe operational condition of the equipment. Damaged equipment or equipment found to be in unserviceable condition shall be removed from service and replaced.

(b) All fire department aerial apparatus is to be subject to visual inspection, operational tests and load tests at least annually in accordance with NFPA 1914-1991, Testing Fire Department Aerial Devices. Complete inspections and tests including, the non-destructive testing defined in NFPA 1914-1991, Testing Fire Department Aerial Devices, shall be conducted whenever visual inspection or load testing indicates a potential problem or at least every five years. Any device that fails a test shall be immediately removed from service and shall not be returned to service until properly repaired and retested. In addition, pumper fire apparatus shall be inspected at least annually in accordance with criteria of NFPA 1911-1997; initial attack fire apparatus shall be inspected at least annually in accordance with criteria of NFPA 1911-1997; and mobile water supply fire apparatus shall be inspected at least annually in accordance with criteria of NFPA 1911-1997. Each inspection shall include road-worthiness and safety equipment.

APPENDIX III THE NEW JERSEY WORKER AND COMMUNITY RIGHT TO KNOW ACT

MAJOR PROVISIONS OF RIGHT TO KNOW LABELING FOR PUBLIC EMPLOYERS

The labeling requirements were amended on August 2, 1993 and January 3, 1994 to provide additional options and exclusions from labeling. The new provisions are in bold print in this informational bulletin.

GENERAL PROVISIONS (N.J.A.C. 8:59-5.1 AND 5.2)

The New Jersey Right to Know labeling requirements provide for exact identification of chemicals in the workplace by using the chemical names and Chemical Abstracts Service (CAS) numbers* of the chemicals. Container** labels must list the chemical name and CAS number of the five most predominant chemical ingredients in the container whether they are hazardous or non-hazardous. This is commonly referred to as "universal labeling." Any hazardous ingredients which are not in the top five ingredients must also be listed on the label (except if it is below 1% or below 0.1%, for carcinogens, mutagens, and teratogens). The Right to Know Hazardous Substance List provides a list of synonyms of chemical names which may also be used on the label. For chemicals not listed on the Right to Know Hazardous Substance List, any chemical name recognized by the Chemical Abstracts Service may be used.

Example:

NAME	CAS#
Hydroquinone	123-31-9
Paraformaldehyde	30525-89-4
Sodium Methanal Bisulfite	870-72-4
Triethylene Glycol	112-27-6
Water	7732-18-5
Sodium Sulfite	7757-83-7

If the content of the container is not known or if only some of the contents are known, the container must bear a label stating either "Contents Unknown" or "Contents Partially Unknown" and a good faith effort must be made to find out the ingredients. In the latter case, whatever chemicals are known must be listed on the label.

Examples:

CONTENTS UNKNOWN

NAME	CAS#
Hydroquinone	123-31-9
Paraformaldehyde	30525-89-4

Contents Partially Known

A good faith effort must involve at least two contacts by letter and/or documented phone calls to the product's manufacturer or supplier. If an employer finds out any additional ingredients of a product, the employer has up to 5 working days to add these ingredients to the existing label on the container.

You may find that one or more of the ingredients is considered a trade secret. In this case, the manufacturer may provide you with a New Jersey Trade Secret Registry Number (TSRN) to be used in place of the specific chemical substance name and CAS number on the label. A trade secret substance may be hazardous or non-hazardous but should never be a substance that is a carcinogen, mutagen or teratogen. An acceptable label would appear as follows:

NAME	CAS#
Hydroquinone	123-31-9
Paraformaldehyde	30525-89-4
Water	7732-18-5
Sodium Sulfite	7757-83-7
TSRN 43891000-5002p	
NJ TSRN 42-003-19642	

WHAT THE LABEL SHOULD LOOK LIKE

The label must be a sign, emblem, sticker or marker of a durable nature affixed to or stenciled onto a container. The printing on these labels must be easy to read, not obscured, and prominently displayed on the container. (N.J.A.C. 8:59-5.8)

WHEN MUST CONTAINERS BE LABELED?

Labels must be affixed to new direct use containers before containers are opened or within five working days of the container's arrival at the facility, whichever is sooner. A "direct use" container is the container that directly holds the product, such as a can of paint or a 55 gallon drum.

Containers that are packed in shipping containers (e.g. boxes) do not need to be labeled until they are removed from the shipping container. The shipping container boxes do not need to be labeled since they are already labeled pursuant to USDOT requirements. Be sure to check new containers to see if the manufacturer or vendor has already labeled the containers. Shelf labeling is not allowed!

SPECIAL CIRCUMSTANCES

- Containers which are present in offices that are used for office work do not need to be labeled. (Storage rooms, print shops, and other areas not used for office work in an office building are not included in this exemption.)

- Containers which are two ounces or smaller may be labeled by means of a code or number system if the code or number system will allow the employee or emergency responder ready access to the names and CAS numbers or the trade secret registry numbers of the ingredients. If **direct use containers** are on a skid *and* it is not possible to get to all of the containers without breaking down the skid, only those containers on the outside face of the skid and within reach of the employee need to be labeled.

If the skid is shrink-wrapped, labels must be placed on the shrink-wrap on all four sides of the skid. If unlabeled **direct use** containers are removed from the skid, they must be labeled immediately.

- For petroleum products, the Department of Health and Senior Services will allow the following names (without CAS #'s) on labels:
 1. For motor oil, the name "motor oil" can appear on the label.
 2. For automatic transmission fluid, the name "automatic transmission fluid" can appear on the label.
 3. For brake fluid, the name "brake fluid" can appear on the label.
 4. For heating oil, the name "fuel oil" should appear on the label.
 5. **For diesel fuel, the name "diesel fuel" can appear on the label.**
 6. For grease, gear oil, hydraulic oil, cutting oil, lubricating oil, and other petroleum oil based products, the name should be combined with Petroleum Oil such as "Petroleum Oil (Grease)".

If a product is not petroleum oil based, then the words "Petroleum Oil" should not be included on the label. A CAS number would only be required on the label if the product has an assigned CAS number. Also, if a petroleum product contains a hazardous substance listed on the New Jersey Right to Know Hazardous Substance List, as an additive, that hazardous substance must be included on the label (with its CAS number).

- In approved Research and Development (R & D) Laboratories, **public employers may:** (a) label containers by means of a code or number system if the code or number system allows an employee or emergency responder ready access to the names and CAS numbers or the trade secret registry numbers of the ingredients in the containers, **or (b) label containers in accordance with the Public Employees Occupational Safety and Health Act (PEOSHA) Laboratory Standard. (Contact the PEOSH Program at (609) 984-1863 for the requirements of this Standard.)** To become an approved R & D laboratory, an application must be filed with and approved by the Department of Health and Senior Services. To obtain an application for a Research and Development Laboratory exemption, contact the NJDHSS at (609) 292-2202. (N.J.A.C. 8:59-5.3)
- If a subcontractor stores hazardous or other substances at a public employer's facility, the public employer must insure that these containers are properly labeled. (N.J.A.C. 8:59-5.10)
- Valves, outlets, sample connections, drains and vents of pipeline systems must be labeled if these points allow the release of a substance into the environment: (1) at least once during a twenty-four hour period; or (2) once a month when making repairs or conducting maintenance activities. Also, any valve located at the point at which a substance enters a facility's pipeline system must bear a label. This situation usually is found in water filtration plants, wastewater treatment plants, power plants and motor vehicle maintenance garages. (N.J.A.C. 8:59-5.2)

CONTAINERS THAT DO NOT NEED TO BE LABELED

The following substances and containers do not need to be labeled (and do not need to be reported on the Right To Know Survey) because "they are excluded from coverage under the law. These

include:

- Any solid article (a manufactured item formed to its final shape or design) which is not used in a manner which changes its physical form, and which does not pose any acute or chronic health hazard to employees or emergency responders who are exposed to it.

Examples:	
Ammunition	Pills and capsules
Bars of soap	
Chalk	Photocopier toners and Developers in
Dry cell batteries	self-contained cartridges
Glue sticks	
Grinding wheels	Polaroid film
Pastels	Sorbent sample tubes
Pens	Thermometers

- Consumer products if they are not used more frequently than a consumer would use them at home.
- Any fuel in a motor vehicle.
- Containers which are removed from a larger, properly labeled container, are only used by the employee who performs the removal, and are used up by that employee during his or her work shift.
- Process containers. These containers include:
 - a. containers whose contents are changed at least once per shift;
 - b. test tubes, beakers, flasks, or other containers which are regularly used and reused for different substances;
 - c. containers of ten gallons or less into which a worker has poured a substance from a labeled container and which is used by the employee who performed the transfer;
 - d. containers on which labels would be obscured by heat, spillage, or other factors.
- Typewriter correction fluid
- **Products which are the personal property and are for the personal use of an employee.**
- Containers of bottled water intended for drinking purposes, drinking fountains, sinks, toilets, showers, safety showers, eye washes, soap dispensing units in bathrooms, fire hydrants, fire hose racks, sprinkler heads, and fire extinguishers.
- Sand bags and buckets, MSA Air Pak Respirators, portable grease guns, electrodes, biological organisms, tobacco products, wood products, and food and food additives intended for human or animal consumption also are exempted from labeling.
- **Substances which are an integral part of a facility structure or furnishings.**
- **Materials kept in an evidence locker or room by a law enforcement agency.**

PRODUCTS AND SUBSTANCES THAT DO NOT REQUIRE ADDITIONAL LABELING

Containers that are labeled according to certain Federal and State laws do not need a Right to Know label. (N.J.A.C. 8:59-5.5 and 5.6) (However, they still *have to be reported on* the Right to Know Survey if they are hazardous.) These include:

- **Products in containers that are two kilograms (4.4 pounds) or two liters (0.53 gallons) or smaller that are labeled according to the OSHA Hazard Communication Standard (29 CFR 1910.1200.)**

Note: However, if containers below this threshold contain ingredients which are carcinogens, mutagens or teratogens, these ingredients and their CAS numbers must be listed on the label. Also, if the product as a whole, meets the Special Health Hazard criteria for highly flammable (F3 or F4), reactivity/explosivity (R4, R3 or R2), or corrosivity, only those ingredients that contribute to the Special Health Hazard and their CAS numbers, must be listed on the label. (See N.J.A.C. 8:59-10.2 for Special Health hazard criteria.)

A Hazard Communication Standard label must contain the identity of the product and appropriate hazard warnings. The identity is any term used as a product identifier which serves as a link between the label and a Material Safety Data Sheet. The identity used may be a trade name ("Black Magic Formula"), or a chemical name (1,1,1-Trichloroethane). The hazard warning is any type of message, words, pictures, or symbols that conveys the hazards of the chemical(s) in the container. Employers purchasing chemicals can usually rely on the labels provided by their suppliers.

HAZARD COMMUNICATION LABEL REQUIREMENTS

Product Identifier	SUPER FLOOR STRIPPER
Manufacturer's Name & Address	123 MAIN STREET MOPPIN, NJ 00000
Hazard Warning	FLAMMABLE! KEEP AWAY FROM HEAT, SPARKS AND OPEN FLAME. MAY CAUSE EYE IRRITATION. NAUSEA, AND DIZZINESS FROM EXCESSIVE INHALATION.
Target Organs	T A R G E T O R G A N S - SKIN, EYES, CENTRAL NERVOUS SYSTEM.

- Containers displaying labels pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). These products display the phrase "EPA Reg No. #". For example, disinfectants, pesticides, herbicides, and fungicides are all labeled according to FIFRA.

Example of a FIFRA Label

Active Ingredients	
0,0-diethyl O-(2 isopropyl-6 methyl -4 pyrimidinyl) Phosphorothioate5.00% EPA Reg. No. 0011-00-1111
Inert Ingredients	95.00% EPA Est. No. 0011-0H-1
Total	100.00%

- All shipping cartons, which are not direct use containers, that are labeled according to USDOT requirements. It is the responsibility of your supplier to meet this requirement. If USDOT regulations do not require a label on the shipping container, then none shall be required. (N.J.A.0 8:59-5.1(q))

Examples:

CONSUMER COMMODITY
ORM-D

Liquid Cleaning Compound
NA 1993

Direct use single substance containers that are labeled with specific chemical substance shipping names and their four digit UN or NA identification numbers from the U.S. Department of Transportation's (DOT) Hazardous Materials Table, 49 CFR Part 172.101.

Example:

Toluene
UN 1294

Traffic Paint Reducer

- Containers containing hazardous waste material that are labeled pursuant to the Federal Resource Conservation and Recovery Act (RCRA) or the New Jersey Solid Waste Management Act.

Examples:

Waste Oil 1270

Hazardous Waste

- Containers that are labeled pursuant to the Federal Food, Drug, and Cosmetic Act (FDCA). For example, hand soaps are usually considered drugs or cosmetics, and rubbing alcohol is considered a drug.

Drug Example: Cosmetic Example:

Isopropyl Alcohol 70% by Volume

Hairspray, nail polish, etc.

- Containers containing radioactive materials regulated by the Atomic Energy Act (AEA) and the Nuclear Regulatory Commission (NRC)
- For other exemptions, refer to N.J.A.C. 8:59-5.5

SAMPLE PURCHASE ORDER AND SERVICE CONTRACT LANGUAGE

New Jersey manufacturers are required to include New Jersey Right to Know labeling on all containers. However, to obtain containers with New Jersey RTK labeling for those products manufactured outside of New Jersey, you can include a clause requiring New Jersey RTK labeling as a term or condition of your purchasing contract. If this clause is used, it will be effective only if it is enforced by you, the purchaser.

Public employers must also ensure that all containers which are stored at their facilities by subcontractors display RTK labeling. Be sure to address this issue in your service contracts.

The following is a sample clause that could be used (for both in-state and out-of-state suppliers and manufacturers) in purchase orders and service contracts:

- All direct use containers shall bear a label indicating the chemical name(s) and Chemical Abstracts Service number(s) of all hazardous substances in the container, and all other substances which are among the five most predominant substances in the container, or their trade secret registry number(s). (N.J.A.C. 8:59-5)
- "Container" means a receptacle used to hold a liquid, solid or gaseous substance such as bottles, bags, barrels, cans, cylinders, drums and cartons. (N.J.A.C. 8:59-1.3)

You can refer vendors to the New Jersey Department of Health and Senior Services Right to Know Program for assistance in developing proper labels.

APPENDIX IV REGULATIONS FOR THE NJ PERSONNEL ACCOUNTABILITY SYSTEM

SUBCHAPTER 2 INCIDENT MANAGEMENT SYSTEM: PERSONNEL ACCOUNTABILITY

5:75-1.5 Definitions

The following terms shall have the meanings indicated except where the content clearly indicates otherwise:

"Branch" means an organizational level having functional or geographical responsibility for major aspects of incident operations.

"Commissioner" means the Commissioner of Community Affairs.

"Division" means the organization level having responsibility for operations within a defined geographic area.

"Emergency incident" means any situation to which the fire department responds to deliver emergency services including, but not limited to, rescue, fire suppression, emergency medical care, special operations, and other forms of hazard control and mitigation.

"Fire department" means a fire service organization providing rescue, fire suppression and related activities. The term "fire department" shall include any public, governmental fire service organization engaging in this activity.

"Group" means an organizational level having responsibility for operations within a defined functional area.

"Hazardous area" means any location(s) that may pose a safety and/or health risk to firefighters due to, but not limited to, the presence of products of combustion, the existence of hazardous or otherwise oxygen deficient or oxygen enriched atmosphere, the potential for any immediately dangerous to life and health atmosphere, the use of hazardous equipment or operations, or the potential for any of these situations to exist. Additionally, any area or location that predisposes a firefighter to become lost, disoriented, or trapped, including any structure, confined space and wild land areas, shall be considered a hazardous area.

"Incident action plan" means an oral or written plan containing general objectives reflecting the overall strategy for managing an incident.

"Incident commander" means the individual responsible for all incident activities, including the development of strategies and tactics and the ordering and release of resources.

"Incident management system" means a nationally recognized and organized system of rules, responsibilities and standard operating procedures used to manage emergency operations.

"Logistics section" means the section responsible for providing facilities, services, and material support for an incident.

"Member" means a person, at least 18 years of age, who is involved in performing the duties and responsibilities of a fire department, under the auspices of the organization. For the purpose of this chapter, a fire department member may be a full-time or part-time employee, a paid or unpaid volunteer, may occupy any position or rank within the department and may or may not engage in emergency operations.

"Personnel accountability officer" means the person designated by the Incident Commander to monitor entry into and exit out of hazardous areas for the purpose of ensuring accountability of all personnel in the hazardous area or structure.

"Personnel accountability report" means the results of an accounting of all personnel on the emergency incident scene to the Incident Commander.

"Personnel accountability roll call" means the process of accounting of all personnel on the emergency incident scene.

"Safety officer" means a member of an incident command staff responsible for monitoring and assessing safety hazards and unsafe conditions, and for developing measures for ensuring personnel safety.

5:75-2.4 Personnel accountability

(a) As an integral part of the incident management system used by the fire service, personnel accountability shall be maintained through the use of a personnel accountability system meeting the requirements of this section as a means to track and locate all fire department personnel operating at all emergency incidents.

(b) Every member of a fire department shall be issued a minimum of two personnel accountability tags.

1. Such tags shall be constructed of (but not limited to) metal, plastic, plastic laminated paper, plastic laminated cardboard, or similar durable material.
2. Each tag shall be equipped with a latch hook that will allow attachment of the tag to the firefighter's protective clothing. The clip or latch hook shall be designed to be attached and removed by a firefighter with a gloved hand.
3. At a minimum, the tag shall be engraved, imprinted, or otherwise marked or electronically coded with the firefighter's name and fire department affiliation.

(c) At each incident, the Incident Commander shall designate a personnel accountability officer. The personnel accountability officer shall be responsible for ensuring that all personnel are accounted for. The personnel accountability officer may serve other functions at an incident scene if he or she is able to safely perform the accountability function. At minor incidents, the Incident Commander may retain this function as he or she sees fit.

(d) To ensure personnel accountability, each firefighter shall take the following steps:

1. Upon arrival at an incident scene, each firefighter shall surrender the primary personnel accountability

tag at a central collection point as designated by the Incident Commander or departmental policy. Such point may be a command post or the apparatus to which the firefighter is assigned;

2. Upon leaving the incident scene, each firefighter shall immediately retrieve his or her personnel accountability tag from the designated collection point and reattach it to the designated area of his or her protective gear as determined by the fire department;

3. Firefighters assigned to a specific piece of apparatus for the duration of a tour of duty shall leave their primary personnel accountability tag on that apparatus for the duration of their tour.

(e) Upon entry in a hazardous area, each firefighter shall surrender the secondary personnel accountability tag to the personnel accountability officer who shall be in close proximity to the entry point into the hazardous area. Upon leaving the hazardous area, the member shall immediately retrieve his or her personnel accountability tag from the personnel accountability officer and re-attach it to the designated area of his or her protective clothing.

(f) If the need arises to evacuate a hazardous area and an evacuation is ordered, the personnel accountability officer shall:

1. Order an immediate personnel accountability roll call of all members operating at the incident to be conducted as soon as they exit the hazardous area;

2. Assure that every member who has surrendered his or her accountability tag retrieves it and reattaches it to their protective gear;

3. Report immediately to the Incident Commander when crews have not retrieved their personnel accountability tags after a reasonable time, members are unaccounted for, and the need for search and rescue exists or if conditions indicate that the area is immediately unsafe for crews and/or the personnel accountability officer to operate in safely; and

4. Report to the Incident Commander that all members are accounted for if the personnel accountability officer is not holding any personnel accountability tags after an evacuation is ordered.

(g) The Incident Commander shall call for a personnel accountability report:

1. If there is a report of a firefighter missing;

2. When an emergency evacuation is ordered;

3. When the incident is declared under control;

4. When changing attack modes (that is, offensive to defensive); or

5. Anytime the Incident Commander feels it necessary to conduct a personnel accountability report.

(h) When it is announced that a personnel accountability report is to be provided to the Incident Commander, all companies will:

1. Conduct a personnel accountability roll call of the members in that company to ensure all members are accounted for;

2. Cease all but emergency radio communications; and

3. Report all members accounted for or report members missing.

(i) Nothing in this section shall restrict the use of more sophisticated accountability systems utilizing bar coding, geographic positioning systems or similar methods providing the intent of this section is met.

APPENDIX

V

REGULATIONS FOR THE NJ INCIDENT MANAGEMENT SYSTEM

SUBCHAPTER 2: FIRE SERVICE INCIDENT MANAGEMENT

N.J.A.C. 5:75-2.1 Incident management system adopted

(a) Pursuant to authority of P.L. 1995, c.266 (N.J.S.A. 52:27D-25) the Commissioner hereby adopts the model standard of the National Fire Protection Association, known as "NFPA 1561/Standard on Fire Department Incident Management System/1995." This standard is hereby adopted by reference as the New Jersey Incident Management System, subject to the modifications set forth in N.J.A.C. 5:75-2.2.

(b) Copies of this standard may be obtained from the sponsor at: National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

(c) When used alone, the terms "subchapter," "section," and so forth, refer to that portion of these rules. When used in N.J.A.C. 5:75-2.2, the terms "section," "subchapter" or "chapter," and so forth, refer to the NFPA Standard.

N.J.A.C. 5:75-2.2 Modifications

(a) The following sections of NFPA 1561, 1995 ed., are modified as follows:

1. Section 1-1.1 is amended to replace the term "fire departments" with "the fire service."
2. Section 1-1.2 is amended to delete the terms "military and private" and "fire brigades."
3. Section 1-1.2.2 is amended to delete the second sentence in its entirety.
4. Section 1-3 "Definitions" is amended to delete the following terms:
 - i. "Emergency incident."
 - ii. "Fire department," and
 - iii. "Member."
5. Section 2-5.2 is amended as follows:
 - i. The term "fire department" is deleted and the term "Regulations for Fire Service Incident Management System" is substituted in lieu thereof.
 - ii. The term "and experience" is deleted.

6. Section 2-6 is deleted in its entirety.

7. Chapter 5 "Referenced Publications" is deleted in its entirety.

N.J.A.C. 5:75-2.3 Geographical identification of the incident scene

(a) To provide for uniform identification of locations and operational forces within an incident scene, the scene shall be divided geographically into smaller parts which shall be designated as divisions. Specific areas of the incident scene shall be designated as follows:

1. Sides of incident scenes designated as divisions shall be further identified by the addition of a letter of the alphabet beginning with the letter "A."

i. The side of the incident scene that bears the postal address of the location shall be designated as division "A" by the incident commander. Where the incident scene has no postal address, the incident commander shall select any side to designate division "A".

ii. Continuing in a clockwise rotation, the side adjacent to the division "A" side shall be designated as division "B."

iii. Continuing in a clockwise rotation, the side adjacent to the division "B" side shall be designated as division "C."

iv. Continuing in a clockwise rotation, the side adjacent to the division "C" side shall be designated as division "D."

2. When operating at an incident containing more than one level, each level shall be designated as a division and shall be further identified by the addition of an Arabic numeral beginning with the number "1."

i. The ground level of the incident scene shall be designated as division "1."

ii. The next level above the ground level shall be designated as division "2."

iii. Subsequent levels above division "2" shall be assigned division numbers in progressing order in this manner.

3. Additional areas of the incident scene shall be designated through the use of terms common to the fire department including, but not limited to, basement, roof, interior, etc.

MODEL SOP FOR THE PERSONNEL ACCOUNTABILITY SYSTEM

PURPOSE:

This procedure is designed to establish a means to track and locate all fire department members operating at any incident or activity in which this company becomes involved.

SCOPE:

All department personnel.

RESPONSIBILITY:

All department personnel and officers.

SAFETY:

It is the intention of this department to provide the optimal level of firefighter safety. The application of this procedure will assist all members to meet this goal.

DEFINITIONS:

Hazardous Area – means any location(s) that may pose a safety and/or health risk to firefighters due to, but not limited to, the presence of products of combustion, hazardous or otherwise oxygen deficient or oxygen enriched atmosphere or the potential for any IDLH atmosphere, hazardous equipment or operations or the potential for any of these situations to exist. Additionally, any area or location that predisposes a firefighter to become lost, disoriented or trapped, including any confined space and wild land areas shall be considered a hazardous area for the purpose of this section.

IDLH – means immediately dangerous to life and health

PAS – personnel accountability system

PAT – personnel accountability tag

Personnel Accountability Officer – means the person designated by the Incident Commander to monitor entry into and exit out of hazardous areas and/or structures for the purpose of ensuring accountability of all personnel in the hazardous area or structure.

Personnel Accountability Report/Roll Call – means the results of an accounting of all personnel on the emergency incident scene to the Incident Commander

PROCEDURE:

This procedure applies to all members of this department when operating at the site of any/all emergency responses.

1. Every member of this department will be issued two (2) Personnel Accountability Tags (PAT). The tags will be affixed to the front of their turnout coat.
2. Each member, upon arrival at an incident scene, shall surrender the primary personnel accountability tag to a central collection point as designated by the Incident Commander (this may also be the apparatus the firefighter is assigned to or arrived on).
3. Each member, upon entry to a hazardous area or structure, shall surrender the secondary PAT to the

Personnel Accountability Officer as appointed by the Incident Commander. Upon leaving the hazardous area or structure, the member shall immediately retrieve his/her PAT from the Personnel Accountability Officer and re-attach it to the front of his/her turnout coat.

4. A key element of personnel accountability is crew integrity. It will be the responsibility of all members and officers to ensure that crew integrity is maintained. Simply stated, all crews must enter together, stay together and come out together.
5. All crews entering a hazardous area or structure should exit at the same point where entry was made. If hazardous conditions dictate that crews must exit the area or structure by a different route than where entry was made, the crew must immediately report to the Personnel Accountability Officer at the original entry point and retrieve their PATs.
6. When multiple points of entry are used at a hazardous area or a structure, a Personnel Accountability Officer shall be appointed for each entry point.
7. It will be the responsibility of the company officer or Personnel Accountability Officer to ensure that:
At least two (2) members be assigned to each crew or task.
The location and function of each crew be communicated to the Incident Commander or designee.
8. If the need arises to evacuate a hazardous area or structure and an evacuation is ordered, the personnel accountability officer shall order an immediate roll call of all members operating at the incident to be conducted as soon as they exit the hazardous area. The personnel accountability officer shall assure that every member who has surrendered his/her accountability tag retrieves it and re-attaches it to their protective gear.
9. If after a reasonable time crews have not retrieved their personnel accountability tags or conditions indicate that the area is immediately unsafe for crews and/or the personnel accountability officer to operate in safely, the personnel accountability officer shall immediately report to the Incident Commander and inform him/her that members are unaccounted for and that the need for search and rescue might exist. If the personnel accountability officer is not holding any personnel accountability tags after an evacuation is ordered, he/she shall report to the Incident Commander that all members are accounted for.
10. Immediately upon receiving a report of a member or members unaccounted for, the Incident Commander shall reassign all resources necessary to locate unaccounted for members.
11. On large or complex incidents, it becomes critical that all crews and companies operating be tracked. Any time a crew or company's assignment, location, or status changes, the change must be immediately communicated to the Incident Commander. It will be the responsibility of the company officer to report the status of their crew or company at all times.
12. The Incident Commander will call for a Personnel Accountability Report:
 - If there is a report of a firefighter down or missing.
 - When an emergency evacuation is ordered.
 - When the incident is declared under control.
 - When changing attack modes (i.e. offensive to defensive).
 - Anytime the Incident Commander feels it necessary to conduct a PAR.
13. When it is announced that a PAR is to be conducted all companies will:
 - Conduct a role call of the members in that company to ensure all members are accounted for.
 - Cease all but emergency radio communications.
 - Report all members accounted for or report members missing.
14. If a member should lose their primary PAT, they must immediately report this to a company officer or the Incident Commander.
15. Members without PATs shall not be permitted inside hazardous areas or structures.

**APPENDIX
VI**

**PUBLIC EMPLOYER'S GUIDE
AND MODEL WRITTEN
PROGRAM FOR THE HAZARD
COMMUNICATION STANDARD**

About The Guide

The *Public Employer's Guide and Model Written Program for the Hazard Communication Standard* was developed by the New Jersey Department of Health and Senior Services, Public Employees Occupational Safety and Health (PEOSH) Program, Education and Training Project. This Guide is designed to help employers and employees understand the requirements of the PEOSH Hazard Communication Standard (HCS), N.J.A.C. 12:100-7. An overview of the major components of the PEOSH HCS and explanations of how components of the New Jersey Worker and Community Right to Know Act interact with the PEOSH HCS are provided. Included at the end of this document is a copy of the PEOSH HCS, an HCS compliance checklist, and a sample letter for requesting material safety data sheets to further assist employers with the requirements of the Standard.

A *sample written hazard communication program* is provided to illustrate how to develop a written program. The format and content of the sample written program must be modified to reflect the actual activity and policies of each individual workplace in order to make it an effective management tool for protecting the health and safety of employees. Every workplace that uses hazardous substances must have a written program and is required to implement an effective hazard communication program.

This guide and additional occupational safety and health bulletins and model programs may be accessed through the New Jersey Department of Health and Senior Services and New Jersey Department of Labor's Web sites identified on the "*Resources for Additional Information*" list found on page 22 of the guide.

July 2004

Introduction

The federal Occupational Safety and Health Administration (OSHA) estimates that there are approximately 32 million workers who are exposed to or have the potential for being exposed to one or more chemical hazards in the workplace. The number of exposed or potentially exposed individuals, the rate at which chemicals are being introduced yearly, plus the over 600,000 chemicals that already exist support the need for workers to be informed about the chemical hazards they may encounter in the workplace (OSHA Fact Sheet 93-26).

To protect the health and safety of workers, the federal Hazard Communication Standard, Title 29 of the Code of Federal Regulations (CFR), Part 1910.1200, was adopted by OSHA in 1983. The Hazard Communication Standard requires private employers to inform their employees of the hazards and identities of workplace chemicals to which they may be exposed. Public sector workers were not covered by the Hazard Communication Standard; however, New Jersey had adopted a law the same year which provided similar occupational health and safety protection for public sector workers, the New Jersey Worker and Community Right to Know (RTK) Act.

To increase the ability of New Jersey to protect its public sector workforce, on January 11, 2001, OSHA approved New Jersey as a State-Plan state for public employees only. In accordance with the OSHA-approved PEOSH State Plan, New Jersey must provide an occupational safety and health program that is or will be as effective as the federal program. Through the Public Employees Occupational Safety and Health Act, New Jersey adopted the Hazard Communication Standard with amendments, N.J.A.C. 12:100-7, to bring New Jersey's regulatory requirements and standards in line with OSHA requirements. The PEOSH Hazard Communication Standard (HCS), and a summary of the amendments to the federal Standard which resulted in the creation of the PEOSH HCS, are included in Appendix A and Appendix B, respectively.

The PEOSH HCS overlaps with the New Jersey Worker and the Community Right to Know Act (RTK Act) administered by the Department of Health and Senior Services Right to Know Program in the area of education and training of public employees. In order to prevent confusion and public employers from being subjected to two sets of rules regarding education and training, certain provisions of RTK education and training have been added to the PEOSH HCS and education and training is being removed from the RTK rules. **Since public employers have been complying with the Worker and Community Right to Know Act since 1984, most public employers will have already complied with many of the requirements of the PEOSH HCS.**

The PEOSH HCS requires employers that "use" (handle, package, transfer or react to) hazardous chemicals to establish a written hazard communication program and communicate the hazard information to workers through labels and other forms of warnings, Material Safety Data Sheets, Hazardous Substance Fact Sheets, and worker information and training programs. This Guide has been developed to assist public employers in complying with the PEOSH HCS and making the transition from RTK training to PEOSH HCS-required training.

PEOSH Hazard Communication Standard Requirements

The PEOSH HCS is based on the concept that employees have both the right and the need to know about the hazards they are exposed to while working and the identities of the chemicals that pose the hazard. It puts in place a system whereby the hazards of all chemicals are evaluated. The hazard information and protective measures required to use these chemicals safely are then communicated to employers and their exposed or potentially exposed employees who may use the chemicals. The responsibility for communicating chemical hazards may be grouped as follows:

- Producers (manufacturers) and importers of chemicals have the responsibility for determining the hazards of each chemical and providing the hazard information to the users of the products containing the hazardous chemical;
- Employers who use hazardous chemicals are responsible for obtaining and maintaining hazard information on the products they use, and ensuring that their employees who work with the hazardous products are aware of the hazards.

Employers that do not produce or import but only use hazardous chemicals can focus on those parts of the Standard that require the establishment of a workplace hazard communication program and the communication of the hazard information to their workers. The PEOSH HCS is performance-based; therefore, employers are allowed flexibility in adapting their existing health and safety documents or procedures to meet the requirements of the Standard for their workplace. This Guide will indicate, where appropriate, when existing requirements of the RTK Act can be used to fulfill similar requirements of the PEOSH HCS.

The compliance strategy regarding the PEOSH Hazard Communication Standard outlined in this document serves as a general guide for employers. It is the employer's responsibility to review the PEOSH HCS in Appendix A to become completely familiar with its requirements.

Scope and Application

The PEOSH HCS applies to all public employers, regardless of size, whose employees may be exposed or have the potential for exposure to hazardous chemicals under normal conditions of use or in a foreseeable emergency in the workplace.

Employers with Limited PEOSH HCS Coverage

1. **Chemicals in sealed containers** – Employees who handle hazardous chemicals in sealed containers which are not opened under normal conditions of use, such as in warehouses and transportation facilities, are exempt from the full requirement of the Standard but are still required to:

- Ensure that labels are not defaced or removed from incoming containers;
- Obtain and maintain Material Safety Data Sheets (MSDSs) and make them readily accessible to employees in their work areas during each workshift; and
- Provide information and training for employees, except for the location and availability of the written hazard communication program, so they know how to protect themselves in the event of a chemical spill or leak from a sealed container.

2. **Laboratories** – Employers are required to perform only the following under the PEOSH HCS:

- Ensure that labels are not defaced or removed from incoming containers;
- Obtain and maintain Material Safety Data Sheets (MSDSs) and make them readily accessible to employees in their work areas during each workshift; and
- Provide information and training for laboratory employees in accordance with the PEOSH HCS, except for the location and availability of the written hazard communication program.

The PEOSH Occupational Exposure to Hazardous Chemicals in Laboratories Standard, 29 CFR 1910.1450, applies to employers who are engaged in the laboratory use of hazardous chemicals. Laboratory use of hazardous chemicals means handling or use of such chemicals in which all of the following conditions are met: chemical manipulations are carried out on a “laboratory scale;” multiple chemical procedures or chemicals are used; the procedures involved are not part of a production process; and protective laboratory practices and equipment are available and in common use. See details in Appendix H. This Standard requires employers to provide employees with information and training to apprise them of the hazards of chemicals present in their work area. For laboratories covered under the Laboratory Standard, the requirements of the PEOSH HCS are superseded. In this case the more specific Standard, 29 CFR 1910.1450, applies. However, these laboratories are still required to comply with the provisions of the RTK Act.

Laboratory employers that ship hazardous chemicals are considered to be either chemical manufacturers or distributors. They must, therefore, ensure that any containers of hazardous substances leaving the laboratory are labeled as required by the PEOSH HCS, and that an MSDS is provided to distributors and other employers in accordance with N.J.A.C. 12:100-7.7(f) and (g).

How to Comply with the PEOSH Hazard Communication Standard

➤ Read the Standard, N.J.A.C. 12:100-7

Make sure you understand what is required of you by the Standard. Public employers should focus specifically on the following sections of N.J.A.C. 12:100-7:

- (7.5) written hazard communication program
- (7.6) labels and other forms of warnings
- (7.7) material safety data sheets, and
- (7.8) information and training

Additionally, you should read Appendix E of the PEOSH HCS which provides guidelines for employer compliance as well as the bulletin “PEOSH Adopts the Hazard Communication Standard” developed by the PEOSH Program. This bulletin explains the general requirements of the Standard and highlights the amendments to the PEOSH Hazard Communication Standard that incorporate certain provisions of the New Jersey Worker and Community Right to Know Act.

➤ Identify Responsible Staff

Identify staff who will be responsible for the initial set up of the hazard communication program and the day-to-day activities necessary to comply with the PEOSH HCS.

➤ Develop and Implement a Written Hazard Communication Program

The PEOSH Hazard Communication Standard requires public employers, in workplaces where employees are exposed or have the potential for exposure to hazardous chemicals under normal conditions of use or in a foreseeable emergency in the workplace, to have a written hazard communication program describing how the requirements in the Standard will be put in place in that facility. The written program must be made available upon request to employees, their designated representatives, the Commissioner of Labor and/or the Commissioner of Health and Senior Services and the Director, in a reasonable time, but no later than 15 days from the time of the request in accordance with the Access to Employee Exposure and Medical Records Standard, 29 CFR 1910.1020(e). The only exceptions to the written plan requirements are laboratories and workplaces where employees handle chemicals in sealed containers only, e.g., warehouses. Refer to Section 7.2 of the Standard for the specific requirements for these two types of workplaces.

The written hazard communication program must contain a list of hazardous chemicals and must detail how the employer will comply with the requirements for labeling and other forms of warning, obtaining and maintaining MSDSs, and providing information and training to employees. The written program does not have to be lengthy or complicated, but it must explain completely how the PEOSH HCS is being put into practice at your specific workplace. The written program must include, at a minimum:

- A. The person responsible for developing, evaluating the effectiveness of, and updating the written program;
- B. The person responsible for each aspect of the hazard communication program (labeling, MSDSs, training). Names or titles must be indicated in the written program;
- C. A description of the system(s) used for container labeling and any warning methods used in the event of a chemical release or overexposure to a hazardous chemical that is in use in the workplace;
- D. The person responsible for obtaining and maintaining MSDSs, if different from the individual taking care of the written program, and the procedures employees use to gain access to the MSDSs. If the MSDSs are electronically available, the backup method for accessing MSDSs must be described;

- E. An explanation of the procedures used to train new employees at the time of their initial assignment and when a new hazard is introduced in the workplace, as well as the procedure for refresher training every 2 years;
- F. The means used to inform employees of the location of the written program and how and when the written program will be made available to employees;
- G. A description of the methods used for communicating hazards to others, such as subcontractors, and what protective measures are necessary for the subcontractor's employees. Details about how employees will be protected from hazardous substances brought into the workplace by the subcontractor must also be described;
- H. The methods the employer will use to inform employees of the hazards of non-routine tasks; and
- I. A description of how the employer will provide employers at multi-employer workplaces with on-site access to MSDSs and an explanation of the labeling system used at the site, and precautionary measures that are needed during normal operations and in foreseeable emergencies.

A sample written hazard communication program has been included in this Guide to aid you in developing your program. **If you choose to use this sample program as a guide, be sure to adapt it to reflect the hazards, protective measures, and policies and procedures specific to your workplace.** For additional guidance on how to develop a written hazard communication program, refer to Appendix E, Guidelines for Employer Compliance (Advisory), found at the end of the Standard, N.J.A.C. 12:100-7. A copy of the Standard is located in Appendix A of this document.

➤ Identify Hazardous Chemicals

It is the responsibility of the manufacturer/producer or importer of chemicals to identify whether a chemical is hazardous. **As a user of chemicals** you rely on the evaluation received from the manufacturer or importer through labels on containers and Material Safety Data Sheets (MSDSs). In general, if the chemical or product has been shown to cause an acute or chronic health effect, or pose a physical hazard such as flammability or corrosivity, it is considered to be hazardous.

Public employers can also use the Right to Know Hazardous Substance List to assist in identifying whether a chemical is hazardous. Under the hazard communication program, if there is a question regarding the hazard of a particular chemical, it is best to include that chemical on the list.

➤ Make a List of the Hazardous Chemicals in Your Workplace

The PEOSH HCS requires a list of hazardous chemicals in the workplace to be prepared and become a part of the written hazard communication program. **All hazardous chemicals present in your workplace should be placed on a list using the identity of the hazardous chemical that appears on the appropriate MSDS and label.** The list may be compiled for the entire workplace as a whole or by individual work areas, and should contain all known hazardous chemicals in the facility. Develop the list by identifying hazardous chemicals in containers and, if applicable, in pipes and work operations such as the fumes produced from welding. The list can also serve as an inventory of every hazardous product for which an MSDS and Hazardous Substance Fact Sheet (HSFS) must be maintained. A worksheet for developing a list of hazardous chemicals can be found in Appendix C. Although the location and availability of MSDSs and HSFSs are not required on the list, it can help track receipt of MSDSs and HSFSs and identify the work area in which the MSDS should be located. It can also serve as an alternative to keeping MSDSs for 30 years. Under the Access to Employee Exposure and Medical Records Standard, 29 CFR 1910.1020, MSDSs are specifically identified as exposure records and are therefore required to be kept at least 30 years except as indicated in 29 CFR 1910.1020(d)(1)(ii)(B)-see Appendix G.

Many public employers already have a list of hazardous chemicals on hand, their Right to Know (RTK) Survey. Since the PEOSH HCS is performance-based, you are allowed to use your complete inventory RTK Survey as the required list. If public employers want to use their RTK Survey, they must make certain that the survey contains **all** of the hazardous chemicals in the workplace, not just those listed on the RTK Hazardous Substance List. If you have chemicals that are covered by the PEOSH HCS but are not required to be reported on the RTK Survey, you can list them on the worksheet in Appendix C and attach it to the RTK Survey, or include them on the RTK Survey.

Before finalizing your list, review your worksheet to see if any chemical may be exempt from being placed on the finalized list. If it is not hazardous, it is not covered. If there is no potential for exposure, the chemical cannot be released, it is not covered. Review N.J.A.C. 12:100-7.2(f) to determine exemption of chemicals. Once you have developed your list of hazardous chemicals or are using a RTK Survey that lists all products containing hazardous chemicals used in the workplace, **develop procedures to keep your list current.** Remember to add hazardous chemicals in new products to the list as they are introduced in the workplace. If you are using the RTK Survey as the list, attach a supplemental page listing the new hazardous chemicals until your next RTK Survey is due, at which time the new chemicals can become part of your RTK Survey. The following is a list of some potentially hazardous chemicals and products typically present in a workplace:

Acetone	Etching Agents	Paints
Acids	Fiberglass	Pesticides
Adhesives	Flammables	Process Chemicals
Aerosols	Foaming Resins	Sealers
Antifreeze	Fuels	Shellacs
Asbestos	Fungicides	Solders
Battery fluids	Gasoline	Solvents
Benzene	Glues	Strippers
Catalysts	Greases	Surfactants
Caustics	Inks	Thinners
Cleaning Agents	Insecticides	Varnishes
Coal Tar Pitch	Herbicides	Water Treatment Chemicals
Coatings	Janitorial Supplies	Wood Preservatives
Degreasing Agents	Kerosene	Xylene
Detergents	Lacquers	
Diesel Fuel	Lubricants	
Disinfectants	Lye	

➤ Obtain Material Safety Data Sheets (MSDSs) and Hazardous Substance Fact Sheets (HSFSs)

Employers must have an MSDS and HSFS (written for individual chemicals) for each hazardous product or chemical they use. Distributors are responsible for ensuring their customers are provided a copy of the MSDS. While employers will have copies of the MSDSs in their RTK Central File, **they must make sure that copies of the MSDSs for hazardous chemicals are readily accessible to employees while they are in their respective work areas in order to meet the requirements of the PEOSH HCS.**

1. If you do not have an MSDS for a hazardous substance in your workplace, request a copy from the manufacturer or distributor as soon as possible. A sample letter requesting an MSDS is included in Appendix D. MSDSs are required to be included in the initial shipment to you of materials containing hazardous chemicals and with the first shipment after an MSDS is updated, or must precede the shipment (e.g., with invoices).
2. Review each MSDS received to be sure it is complete, clearly written, and the most up to date copy. The MSDS should contain no blank spaces; where information is not available a notation to that affect must be indicated on the MSDS. The identity of the chemical or product used on the label is required to be on MSDS.

3. If the MSDS is incomplete or the copy is unclear, contact the manufacturer for the missing information or to request another copy.
4. If you do not have an HSFs for a hazardous substance in your workplace, request a copy from the RTK Program or download a copy from the program's website. The mailing and website addresses are listed on the Resources for Additional Information page.
5. Make sure the MSDSs and HSFs are available to employees, designated representatives, and the Commissioners of the New Jersey Departments of Labor or Health and Senior Services, or their designees.
6. If MSDSs and HSFs are available to employees electronically, make sure that the employees have been instructed on how to access the MSDSs and HSFs, and have a backup system in place in case of system failure.

The RTK law requires public employers to have MSDSs and HSFs in their RTK Central File, so employers may have the MSDSs and HSFs already on hand. However, you will need to make certain the MSDSs are readily accessible during each work shift when the employee is in their work area as required by the PEOSH HCS. If the RTK Central File provides the required accessibility for employees, it meets the PEOSH HCS requirement.

➤ **Make Sure All Containers Are Labeled**

The PEOSH HCS-required label must contain the identity of the product and appropriate hazard warnings. The **identity** is any term that appears on both the label and MSDS linking these two sources of information. It may be a common or trade name such as "Desk and Office Cleaner." A **hazard warning** is any statement, picture, or symbol used to convey the hazardous effects of the material. The label must be legible and prominently displayed. There are no specific requirements for the size, color, or wording of the label. A sample PEOSH HCS label is shown below:

Sample PEOSH HCS Label	
Product Identity	Desk and Office Cleaner
Hazard Warning	Caution: Avoid eye contact; may be irritating to the eyes. Contents under pressure; store in cool, dry place.
Manufacturer	XYZ Office Supply Company 222 Middle Lane Westberry, AB 11111 (000) 121-3456

The manufacturer, importer or distributor is responsible for labeling containers. Public employers are responsible for the following:

1. Ensure that all containers in the workplace are labeled, tagged, or marked with the identity of the product, hazard warnings, and the manufacturer's name and address, and that upon entering the workplace the label is not defaced or removed from the product. A detailed discussion of PEOSH HCS labeling requirements is found in N.J.A.C. 12:100-7.6;
2. If the container is not labeled or the label is damaged, obtain a label from the manufacturer, importer or other responsible party, or request the label information and prepare a label using the information obtained from these sources;
3. Ensure that any packaged material that is required to be marked, labeled or placarded by the U.S. Department of Transportation's Hazardous Materials Regulations (49 CFR Parts 171 through 180), retains the marking, label or placard until the packaging is removed or the container is sufficiently cleaned of residue or purged of vapors to remove any potential hazard;

4. Instruct employees to label portable containers into which they have poured hazardous substances. If the portable container is for the individual's immediate use during his/her shift, then the container does not need to have a PEOSH HCS label, however, some identification as to what is in the container is advisable.

Public employers are required to ensure that products containing hazardous chemicals are labeled according to both the PEOSH HCS and the RTK Act. Many manufacturers have already labeled their products according to both the PEOSH HCS and RTK Act, so product labels should be checked for compliance before attempting to re-label. The **PEOSH HCS label** contains at a minimum the identity of the product or chemical, appropriate hazard warnings, and the name and address of the manufacturer or importer. Containers received should already bear the required PEOSH HCS label. The **RTK label** must include the top five ingredients of the product, whether hazardous or not, and any other hazardous chemicals in the product that are not included in the top five ingredients, plus the Chemical Abstracts Service number of the ingredients listed on the label. Contact the RTK Program for additional information about labeling requirements.

➤ Train Employees

All employees who are exposed or have the potential for exposure to hazardous chemicals while working must be provided with information and training about those hazards. "Exposed employee" means an employee who comes into contact with a hazardous chemical through any route of entry such as inhalation, ingestion, skin absorption, etc., during the course of his or her routine work or in emergency situations. This training must be provided upon assignment to work with the hazardous material, when new hazards are introduced into the workplace for which the employee has not already been trained, and every two years thereafter if the worker continues to be exposed to hazardous chemicals.

The time frame for providing initial training under the PEOSH HCS is unlike the initial training requirement under the RTK law in that the employee must be trained before working with the hazardous chemical. Employers do not have a 30-day time frame in which to conduct the initial training.

PEOSH HCS training must be provided by a technically qualified person, on paid time, and in a manner consistent with the educational level, literacy, and language of the employee being trained. Training records must be maintained for the duration of the employee's employment. The information contained on the sample Sign-In sheet in Appendix F, the qualifications of the trainer, and summary information regarding the training program must be kept as documentation of the PEOSH HCS training.

The following are recommendations for training in order to ensure consistency and promote effectiveness:

- A. Designate a person or persons to be responsible for the initial and refresher training, and any special training that may be needed.
- B. Incorporate visual as well as auditory elements in the training and use hands-on activities where appropriate. **Videotapes may be used to supplement your training, but their use alone is not acceptable as PEOSH HCS training.**
- C. Make sure you include all of the required components of training listed in N.J.A.C. 12:100-7.8:
 1. An explanation of the PEOSH Hazard Communication Standard and the facility's written program;
 2. The person responsible for maintaining the written program;
 3. A description of the operations where hazardous chemicals are present;
 4. The location of the written program and availability of other health and safety information (MSDSs, RTK Survey, HSFs, and RTK Hazardous Substance List);
 5. Information on how to use the list of hazardous chemicals (or RTK Survey) and how to obtain, read and use MSDSs, labels and HSFs;

6. Methods to identify and recognize hazardous chemicals in the work area (labels, MSDSs, and HSFSSs);
 7. A discussion of the physical and health hazards of the hazardous chemicals;
 8. Control measures and specific procedures used to prevent exposure;
 9. Methods and observations used to detect the presence or release of a hazardous chemical in the work area;
 10. Standard operating procedures regarding the use, storage, and emergency clean-up of the hazardous chemicals;
 11. An explanation of the applicable provisions of the RTK Act (RTK Survey, HSFSS, RTK labeling, RTK poster, RTK Central File, and RTK Hazardous Substance List); and
 12. Hand out a copy of the RTK brochure.
- D. If there are only a few chemicals in the workplace, you may want to discuss each one individually using MSDSs and HSFSSs for that portion of the information and training program where the actual chemical hazards are discussed. Where there are large numbers of chemicals used, or where chemicals change frequently, training by hazard groups such as flammables, corrosives, poisons, etc., may be more appropriate.
- E. Keep accurate training records. Retain the required documentation of each training session. Accurate recordkeeping will help the trainer identify topics and materials for refresher training.

Public employers may already be providing a significant portion of the required PEOSH HCS training in their RTK education and training program. You will have to modify your RTK training program outline and curriculum to incorporate those components identified in section 7.8 of the PEOSH HCS that are not a part of your current training program. Specifically you will need to include, a description of the written hazard communication program and its location, an explanation of the PEOSH Hazard Communication Standard, labeling requirements, and any other component of PEOSH HCS-required training not included in your RTK training program. **The PEOSH HCS training will substitute for RTK training. You do not have to provide a separate RTK training program.**

➤ TRADE SECRETS

The PEOSH HCS allows chemical manufacturers, importers, or employers to withhold the specific chemical identity of a hazardous chemical from an MSDS if certain conditions are met:

1. The trade secret claim can be supported;
2. The MSDS contains information on the properties and effects of the hazardous chemical;
3. The MSDS indicates that the specific chemical identity is being withheld as a trade secret; and
4. The specific chemical identity is made available to health professionals, employees, and designated representatives under certain specific situations.

In general, a request for the disclosure of a trade secret must be in writing and a statement to maintain the confidentiality of the disclosed information must be included in the request. Review the PEOSH HCS for more specific details regarding the trade secret provision. Appendix D of the Standard provides more information about trade secrets.

SAMPLE

Written

Hazard

Communication

Program

(Name of Employer)

Written Hazard Communication Program

Policy and Administration

This notice is to inform you that our agency complies with the Public Employees Occupational Safety and Health Program Hazard Communication Standard (PEOSH HCS), N.J.A.C. 12:100-7, which New Jersey adopted with amendments, on May 3, 2004. We provide information about the hazardous chemicals in our workplace, their associated hazards, and the methods for controlling these hazards. We have put in place the following required elements of the Standard:

- (1) A list of hazardous chemicals;
- (2) Material Safety Data Sheets (MSDSs) and Hazardous Substance Fact Sheets (HSFSs) for hazardous chemicals;
- (3) Labeled containers; and
- (4) A training program for employees who work with or have a potential for exposure to hazardous chemicals.

This written program applies to all work operations in our facility where employees are exposed or may be exposed to hazardous chemicals or conditions under normal working operations or during foreseeable emergency situations.

_____(name)_____, located in room _____, is the program coordinator who has overall responsibility for the written program and responsibility for the annual review and update of the written program. _____(name)_____ also makes available the written program to employees upon their request within three days of the request.

As required under the PEOSH HCS, employees will be informed of the contents of this program, the location and availability of health and safety information about hazardous chemicals, the hazardous properties of chemicals with which they work, safe handling procedures for the hazardous chemicals, and measures they should take to protect themselves from the hazardous chemicals. This information will be provided during employee training sessions and/or safety meetings. Employees will also be informed of the hazards of non-routine tasks such as _____.

List of Hazardous Chemicals

The list of the hazardous chemicals in this facility is prepared by _____(name)_____. The list is continually updated and is included at the back of this program. Although not required by the PEOSH HCS, a separate list is available for each work area.

[Note to employer: If you are using your RTK Survey as the list it must be stated in the written program, and the process for updating the RTK Survey when new hazardous chemicals are brought into the workplace must be explained.]

Material Safety Data Sheets (MSDS) and Hazardous Substance Fact Sheets (HSFS)

MSDSs and HSFSs provide health and safety information on the specific hazardous products or chemicals employees use. In compliance with the PEOSH HCS, the MSDSs are made readily accessible during each work shift to employees when they are in their work area. _____(name)_____, _____(person's title), obtains MSDSs on all products containing hazardous chemicals and HSFSs on all hazardous chemicals, places copies of the MSDSs in a binder in each work area of this facility, and maintains a master file of all the

MSDSs and HSFs in his/her office. If additional information is needed about a hazardous chemical or product, if an MSDS is missing, or if an MSDS has not been supplied with the initial shipment, (name) will contact the manufacturer or supplier. The people listed below will ensure that the MSDSs kept in each work area are updated as needed and the MSDS binder is kept intact, and that HSFs are updated as needed. As a policy of this facility, an MSDS and HSFs hard copy will be provided to the requesting employee immediately upon request, or within 3 working days of the request if the MSDS or HSFs is not immediately available.

<i>Name</i>	<i>Work Area</i>
_____	_____
_____	_____
_____	_____
_____	_____

Any new procedures or products that are planned to be used in this workplace must be approved by (name) before use to make sure that MSDSs and HSFs are obtained before use.

[Note to Employer: If MSDSs and HSFs are being made available electronically; you must include details on how the MSDSs and HSFs can be accessed by employees, the location of the electronic system, who will provide training on the system, and when the training will be held. The location of the backup MSDS and HSFs file must also be indicated.]

Labels and Warning Systems

 (name) ensures that each container of hazardous chemicals in this workplace is properly labeled as required by the PEOSH HCS, and updates the labels as necessary if they should become illegible, fall off the container, or are obscured in any manner. Containers not bearing a PEOSH HCS label are not accepted by our facility.

- ◆ Stationary containers in an area with similar contents and hazards have signs posted on or above them to convey the hazard information.
- ◆ Employees transferring hazardous materials from a labeled container to a portable container intended only for their immediate use during the work shift, do not have to label the portable container. If the portable container is stored beyond the employee's shift, or will be used by other workers, the employee labels the portable container with the PEOSH HCS information from the properly labeled larger container.

[Note to Employer: If you have an additional labeling system in use such as National Fire Protection Association (NFPA) labels, this system should be explained in this section. If you should ship containers, an explanation of who will label the containers to be shipped and how the label will be affixed to the container should be discussed. Pipes or piping systems do not have to be labeled with PEOSH HCS labels, but the hazards of the materials contained in the pipes must be discussed during the PEOSH HCS training sessions.]

Hazardous Non-Routine Tasks

Periodically, our employees are required to perform hazardous non-routine tasks such as:

When employees are required to perform the above hazardous non-routine tasks, a special training session is conducted to inform them about the hazardous chemicals to which they might be exposed and the proper precautions to take to reduce or avoid exposure. This special session is conducted by _____ (name) _____ prior to employees beginning the task. Employees who perform these non-routine tasks are notified about the training by their supervisor, and are required to attend the training.

Employee Training

Every employee who works with or has the potential for exposure to hazardous chemicals under normal conditions of use or in foreseeable emergencies will receive initial and refresher training under the PEOSH Hazard Communication Standard on the safe use of those hazardous chemicals. _____ (name) _____, in room _____, is responsible for providing the training. A training program that uses both audiovisual materials and classroom instruction has been prepared for this purpose.

[Note to Employer: An explanation of the training methodology used at your worksite must be specified in this area. OSHA has developed a sample hazard communication training program that may assistance you with the development of your training program. OSHA's website is listed on the "Resources for Additional Information" page.]

- ◆ The trainer meets the definition of a technically qualified person.
- ◆ Whenever a new hazard is introduced into the work area, an **additional training session** is provided for workers in a scheduled safety meeting conducted by _____ (name) _____ prior to beginning work with the new hazardous material. Supervisors notify employees about the safety meetings.
- ◆ **Refresher training**, an abbreviated version of initial training, is conducted every two years. Area supervisors notify employees when the training session is scheduled, and a notice is placed on the bulletin board inside the break room.
- ◆ **Attendance is mandatory at all training sessions** for those workers identified as exposed or having the potential for exposure to hazardous chemicals under normal conditions of use or in foreseeable emergencies.
- ◆ Training is provided at no cost to the employee and is provided during working hours. The training is appropriate in content and vocabulary to the educational level, literacy and language of the employees.
- ◆ The documentation of training required by PEOSH HCS is maintained in _____ (location) _____.

As a policy of this facility, foremen and supervisors receive supplemental training from selected manufacturers' representatives when specialty equipment is purchased and when non-routine hazards arise due to a new operation. They then can answer employee questions and provide daily monitoring of safe work practices.

The **initial training session** includes the following discussion items:

1. An explanation of the PEOSH Hazard Communication Standard and this written program;

2. Chemical and physical properties of the hazardous materials (e.g., flash point, reactivity) and methods used in this workplace to detect the presence or release of hazardous chemicals (including the chemicals in piping systems);
3. Physical hazards of chemicals such as the potential for fire and explosion;
4. Health hazards (both acute and chronic) associated with exposure to hazardous chemicals, signs and symptoms of exposure, and any medical condition that may be aggravated by exposure to the chemical, using MSDSs and HSFSSs;
5. Methods to protect against exposure to the hazard such as engineering and administrative controls, proper work practices, use of personnel protective equipment (PPE), and procedures for emergency response to spills and leaks;
6. Standard operating procedures to assure protection when cleaning hazardous chemical spills and leaks;
7. The location of and responsible person for maintaining MSDSs, HSFSSs, RTK Survey, RTK Hazardous Substance List (HSL), and other hazardous material information;
8. An explanation of the applicable provisions of the Worker and Community Right To Know Act;
9. How to read and interpret the information on PEOSH HCS and RTK labels, HSFSSs and MSDSs, and how employees may obtain additional hazard information using the RTK Survey and RTK HSL;
10. A copy of the RTK brochure is handed out during training.

[Note to Employer: If electronic MSDS and HSFSS systems are used, include in the training an explanation of how employees can access the system and what to do if a backup MSDS and HSFSS system is required. The hazards of the chemicals reviewed, using MSDSs and HSFSSs, should reflect the actual hazardous chemicals used at your workplace.]

The initial and refresher training programs for employees are reviewed annually by the trainer, who will notify area supervisors of the training needs of their employees. As part of the assessment of the training program, input from employees regarding the training they have received and suggestions for improving the training are obtained through training evaluation forms. In addition, suggestions may be placed in the employees' suggestion-box.

Employee **refresher training** is an abbreviated version of the initial training, and includes a discussion of the following information:

1. An explanation of any changes in the written program, PEOSH HCS, or RTK Act.
2. Changes in products used or work processes that may cause exposure to hazardous chemicals.
3. A review of health hazards, chemical and physical properties of the hazardous chemicals, and control methods of any routinely used hazardous materials and any new hazardous materials to which the employees may be exposed. The MSDSs and HSFSSs will be used to review information on the hazardous chemicals.
4. A review of the facility's health and safety policy and procedure manual.
5. A copy of the RTK brochure is distributed.

Contractor Employees

_____ (name) advises outside contractors in person of any chemical hazards that may be encountered in the normal course of their work on the site, the labeling systems in use, protective measures to be taken, the location and availability of MSDSs, HSFSSs, and other health hazard information, and the safe handling procedures to be used for these materials.

It is our policy that each outside contractor who brings hazardous chemicals on the site will provide _____ (name) with copies of appropriate MSDSs for the hazardous chemicals, information on any special labels used, and precautionary measures to be taken while working with or around their hazardous chemicals or products.

All employees, or their designated representative, can obtain additional information on this written program, the PEOSH HCS, applicable MSDSs and HSFSSs, and other chemical information from _____ (name) _____ in room _____.

(Signature of Owner/Manager Representative)

Title

Date

Resources for Additional Information

New Jersey Department of Health and Senior Services
Public Employees Occupational Safety and Health Program
PO Box 360
Trenton, NJ 08625-0360
(609) 984-1863
<http://www.nj.gov/health/eoh/peoshweb>

New Jersey Department of Labor
and Workforce Development
Division of Public Safety and
Occupational Safety and Health
PO Box 386
Trenton, NJ 08625-0386
(609) 633-2587
<http://www.nj.gov/labor/lsse/lspeosh.html>

U.S. Department of Labor
Occupational Safety and Health Administration (OSHA)
<http://www.osha.gov>

For information about the Right to Know law, contact:

New Jersey Department of Health and Senior Services
Right to Know Program
PO Box 368
Trenton, NJ 08625-0368
(609) 984-2202
<http://www.nj.gov/health/eoh/rtkweb>

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APPENDIX

Appendix A

PEOSH Hazard Communication Standard N.J.A.C. 12:100-7

DIVISION OF PUBLIC SAFETY AND OCCUPATIONAL SAFETY AND HEALTH

Safety and Health Standards for Public Employees

Adoption of Standards; General Standards; Standard for Hazard Communication; Standards for Firefighters; Standards and Publications Referred to in this Chapter

Adopted New Rules: N.J.A.C. 12:100-3A and 7

Adopted Amendments: N.J.A.C. 12:100-4.2, 10.1 through 10.7, 10.9, 10.10, 10.13, 10.16, 17.1 and 17.3

Proposed: January 5, 2004 at 36 N.J.R. 150(a).

Adopted: April 8, 2004 by Albert G. Kroll, Commissioner, Department of Labor.

Filed: April 8, 2004 as R.2004 d. 183, **with substantive changes** not requiring additional public notice and comment (see N.J.A.C. 1:30-6.3).

Authority: N.J.S.A. 34:6A-25 et seq.

Effective Date: May 3, 2004.

Expiration Date: August 26, 2004.

Summary of Hearing Officer's Recommendations and Agency Response:

A public hearing on the proposed amendments was held on January 29, 2004 at the Department of Labor, John Fitch Plaza, Trenton, New Jersey. Frederick S. Cohen, Regulatory Officer, was available to preside at the hearing and to receive testimony. In the course thereof, one public comment was received from Rick Engler of the New Jersey Work Environment Council. The Hearing Officer made no recommendations. The hearing record may be reviewed by contacting Frederick S. Cohen, Regulatory Officer, Office of Regulatory Services, New Jersey Department of Labor, P0 Box 110—13th Floor, Trenton, New Jersey 08625-0110.

Summary of Public Comments and Agency Responses:

COMMENT: The New Jersey Work Environment Council (WEC) is an alliance of 69 labor, community and environmental organizations working together for safe, secure jobs, and a healthy, sustainable environment. The following are WEC's comments as presented by Rick Engler, WEC Director, and Eileen Senn, WEC Industrial Hygiene Consultant, on the proposed adoption of Public Employees Occupational Safety and Health (PEOSH) Standard N.J.A.C. 12:100-7, Standard for Hazard Communication.

(1) WEC supports the proposed standard. The basic goal of a Hazard Communication Program is to be sure employers and employees know about chemical hazards and how to protect themselves; this should help reduce the incidence of chemical source illness and injuries. The proposed standard is necessary to bring New Jersey's State Plan regulatory requirements into compliance with those mandated by the U.S. Department of Labor, Occupational Safety and Health Administration.

(2) WEC encourages PEOSH to allow employers to use the existing Right-to-Know Act (RTK) Survey to meet Hazard Communication requirements for listing hazardous chemicals. Employers can be instructed to simply list additional ingredients on the form that are not on the Workplace Hazardous Substance List.

(3) WEC supports PEOSH plans to provide written guidance for employers on how to comply with Hazard Communication as well as to provide a Model Written Hazard Communication Program.

(4) WEC asks for assurance that Hazard Communication inspections by the PEOSH Program will meet or exceed the quality and quantity the RTK Program was performing to enforce RTK requirements in the public sector. WEC urges PEOSH to include a compliance check for the requirements of Hazard

Communication during every inspection that PEOSH undertakes, whether health or safety, complaint or programmed. Violations of the Hazard Communication Standard are the most common violations found during Federal OSHA inspections in the private sector. Widespread non-compliance in the public sector can be anticipated and needs to be effectively addressed.

RESPONSE: The Division will conduct its Hazard Communication inspections according to the letter of the law and in a fashion that is both thorough and complete.

Federal Standards Statement

Federal standards affected by these standards are contained in 29 CFR §1910, Occupational Safety and Health Standards. New Jersey's Safety and Health Standards for Public Employees are being amended to bring them into compliance with the Federal standards as required by New Jersey's Developmental Plan under its initial approval as a State Plan for Public Employees Only by the United States Department of Labor, Occupational Safety and Health Administration.

SUBCHAPTER 3A. ADOPTION OF STANDARDS

12: 100-3A.1 Adoption of standards in compliance with applicable Federal standards

The Commissioner shall provide for the adoption of all applicable occupational health and safety standards, amendments or changes adopted or recognized by the Secretary under the authority of the Occupational Safety and Health Act of 1970. Whenever the United States Secretary of Labor adopts a standard pursuant to the provisions of the Occupational Safety and Health Act of 1970 (29 U.S.C. §§651 et seq.), the Commissioner shall publish that Federal standard within six months of Federal adoption in the New Jersey Register in accordance with the provisions of N.J.S.A. 52:14B-5 and, notwithstanding the provisions of N.J.S.A. 52:14B-4, that Federal standard shall be deemed to be duly adopted as a State rule upon its publication by the Commissioner.

12: 100-3A.2 Adoption of standards more stringent than Federal standards

(a) The Commissioner shall not adopt any standard within the scope of the State Uniform Construction Code adopted pursuant to N.J.S.A. 52:27D-1 19 et seq., or the Uniform Fire Safety Code adopted pursuant to N.J.S.A. 52:27D-192 et seq., unless the standard is one adopted pursuant to N.J.A.C. 12:100-4. If the Commissioner of Community Affairs determines that a building or structural safety standard adopted by the Commissioner pursuant to N.J.A.C. 12:100-4 is more stringent than the applicable standards found in the State Uniform Construction Code or the Uniform Fire Safety Code, he or she shall adopt a rule incorporating the more stringent standard. If the Commissioner of Community Affairs determines that there is a difference between a provision of any new or existing standard adopted pursuant to N.J.A.C. 12:100-4 and a provision of the Uniform Construction Code or the Uniform Fire Safety Code, and he or she determines that the provision of the applicable code is as effective as the provision of the standard, he or she shall prepare and submit to the Commissioner an application for submission to the Secretary of Labor seeking the approval of that provision of the Uniform Construction Code or the Uniform Fire Safety Code as being as effective as the provision of the standard and the approval of the incorporation of the code provision into the State Plan.

(b) Where no Federal standards are applicable or where standards more stringent than the Federal standards are deemed advisable, the Commissioner shall, in consultation with the Commissioner of Health and Senior Services and the Commissioner of Community Affairs, and with the advice of the Public Employees' Occupational Safety and Health Advisory Board, provide for the development of State standards as may be necessary.

12: 100-3A.3 Adoption of emergency temporary standards

The Commissioner shall provide for the adoption of all emergency temporary standards, amendments or changes adopted or recognized by the United States Secretary of Labor under the authority of the Occupational Safety and Health Act of 1970 (29 U.S.C. §§651 et seq.). The Commissioner shall publish that Federal standard within 30 days of Federal adoption in the New Jersey Register in accordance with the provisions of N.J.S.A. 52:14B-5 and, notwithstanding the provisions of N.J.S.A. 52:14B-4, that Federal standard shall be deemed to be duly adopted as a State regulation upon its publication by the Commissioner.

SUBCHAPTER 4. GENERAL STANDARDS

12:100-4.2 Adoption by reference

(a) The standards contained in 29 CFR Part 1910, General Industry Standards, with amendments published in the Federal Register through April 23, 1998 and any subsequent amendments thereto, with certain exemptions noted in (b) below, are adopted upon publication in the New Jersey Register and are incorporated herein by reference as occupational safety and health standards for the protection of public employees engaged in general operations and shall include:

- 1.-19. (No change.)
20. Subpart Z—Toxic and Hazardous Substances.
- (b) (No change.)

SUBCHAPTER 7. STANDARD FOR HAZARD COMMUNICATION

12:100-7.1 Purpose

(a) The purpose of this subchapter is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

1. This occupational safety and health standard is intended to address comprehensively the issue of evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, and to preempt any legal requirements of a state, or political subdivision of this State, pertaining to this subject. Evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for: developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of material safety data sheets to employees and downstream employers, and development and implementation of employee training programs regarding hazards of chemicals and protective measures.

12:100-7.2 Scope and application

(a) This subchapter requires chemical manufacturers or importers to assess the hazards of chemicals which they produce or import, and all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program, labels and other forms of warning, material safety data sheets, and information and training. In addition, this subchapter requires distributors to transmit the required information to employers. Employers who do not produce or import chemicals need only focus on those parts of this rule that deal with establishing a workplace program and communicating information to their workers. Appendix E of this subchapter, incorporated herein by reference, is a general guide for such employers to help them determine their compliance obligations under these rules.

(b) This subchapter applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

(c) This subchapter applies to laboratories only as follows:

1. Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;
2. Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible during each work shift to laboratory employees when they are in their work areas;
3. Employees shall ensure that laboratory employees are provided information and training in accordance with N.J.A.C. 12:100-7.8, except for the location and availability of the written hazard communication program under N.J.A.C. 12:100-7.8(b)3; and
4. Laboratory employers that ship hazardous chemicals are considered to be either a chemical manufacturer or a distributor under this rule. Thus, they must ensure that any containers of hazardous chemicals leaving the laboratory are labeled in accordance with N.J.A.C. 12:100-7.6(a), and that a material

safety data sheet is provided to distributors and other employers in accordance with N.J.A.C. 12:100-7.7(f) and (g).

(d) In work operations where employees only handle chemicals in sealed containers, which are not opened under normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this subchapter applies to these operations only as follows:

1. Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

2. Employers shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals or shall obtain a material safety data sheet as soon as possible for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material data sheet and shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work area(s); and

3. Employers shall ensure that employees are provided with information and training in accordance with N.J.A.C. 12:100-7.8 (except for the location and availability of the written hazard communication program under N.J.A.C. 12:100-7.8(b)3), to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

(e) This subchapter does not require labeling of the following chemicals:

1. Any pesticides as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§136 et seq., when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

2. Any chemical substance or mixture as such terms are defined in the Toxic Substances Control Act, 15 U.S.C. §§2601 et seq., when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Environmental Protection Agency;

3. Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device or product, including materials intended for use as ingredients in such products (for example, flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. §§301 et seq., or the Virus-Serum-Toxin Act of 1913, 21 U.S.C. §§151 et seq., and regulations issued under those Acts, when they are subject to the labeling requirements under those Acts by either the Food and Drug Administration or the Department of Agriculture;

4. Any distilled spirits (beverage alcohols), wine, or malt beverage intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act, 27 U.S.C. §§201 et seq., and regulations issued under that Act, when subject to the labeling requirements of that Act and labeling regulations issued under that Act by the Bureau of Alcohol, Tobacco, and Firearms;

5. Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act, 15 U.S.C. §§2051 et seq., and Federal Hazardous Substances Act, 15 U.S.C. §§1261 et seq., respectively, when subject to a consumer product safety standard or labeling requirement of those Acts, or regulations issued under those Acts by the Consumer Product Safety Commission; and

6. Agricultural or vegetable seed treated with pesticides and labeled in accordance with the Federal Seed Act, 7 U.S.C. §§1551 et seq., and the labeling regulations issued under that Act by the Department of Agriculture.

(f) This subchapter does not apply to:

1. Any hazardous waste as such term is defined by the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended, 42 U.S.C. §§6901 et seq., when subject to regulations issued under that Act by the Environmental Protection Agency;

2. Any hazardous substance as such term is defined by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. §§9601 et seq., when the hazardous substance is the focus of remedial or removal actions being conducted under CERCLA in accordance with the Environmental Protection Agency regulations;

3. Tobacco or tobacco products;

4. Wood or wood products, including lumber which will not be processed, where the chemical manufacturer or importer can establish that the only hazard they pose to employees is the potential for flammability or combustibility. Wood or wood products, which have been treated with a hazardous chemical covered by this standard, and wood which may be subsequently sawed or cut, generating dust, are not exempted;

5. Articles, as the term is defined in N.J.A.C. 12:100-7.3;

6. Food or alcoholic beverages which are sold, used, or prepared in a retail establishment such as a grocery store, restaurant, or drinking place, and foods intended for personal consumption by employees while in the workplace;

7. Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act, 21 U.S.C. §§301 et seq., when it is in solid, final form for direct administration to the patient (for example, tablets or pills); drugs which are packaged by the chemical manufacturer for sale to consumers in a retail establishment (for example, over-the-counter drugs); and drugs intended for personal consumption by employees while in the workplace (for example, first aid supplies);

8. Cosmetics, which are packaged for sale to consumers in a retail establishment, and cosmetics intended for personal consumption by employees while in the workplace;

9. Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act, 15 U.S.C. §§2051 et seq., and Federal Hazardous Substances Act, 15 U.S.C. §§1261 et seq., respectively, where the employer can show that it is used in the workplace for the purpose intended by the chemical manufacturer or importer of the product, and the use results in a duration and frequency of exposure which is not greater than the range of exposures that could reasonably be experienced by consumers when used for the purpose intended;

10. Nuisance particulates where the chemical manufacturer or importer can establish that they do not pose any physical or health hazard covered under this section;

11. Ionizing and non-ionizing radiation; and

12. Biological hazards.

12:100-7.3 Definitions

The following words and terms, as used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise:

“Article” means a manufactured item other than a fluid or particle:

1. Which is formed to a specific shape or design during manufacture;

2. Which has end use function(s) dependent in whole or in part upon its shape or design during end use; and

3. Which under normal conditions of use does not release more than very small quantities, for example, minute or trace amounts of a hazardous chemical (as determined under N.J.A.C. 12:100-7.4), and does not pose a physical hazard or health risk to employees.

“Chemical” means any element, chemical compound or mixture of elements and/or compounds.

“Chemical manufacturer” means an employer with a workplace where chemical(s) are produced for use or distribution.

“Chemical name” means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

“Combustible liquid” means any liquid having a flashpoint at or above 100 degrees Fahrenheit (37.8 degrees Celsius), but below 200 degrees Fahrenheit (93.3 degrees Celsius), except any mixture having components with flashpoints of 200 degrees Fahrenheit (93.3 degrees Celsius), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

“Commercial account” means an arrangement whereby a retail distributor sells hazardous chemicals to an employer, generally in large quantities over time and/or at costs that are below the regular retail price.

“Common name” means any designation or identification such as code name, code number, trade name and brand name or generic name used to identify a chemical other than by its chemical name.

“Compressed gas” means:

1. A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 degrees Fahrenheit (21.1 degrees Celsius);

2. A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 degrees Fahrenheit (54.4 degrees Celsius) regardless of the pressure at 70 degrees Fahrenheit (21.1 degrees Celsius); or

3. A liquid having a vapor pressure exceeding 40 psi at 100 degrees Fahrenheit (37.8 degrees Celsius) as determined by ASTM D-323-72.

“Container” means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.

“Designated representative” means any individual or organization to which an employee gives written authorization to exercise such employee’s rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

“Director” means the Director, National Institute for Occupational Safety and Health, United States Department of Health and Human Services, or designee.

“Distributor” means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

“Employee” means a worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers such as office workers or bank tellers who encounter hazardous chemicals only in nonroutine, isolated instances are not covered.

“Explosive” means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

“Exposure” or “exposed” means that an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (for example, accidental or possible) exposure. “Subjected” in terms of health hazards includes any route of entry (for example, inhalation, ingestion, skin contact or absorption).

“Flammable” means a chemical that falls into one of the following categories:

1. “Aerosol, flammable” means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame projection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

2. “Gas, flammable” means a gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or a gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit;

3. “Liquid, flammable” means any liquid having a flashpoint below 100 degrees Fahrenheit (37.8 degrees Celsius), except any mixture having components with flashpoints of 100 degrees Fahrenheit (37.8 degrees Celsius) or higher, the total of which make up 99 percent or more of the total volume of the mixture;

4. “Solid, flammable” means a solid, other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and, when ignited, burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

“Flashpoint” means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

1. Tagliabue Closed Tester (see American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100 degrees Fahrenheit (37.8 degrees Celsius), that do not contain suspended solids and do not have a tendency to form a surface film under test;

2. Pensky-Martens Closed Tester (see American National Standard Method of Test for Flash Point by Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100 degrees Fahrenheit (37.8 degrees Celsius), or that contain suspended solids, or that have a tendency to form a surface film under test; or

3. Setaflash Closed Tester (see American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Organic peroxides, which undergo auto-accelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

“Foreseeable emergency” means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment, which could result in an uncontrolled release of a hazardous chemical into the workplace.

“Hazardous chemical” means any chemical which is a physical hazard or a health hazard.

“Hazardous Substance Fact Sheet” means a written document prepared by the New Jersey Department of Health and Senior Services for each hazardous substance on the Right to Know Hazardous Substance List except for generic categories, and transmitted by the Department to public employers, county health departments, county clerks, designated county lead agencies and the public pursuant to the provisions of the Worker and Community Right to Know Act, N.J.S.A. 34:5A-1 et seq.

“Hazard warning” means any words, pictures, symbols, or combination thereof, appearing on a label or other appropriate form of warning which convey the specific physical and health hazard(s), including target organ effects, of the chemical(s) in the container(s). (See the definitions for “physical hazard” and “health hazard” to determine the hazards which must be covered.)

“Health hazard” means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term “health hazard” includes chemicals, which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents that act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A of this subchapter, incorporated herein by reference, provides further definitions and explanations of the scope of health hazards covered by this subchapter, and Appendix B of this subchapter, incorporated herein by reference, describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

“Identity” means any chemical or common name, which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

“Immediate use” means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

“Importer” means the first business with employees within the Customs Territory of the United States, which receives hazardous chemicals produced in other countries for the purpose of supplying them to distributors or employers within the United States.

“Label” means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

“Material safety data sheet (MSDS)” means written or printed material concerning a hazardous chemical, which is prepared in accordance with N.J.A.C. 12:100-7.7.

“Mixture” means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

“Organic peroxide” means an organic compound that contains the bivalent -O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

“Oxidizer” means a chemical other than a blasting agent or explosive as defined in 29 CFR 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

“Physical hazard” means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

“Produce” means to manufacture, process, formulate, blend, extract, generate, emit, or repackage.

“Pyrophoric” means a chemical that will ignite spontaneously in air at a temperature of 130 degrees Fahrenheit (54.4 degrees Celsius) or below.

“Responsible party” means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

“Right to Know Hazardous Substance List” includes the workplace hazardous substance list and the environmental hazardous substance list.

“Right to Know Survey” includes the workplace survey and environmental survey.

“Specific chemical identity” means the chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

“Technically qualified person” means:

1. For training purposes, a person who is a registered nurse, a certified safety professional, or a certified industrial hygienist, or has a bachelor’s degree or higher in industrial hygiene, environmental science, health education, chemistry, or a related field, and understands the health risks associated with exposure to hazardous substances;

2. For training purposes, a person who has completed at least 30 hours of hazardous materials training offered by the New Jersey State Safety Council, the New Jersey Department of Health and Senior Services, an accredited public or private educational institution, labor union, trade association, private organization or government agency, and understands the health risks associated with exposure to hazardous substances, and has at least one year of experience handling hazardous substances or working with hazardous substances. The 30-hour requirement may be met by the combination of one or more hazardous materials training courses; or

3. For purposes of teaching the recruit firefighting training course established by the New Jersey Department of Community Affairs, a person who has fulfilled the requirements of Firefighter Instructor Level I as certified by the Department of Community Affairs.

“Trade secret” means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer’s business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. Appendix D of this subchapter, incorporated herein by reference, sets out the criteria to be used in evaluating trade secrets.

“Unstable (reactive)” means a chemical, which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

“Use” means to package, handle, react, emit, extract, generate as a byproduct, or transfer.

“Water-reactive” means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

“Work area” means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

“Workplace” means an establishment, job site, or project, at one geographical location containing one or more work areas.

“Workplace Hazardous Substance List” means the list of hazardous substance developed by the New Jersey Department of Health and Senior Services pursuant to N.J.S.A. 34:5A-5. The Workplace Hazardous Substance List is incorporated into the Right to Know Hazardous Substance List.

“Workplace survey” means a written document, prepared by the New Jersey Department of Health and Senior Services and completed by a public employer pursuant to the Worker and Community Right to Know Act, on which the employer shall report each hazardous substance on the Right to Know Hazardous Substance List present at its facility. The workplace survey is incorporated into the Right to Know Survey.

12:100-7.4 Hazard determination

(a) Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

(b) Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning such hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definitions of health hazards in this section. Appendix A shall be consulted for the scope of health hazards covered, and Appendix B shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

(c) The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

1. 29 CFR §1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA); or

2. “Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment,” American Conference of Governmental Industrial Hygienists (ACGIH) (2003 Edition). The chemical manufacturer, importer, or employer is still responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with the requirements of this standard.

(d) Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes: National Toxicology Program (NTP), “Annual Report on Carcinogens” (10th Edition);

International Agency for Research on Cancer (IARC) “Monographs”; or 29 CFR §1910, subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration.

1. The “Registry of Toxic Effects of Chemical Substances” published by the National Institute for Occupational Safety and Health indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

(e) The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

1. If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

2. If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under N.J.A.C. 12:100-7.4(d);

3. If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and

4. If the chemical manufacturer, importer, or employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees in those concentrations, the mixture shall be assumed to present the same hazard.

(f) Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the Commissioner of Labor and/or Commissioner of Health and Senior Services and the Director. The written description may be incorporated into the written hazard communication program required under N.J.A.C. 12:100-7.5.

12:100-7.5 Written hazard communication program

(a) Employers shall develop, implement, and maintain at each workplace, a written hazard communication program which at least describes how the criteria specified in N.J.A.C. 12:100-7.6, 7.7 and 7.8 for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:

1. A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas); and

2. The methods the employer will use to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

(b) Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication programs developed and implemented under N.J.A.C. 12:100-7.5 include the following:

1. The methods the employer will use to provide the other employer(s) on-site access to material safety data sheets for each hazardous chemical the other employer(s) employees may be exposed to while working;

2. The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace’s normal operating conditions and in foreseeable emergencies; and

3. The methods the employer will use to inform the other employer(s) of the labeling system used in the workplace.

(c) The employer may rely on an existing hazard communication program to comply with these requirements, provided that it meets the criteria established in this section.

(d) The employer shall make the written hazard communication program available, upon request, to employees, their designated representatives, the Commission of Labor and/or the Commissioner of Health and Senior Services and the Director, in accordance with the requirements of 29 CFR §1910.1020(e).

(e) Where employees must travel between workplaces during a work shift, that is, their work is carried out at more than one geographical location, the written hazard communication program may be kept at the primary workplace facility.

12:100-7.6 Labels and other forms of warning

(a) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

1. The identity of the hazardous chemical(s);
2. Appropriate hazard warnings; and
3. The name and address of the chemical manufacturer, importer, or other responsible party.

(b) For solid metal (such as a steel beam or a metal casting), solid wood, or plastic items that are not exempted as articles due to their downstream use, or shipments of whole grain, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes.

1. The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to, or at the time of, the first shipment.

2. This exception to requiring labels on every container of hazardous chemicals is only for the solid material itself, and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the material and to which employees handling the items in transit may be exposed (for example, cutting fluids or pesticides in grains).

(c) Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner which does not conflict with the requirements of the Hazardous Materials Transportation Act, 49 U.S.C. §§1801 et seq., and regulations issued under that Act by the Department of Transportation.

(d) If the hazardous chemical is regulated by U.S. Occupational Safety and Health Administration in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

(e) Except as provided in N.J.A.C. 12:100-7.6(f) and 7.8(g), the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

1. The identity of the hazardous chemical(s) contained therein; and

2. Appropriate hazard warnings, or alternatively, words, pictures, symbols, or combination thereof, which provide at least general information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the hazard communication program, will provide employees with the specific information regarding the physical and health hazards of the hazardous chemical.

(f) The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by N.J.A.C. 12:100-7.6(e) to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

(g) The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer. For purposes of this section, drugs which are dispensed by a pharmacy to a health care provider for direct administration to a patient are exempted from labeling.

(h) The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

(i) The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

(j) The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

(k) Chemical manufacturers, importers, distributors, or employers who become newly aware of any significant information regarding the hazards of a chemical shall revise the labels for the chemical within three months of becoming aware of the new information. Labels on containers of hazardous chemicals

shipped after that time shall contain the new information. If the chemical is not currently produced or imported, the chemical manufacturer, importers, distributor, or employer shall add the information to the label before the chemical is shipped or introduced into the workplace again.

12:100-7.7 Material safety data sheets

(a) Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet in the workplace for each hazardous chemical, which they use.

(b) Each material safety data sheet shall be in English (although the employer may maintain copies in other languages as well), and shall contain at least the following information:

1. The identity used on the label, and, except as provided for in N.J.A.C. 12:100-7.9 concerning trade secrets:

i. If the hazardous chemical is a single substance, its chemical and common name(s);

ii. If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or

iii. If the hazardous chemical is a mixture which has not been tested as a whole:

(1) The chemical and common name(s) of all ingredients, which have been determined to be health hazards, and which comprise one percent or greater of the composition, except that chemicals identified as carcinogens under N.J.A.C. 12:100-7.4 shall be listed if the concentrations are 0.1 percent or greater;

(2) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than one percent (0.1 percent for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established OSHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health risk to employees; and

(3) The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

2. The physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

3. The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

4. The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

5. The primary route(s) of entry;

6. The OSHA permissible exposure limit, ACGIH Threshold Limit Value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

7. Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions) or by OSHA;

8. Any generally applicable precautions for safe handling and use, which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

9. Any generally applicable control measures, which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

10. Emergency and first aid procedures;

11. The date of preparation of the material safety data sheet or the last change to it; and

12. The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

(c) If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

(d) Where complex mixtures have similar hazards and contents (that is, the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

(e) The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer preparing the material safety data sheet becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

(f) Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated.

1. The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the distributor or employer prior to or at the time of the shipment.

2. If the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the distributor or employer shall obtain one from the chemical manufacturer or importer as soon as possible.

3. The chemical manufacturer or importer shall also provide distributors or employers with a material safety data sheet upon request.

(g) Distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and employers with their initial shipment and with the first shipment after a material safety data sheet is updated.

1. The distributor shall either provide material safety data sheets with the shipped containers, or send them to the other distributor or employer prior to or at the time of the shipment.

2. Retail distributors selling hazardous chemicals to employers having a commercial account shall provide a material safety data sheet to such employers upon request, and shall post sign or otherwise inform them that a material safety data sheet is available.

3. Wholesale distributors selling hazardous chemicals to employers over the counter may also provide material safety data sheets upon the request of the employer at the time of the over-the-counter purchase, and shall post a sign or otherwise inform such employers that a material safety data sheet is available.

4. If an employer without a commercial account purchases a hazardous chemical from a retail distributor not required to have material safety data sheets on file (that is, the retail distributor does not have commercial accounts and does not use the materials), the retail distributor shall provide the employer, upon request, with the name, address, and telephone number of the chemical manufacturer, importer, or distributor from which a material safety data sheet can be obtained.

5. Wholesale distributors shall also provide material safety data sheets to employers or other distributors upon request.

6. Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors that have informed them that the retail distributor does not sell the product to commercial accounts or open the sealed container to use it in their own workplaces.

(h) The employer shall maintain in the workplace copies of the required material safety data sheets for each hazardous chemical, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s). (Electronic access, microfiche, and other alternatives to maintaining paper copies of the material safety data sheets are permitted as long as no barriers to immediate employee access in each workplace are created by such options.)

(i) Where employees must travel between workplaces during a work shift, that is, their work is carried out at more than one geographical location, the material safety data sheets may be kept at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

(j) Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazard chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in their work area(s).

(k) Material safety data sheets shall also be made readily available, upon request, to designated representatives and to the Director, in accordance with the requirements of 29 CFR §1910.1020(e). The Director shall also be given access to material safety data sheets in the same manner.

12:100-7.8 Employee information and training

(a) Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new physical or health hazard the employees have not previously been trained about is introduced into their work area. Refresher training, which shall be an abbreviated version of initial training, shall be conducted every two years. Employers shall ensure that all employees participate in a training program that must be provided at no cost to the employee and during working hours. Information and training may be designed to cover categories of hazards (for example, flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels, hazardous substance fact sheets, and material safety data sheets.

(b) Employees shall be informed of:

1. The requirements of this section;
2. Any operations in their work area where hazardous chemicals are present;
3. The location and availability of the written hazard communication program, including the list(s) of hazardous chemicals required by the hazard communication program, hazardous substance fact sheets, the Right to Know Survey, the Right to Know Hazardous Substance List, and material safety data sheets required by this section; and
4. The applicable provisions of the Worker and Community Right to Know Act, N.J.S.A. 34:5A-1 et seq.

(c) Employee training shall include at least:

1. Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
2. The physical and health hazards of the chemicals in the work area;
3. The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used;
4. The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information;
5. Information about the applicable provisions of the Worker and Community Right to Know Act, N.J.S.A. 34:5A-1 et seq., which shall include an explanation of the Right to Know Survey, labeling, hazardous substance fact sheets, the Right to Know Hazardous Substance List, and the Right to Know poster, and how employees can obtain these documents and use appropriate hazard information from these sources; and
6. A copy of the Right to Know brochure. When refresher training is given, the Right to Know brochure shall be distributed to all employees.

(d) An employer shall use a technically qualified person to conduct its training session.

(e) Training records shall include the following information:

1. The dates of the training sessions;
2. The contents or a summary of the training sessions;
3. The names and qualifications of persons conducting the training; and
4. The names and job titles of all persons attending the training sessions.

(f) Training records shall be maintained for the duration of the employee's employment.

(g) Training records shall be available as follows:

1. The employer shall ensure that all training records required to be maintained by this standard shall be made available upon request to the Commissioner of Labor or the Commissioner of Health and Senior Services for examination and copying.
2. Employee training records required by this standard shall be provided upon request for examination and copying to employees, to employee representatives, to the Commissioner of Labor, and to the Commissioner of Health and Senior Services.

(h) Material appropriate in content and vocabulary to educational level, literacy, and language of employees shall be used.

12:100-7.9 Trade secrets

(a) The chemical manufacturer, importer, or employer may withhold the specific chemical identity, including the chemical name and other specific identification of a hazardous chemical, from the material safety data sheet, provided that:

1. The claim that the information withheld is a trade secret can be supported;
2. Information contained in the material safety data sheet concerning the properties and effects of the hazardous chemical is disclosed;
3. The material safety data sheet indicates that the specific chemical identity is being withheld as a trade secret; and
4. The specific chemical identity is made available to health professionals, employees, and designated representatives in accordance with the applicable provisions of this section.

(b) Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity of a trade secret chemical to that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The chemical manufacturer, importer, or employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of (c) and (d) below, as soon as circumstances permit.

(c) In non-emergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under (a) above, to a health professional (that is, physician, industrial hygienist, toxicologist, epidemiologist, or occupational health nurse) providing medical or other occupational health services to exposed employee(s), and to employees or designated representatives, if:

1. The request is in writing;
2. The request describes with reasonable detail one or more of the following occupational health needs for the information:
 - i. To assess the hazards of the chemicals to which employees will be exposed;
 - ii. To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

- iii. To conduct pre-assignment or periodic medical surveillance of exposed employees;
 - iv. To provide medical treatment to exposed employees;
 - v. To select or assess appropriate personal protective equipment for exposed employees;
 - vi. To design or assess engineering controls or other protective measures for exposed employees; and
 - vii. To conduct studies to determine the health effects of exposure.
3. The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information to the health professional, employee, or designated representative, would not satisfy the purposes described in (c)2 above:

- i. The properties and effects of the chemical;
 - ii. Measures for controlling workers' exposure to the chemical;
 - iii. Methods of monitoring and analyzing worker exposure to the chemical; and
 - iv. Methods of diagnosing and treating harmful exposures to the chemical;
4. The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and

5. The health professional, and the employer or contractor of the services of the health professional (that is, downstream employer, labor organization, or individual employee), employee, or designated representative, agree in a written confidentiality agreement that the health professional, employee, or designated representative, will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to the U.S. Occupational Safety and Health Administration, as provided in (f) below, except as authorized by the terms of the agreement or by the chemical manufacturer, importer, or employer.

(d) The confidentiality agreement authorized by (c)4 above:

1. May restrict the use of the information to the health purposes indicated in the written statement of need;
2. May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable pre-estimate of likely damages; and

3. May not include requirements for the posting of a penalty bond.

(e) Nothing in this subchapter is meant to preclude the parties from pursuing non-contractual remedies to the extent permitted by law.

(f) If the health professional, employee, or designated representative receiving the trade secret information decides that there is a need to disclose it to OSHA, the chemical manufacturer, importer, or employer who provided the information shall be informed by the health professional, employee, or designated representative prior to, or at the same time as, such disclosure.

(g) If the chemical manufacturer, importer, or employer denies a written request for disclosure of a specific chemical identity, the denial must:

1. Be provided to the health professional, employee, or designated representative, within 30 days of the request;

2. Be in writing;

3. Include evidence to support the claim that the specific chemical identity is a trade secret;

4. State the specific reasons why the request is being denied; and

5. Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific chemical identity.

(h) The health professional, employee, or designated representative whose request for information is denied under (c) above may refer the request and the written denial of the request to the Commissioner of Labor and/or Commissioner of Health and Senior Services for consideration.

(i) When a health professional, employee, or designated representative refers the denial to the Commissioner of Labor and/or the Commissioner of Health and Senior Services under (h) above, New Jersey Public Employees Occupational Safety and Health shall consider the evidence to determine if:

1. The chemical manufacturer, importer, or employer has supported the claim that the specific chemical identity is a trade secret;

2. The health professional, employee, or designated representative has supported the claim that there is a medical or occupational health need for the information; and

3. The health professional, employee or designated representative has demonstrated adequate means to protect the confidentiality.

(j) If the Commissioner of Labor and/or the Commissioner of Health and Senior Services determines that the specific chemical identity requested under (c) above is not a “bona fide” trade secret, or that it is a trade secret, but the requesting health professional, employee, or designated representative has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means to protect the confidentiality of the information, the chemical manufacturer, importer, or employer will be subject to citation by the Commissioner of Labor.

(k) If a chemical manufacturer, importer, or employer demonstrates to the Commissioner of Labor and/or the Commissioner of Health and Senior Services that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the Commissioner of Labor and/or the Commissioner of Health and Senior Services may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health services are provided without an undue risk of harm to the chemical manufacturer, importer, or employer.

(l) If a citation for a failure to release specific chemical identity information is contested by the chemical manufacturer, importer, or employer, the matter will be adjudicated before the Occupational Safety and Health Review Commission in accordance with the Act’s enforcement scheme and the applicable Commission rules of the procedure. In accordance with the Commission rules, when a chemical manufacturer, importer, or employer continues to withhold the information during the contest, the Administrative Law Judge may review the citation and supporting documentation “in ca or issue appropriate orders to protect the confidentiality of such matters.

(m) Notwithstanding the existence of a trade secret claim, a chemical manufacturer, importer, or employer shall, upon request, disclose to the Commissioner of Labor and/or the Commissioner of Health and Senior Services any information which this subchapter requires the chemical manufacturer, importer, or employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the Commissioner of Labor and/or the Commissioner of Health and Senior Services so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

(n) Nothing in this section shall be construed as requiring the disclosure under any circumstances of process or percentage of mixture information, which is a trade secret.

APPENDIX A

Health Hazard Definitions (Mandatory)

Although safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (for example, flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body—such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees such as shortness of breath, a nonmeasurable, subjective feeling. Employees exposed to such hazards must be apprised of both the change in body function and the signs and symptoms that may occur to signal that change.

The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in non-occupationally-exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely seen in the population at large, such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

There have been many attempts to categorize effects and to define them in various ways. Generally, the terms “acute” and “chronic” are used to delineate between effects on the basis of severity or duration. “Acute” effects usually occur rapidly as a result of short-term exposure, and are of short duration. “Chronic” effects generally occur as a result of long-term exposure, and are of long duration.

The acute effects referred to most frequently are those defined by the American National Standards Institute (ANSI) standard for Precautionary Labeling of Hazardous Industrial Chemicals (Z129.1-1988)—irritation, corrosivity, sensitization and lethal dose. Although these are important health effects, they do not adequately cover the considerable range of acute effects, which may occur as a result of occupational exposure, such as, for example, narcosis.

Similarly, the term chronic effect is often used to cover only carcinogenicity, teratogenicity, and mutagenicity. These effects are obviously a concern in the workplace, but again, do not adequately cover the area of chronic effects, excluding, for example, blood dyscrasias (such as anemia), chronic bronchitis and liver atrophy.

The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. This does not negate the need for employees to be informed of such effects and protected from them. Appendix B, which is also mandatory, outlines the principles and procedures of hazard assessment.

For purposes of this section, any chemicals, which meet any of the following definitions, as determined by the criteria set forth in Appendix B are health hazards. However, this is not intended to be an exclusive categorization scheme. If there are available scientific data that involve other animal species or test methods, they must also be evaluated to determine the applicability of the Hazard Communication Standard.

1. Carcinogen: A chemical is considered to be a carcinogen if:

(a) It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or

(b) It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program; or

(c) It is regulated by OSHA as a carcinogen.

2. Corrosive: A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. For example, a chemical is considered to be corrosive if, when tested on the intact skin of albino rabbits by the method described by the United States Department of Transportation in Appendix A to 49 CFR 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term shall not refer to action on inanimate surfaces.

3. Highly toxic: A chemical falling within any of the following categories:
- (a) A chemical that has a median lethal dose (LD(50)) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
 - (b) A chemical that has a median lethal dose (LD(50)) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
 - (c) A chemical that has a median lethal concentration (LC(50)) in air of 200 parts per million by volume or less of gas or vapor, or two milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.
4. Irritant: A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by the methods of 16 CFR 1500.41 for four hours exposure or by other appropriate techniques, it results in an empirical score of five or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.
5. Sensitizer: A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.
6. Toxic: A chemical falling within any of the following categories:
- (a) A chemical that has a median lethal dose (LD(50)) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.
 - (b) A chemical that has a median lethal dose (LD(50)) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.
 - (c) A chemical that has a median lethal concentration (LC(50)) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.
7. Target Organ Effects: The following is a target organ categorization of effects, which may occur, including examples of signs and symptoms and chemicals, which have been found to cause such effects. These examples are presented to illustrate the range and diversity of effects and hazards found in the workplace, and the broad scope employers must consider in this area, but are not intended to be all-inclusive.
- (a) Hepatotoxins: Chemicals which produce liver damage.
Signs and Symptoms: Jaundice; liver enlargement.
Chemicals: Carbon tetrachloride; nitrosamines.
 - (b) Nephrotoxins: Chemicals which produce kidney damage.
Signs and Symptoms: Edema; proteinuria.
Chemicals: Halogenated hydrocarbons; uranium.
 - (c) Neurotoxins: Chemicals, which produce their primary toxic effects on the nervous system.
Signs and Symptoms: Narcosis; behavioral changes; decrease in motor functions.
Chemicals: Mercury; carbon disulfide.
 - (d) Agents, which act on the blood or hemato-poietic system:
Decrease hemoglobin function; deprive the body tissues of oxygen.
Signs and Symptoms: Cyanosis; loss of consciousness.
Chemicals: Carbon monoxide; cyanides.
 - (e) Agents which damage the lung: Chemicals which irritate or damage pulmonary tissue.
Signs and Symptoms: Cough; tightness in chest; shortness of breath.
Chemicals: Silica; asbestos.
 - (f) Reproductive toxins: Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).
Signs and Symptoms: Birth defects; sterility.
Chemicals: Lead; DBCP.
 - (g) Cutaneous hazards: Chemicals which affect the dermal layer of the body.
Signs and Symptoms: Defatting of the skin; rashes; irritation.

Chemicals: Ketones; chlorinated compounds.
(h) Eye hazards: Chemicals which affect the eye or visual capacity.
Signs and Symptoms: Conjunctivitis; corneal damage.
Chemicals: Organic solvents; acids.

APPENDIX B

Hazard Determination (Mandatory)

The quality of a hazard communication program is largely dependent upon the adequacy and accuracy of the hazard determination. The hazard determination requirement of this standard is performance-oriented. Chemical manufacturers, importers, and employers evaluating chemicals are not required to follow any specific methods for determining hazards, but they must be able to demonstrate that they have adequately ascertained the hazards of the chemicals produced or imported in accordance with the criteria set forth in this Appendix.

Hazard evaluation is a process, which relies heavily on the professional judgment of the evaluator, particularly in the area of chronic hazards. The performance-orientation of the hazard determination does not diminish the duty of the chemical manufacturer, importer or employer to conduct a thorough evaluation, examining all relevant data and producing a scientifically defensible evaluation. For purposes of this standard, the following criteria shall be used in making hazard determinations that meet the requirements of this standard.

1. Carcinogenicity: As described in N.J.A.C. 12:100-7.4(d) and subchapter Appendix A, a determination by the National Toxicology Program, the International Agency for Research on Cancer, or OSHA that a chemical is a carcinogen or potential carcinogen will be considered conclusive evidence for purposes of this section. In addition, however, all available scientific data on carcinogenicity must be evaluated in accordance with the provisions of this Appendix and the requirements of this subchapter.

2. Human data: Where available, epidemiological studies and case reports of adverse health effects shall be considered in the evaluation.

3. Animal data: Human evidence of health effects in exposed populations is generally not available for the majority of chemicals produced or used in the workplace. Therefore, the available results of toxicological testing in animal populations shall be used to predict the health effects that may be experienced by exposed workers. In particular, the definitions of certain acute hazards refer to specific animal testing results (see Appendix A).

4. Adequacy and reporting of data: The results of any studies which are designed and conducted according to established scientific principles, and which report statistically significant conclusions regarding the health effects of a chemical, shall be a sufficient basis for a hazard determination and reported on any material safety data sheet. In vitro studies alone generally do not form the basis for a definitive finding of hazard under the Hazard Communication Standard since they have a positive or negative result rather than a statistically significant finding.

The chemical manufacturer, importer, or employer may also report the results of other scientifically valid studies, which tend to refute the findings of hazard.

APPENDIX C (RESERVED)

APPENDIX D

Definition of Trade Secret (Mandatory)

The following is a reprint of the "Restatement of Torts," Section 757, comment b (1939):

Definition of trade secret. A trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business, and which gives the individual an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers. It differs from other secret information in a business (see §759 of the Restatement of Torts which is not included in this Appendix) in that it is not simply information as to single or ephemeral events in the conduct of the business, as, for example, the amount or other terms of a secret bid for a contract or the salary of certain employees, or the security investments made or contemplated, or the date fixed for the

announcement of a new policy or for bringing out a new model or the like. A trade secret is a process or device for continuous use in the operations of the business. Generally it relates to the production of goods, as, for example, a machine or formula for the production of an article. It may, however, relate to the sale of goods or to other operations in the business, such as a code for determining discounts, rebates or other concessions in a price list or a catalogue, or a list of specialized customers, or a method of bookkeeping or other office management.

Secrecy. The subject matter of a trade secret must be secret. Matters of public knowledge or of general knowledge in an industry cannot be appropriated by one as one's own secret. Neither can matters which are completely disclosed by the goods which one markets be imputed as one's own secret. Substantially, a trade secret is known only in the particular business in which it is used. It is not requisite that only the proprietor of the business knows it. The individual may, without losing his protection, communicate it to employees involved in its use. The individual may likewise communicate it to others pledged to secrecy. Others may also know of it independently, as, for example, when they have discovered the process or formula by independent invention and are keeping it secret. Nevertheless, a substantial element of secrecy must exist, so that, except by the use of improper means, there would be difficulty in acquiring the information. An exact definition of a trade secret is not possible. Some factors to be considered in determining whether given information is one's trade secret are: (1) The extent to which the information is known outside of the individual's business; (2) the extent to which it is known by employees and others involved in the individual's business; (3) the extent of measures taken by the individual to guard the secrecy of the information; (4) the value of the information to the individual and the individual's competitors; (5) the amount of effort or money expended by the individual in developing the information; and (6) the ease of difficulty with which the information could be properly acquired or duplicated by others.

Novelty and prior art. A trade secret may be a device or process, which is patentable; but it need not be that. It may be a device or process, which is clearly anticipated in the prior art or one, which is merely a mechanical improvement that a good mechanic can make. Novelty and invention are not requisite for a trade secret as they are for patent-ability. These requirements are essential to patentability because a patent protects against licensed use of the patented device or process even by one who discovers it properly through independent research. The patent monopoly is a reward to the inventor. But such is not the case with a trade secret. Its protection is not based on a policy of rewarding or otherwise encouraging the development of secret processes or devices. The protection is merely against breach of faith and reprehensible means of learning another's secret. For this limited protection it is not appropriate to require also the kind of novelty and invention, which is a requisite of patentability. The nature of the secret is, however, an important factor in determining the kind of relief that is appropriate against one who is subject to liability under the rule stated in this section. Thus, if the secret consists of a device or process which is a novel invention, one who acquires the secret wrongfully is ordinarily enjoined from further use of it and is required to account for the profits derived from the individual's past use. If, on the other hand, the secret consists of mechanical improvements that a good mechanic can make without resorting to the secret, the wrongdoer's liability may be limited to damages, and an injunction against future use of the improvements made with the aid of the secret may be inappropriate.

APPENDIX E

Guidelines for Employer Compliance (Advisory)

The Hazard Communication Standard (HCS) is based on a simple concept—that employees have both a need and a right to know the hazards and identities of the chemicals they are exposed to when working. They also need to know what protective measures are available to prevent adverse effects from occurring. The HCS is designed to provide employees with the information they need.

Knowledge acquired under the HCS will help employers provide safer workplaces for their employees. When employers have information about the chemicals being used, they can take steps to reduce exposures, substitute less hazardous materials, and establish proper work practices. These efforts will help prevent the occurrence of work-related illnesses and injuries caused by chemicals.

The HCS addresses the issues of evaluating and communicating hazards to workers. Evaluation of chemical hazards involves a number of technical concepts, and is a process that requires the professional judgment of experienced experts. That is why the HCS is designed so that employers who simply use chemicals, rather than produce or import them, are not required to evaluate the hazards of those chemicals. Hazard determination is the responsibility of the producers and importers of the materials. Producers and

importers of chemicals are then required to provide the hazard information to employers that purchase their products.

Employers that do not produce or import chemicals need only focus on those parts of the subchapter that deal with establishing a workplace program and communicating information to their workers. This Appendix is a general guide for such employers to help them determine what is required under the subchapter. It does not supplant or substitute for the regulatory provisions, but rather provides a simplified outline of the steps an average employer would follow to meet those requirements.

1. Becoming Familiar With The Subchapter.

The HCS requires information to be prepared and transmitted regarding all hazardous chemicals. The HCS covers both physical hazards (such as flammability), and health hazards (such as irritation, lung damage, and cancer). Most chemicals used in the workplace have some hazard potential, and thus will be covered by the subchapter.

One difference between this subchapter and many others adopted by OSHA is that this one is performance-oriented. That means that you have the flexibility to adapt the subchapter to the needs of your workplace, rather than having to follow specific, rigid requirements. It also means that you have to exercise more judgment to implement an appropriate and effective program.

The standard's design is simple. Chemical manufacturers and importers must evaluate the hazards of the chemicals they produce or import. Using that information, they must then prepare labels for containers, and more detailed technical bulletins called Material Safety Data Sheets (MSDS).

Chemical manufacturers, importers, and distributors of hazardous chemicals are all required to provide the appropriate labels and material safety data sheets to the employers to which they ship the chemicals. The information is to be provided automatically. Every container of hazardous chemicals you receive must be labeled, tagged, or marked with the required information. Your suppliers must also send you a properly completed material safety data sheet (MSDS) at the time of the first shipment of the chemical, and with the next shipment after the MSDS is updated with new and significant information about the hazards.

You can rely on the information received from your suppliers. You have no independent duty to analyze the chemical or evaluate the hazards of it.

Employers that "use" hazardous chemicals must have a program to ensure the information is provided to exposed employees. "Use" means to package, handle, react, or transfer. This is an intentionally broad scope, and includes any situation where a chemical is present in such a way that employees may be exposed under normal conditions of use or in a foreseeable emergency.

The requirements of the subchapter that deal specifically with the hazard communication program are found in N.J.A.C. 12:100-7.5, Written hazard communication program; 7.6, Labels and other forms of warning; 7.7, Material safety data sheets; and 7.8, Employee information and training. The requirements of these sections should be the focus of your attention. Concentrate on becoming familiar with them, using N.J.A.C. 12:100-7.2, Scope and application, and 7.3, Definitions, as references when needed to help explain the provisions.

There are two types of work operations where the coverage of the rule is limited. These are laboratories and operations where chemicals are only handled in sealed containers (for example, a warehouse). The limited provisions for these workplaces can be found in N.J.A.C. 12:100-7.2, Scope and application. Basically, employers having these types of work operations need only keep labels on containers as they are received; maintain material safety data sheets that are received, and give employees access to them; and provide information and training for employees. Employers do not have to have a written hazard communication program and lists of chemicals for these types of operations.

The limited coverage of laboratories and sealed container operations addresses the obligation of an employer to the workers in the operations involved, and does not affect the employer's duties as a distributor of chemicals. For example, a distributor may have warehouse operations where employees would be protected under the limited sealed container provisions. In this situation, requirements for obtaining and maintaining MSDSs are limited to providing access to those received with containers while the substance is in the workplace, and requesting MSDSs when employees request access for those not received with the containers. However, as a distributor of hazardous chemicals, that employer will still have responsibilities for providing MSDSs to downstream customers at the time of the first shipment and when the MSDS is updated. Therefore, although they may not be required for the employees in the work operation, the distributor may, nevertheless, have to have MSDSs to satisfy other requirements of the rule.

2. Identify Responsible Staff.

Hazard communication is going to be a continuing program in your facility. Compliance with the HCS is not a “one shot deal.” In order to have a successful program, it will be necessary to assign responsibility for both the initial and ongoing activities that have to be undertaken to comply with the rule. In some cases, these activities may already be part of current job assignments. For example, site supervisors are frequently responsible for on-the-job training sessions. Early identification of the responsible employees, and involvement of them in the development of your plan of action, will result in a more effective program design. Evaluation of the effectiveness of your program will also be enhanced by involvement of affected employees.

For any safety and health program, success depends on commitment at every level of the organization. This is particularly true for hazard communication, where success requires a change in behavior. This will only occur if employers understand the program, and are committed to its success, and if employees are motivated by the people presenting the information to them.

3. Identify Hazardous Chemicals in the Workplace.

The standard requires a list of hazardous chemicals in the workplace as part of the written hazard communication program. The list will eventually serve as an inventory of everything for which an MSDS must be maintained. At this point, however, preparing the list will help you complete the rest of the program since it will give you some idea of the scope of the program required for compliance in your facility.

The best way to prepare a comprehensive list is to survey the workplace. Purchasing records may also help, and certainly employers should establish procedures to ensure that in the future purchasing procedures result in MSDSs being received before a material is used in the workplace.

The broadest possible perspective should be taken when doing the survey. Sometimes people think of “chemicals” as being only liquids in containers. The HCS covers chemicals in all physical forms—liquids, solids, gases, vapors, fumes, and mists—whether they are “contained” or not. The hazardous nature of the chemical and the potential for exposure are the factors, which determine whether a chemical is covered. If it is not hazardous, it is not covered. If there is no potential for exposure (for example, the chemical is inextricably bound and cannot be released), the rule does not cover the chemical.

Look around. Identify chemicals in containers, including pipes, but also think about chemicals generated in the work operations. For example, welding fumes, dusts, and exhaust fumes are all sources of chemical exposures. Read labels provided by suppliers for hazard information. Make a list of all chemicals in the workplace that are potentially hazardous. For your own information and planning, you may also want to note on the list the location(s) of the products within the workplace, and an indication of the hazards as found on the label. This will help you as you prepare the rest of your program.

N.J.A.C. 12:100-7.2, Scope and application, includes exemptions for various chemicals or workplace situations. After compiling the complete list of chemicals, you should review N.J.A.C. 12:100-7.2 to determine if any of the items can be eliminated from the list because they are exempted materials. For example, food, drugs, and cosmetics brought into the workplace for employee consumption are exempt. So rubbing alcohol in the first aid kit would not be covered.

Once you have compiled as complete a list as possible of the potentially hazardous chemicals in the workplace, the next step is to determine if you have received material safety data sheets for all of them. Check your files against the inventory you have just compiled. If any are missing, contact your supplier and request one. It is a good idea to document these requests, either by copy of a letter or a note regarding telephone conversations. If you have MSDSs for chemicals that are not on your list, figure out why. Maybe you do not use the chemical anymore. Or maybe you missed it in your survey. Some suppliers do provide MSDSs for products that are not hazardous. These do not have to be maintained by you.

You should not allow employees to use any chemicals for which you have not received an MSDS. The MSDS provides information you need to ensure proper protective measures are implemented prior to exposure.

4. Preparing and Implementing a Hazard Communication Program.

All workplaces where employees are exposed to hazardous chemicals must have a written plan, which describes how the standard will be implemented in that facility. Preparation of a plan is not just a paper exercise—all of the elements must be implemented in the workplace in order to be in compliance with the subchapter. See N.J.A.C. 12:100-7.5 for the specific requirements regarding a written hazard communication program. The only work operations which do not have to comply with the written plan requirements are laboratories and work operations where employees only handle chemicals in sealed containers. See N.J.A.C. 12:100-7.2, Scope and application, for the specific requirements for these two types of workplaces.

The plan does not have to be lengthy or complicated. It is intended to be a blueprint for implementation of your program—an assurance that all aspects of the requirements have been addressed.

Many trade associations and other professional groups have provided sample programs and other assistance materials to affected employers. These have been very helpful to many employers since they tend to be tailored to the particular industry involved. You may wish to investigate whether your industry trade groups have developed such materials.

Although such general guidance may be helpful, you must remember that the written program has to reflect what you are doing in your workplace. Therefore, if you use a generic program, it must be adapted to address the facility it covers. For example, the written plan must list the chemicals present at the site, indicate who is to be responsible for the various aspects of the program in your facility, and indicate where written materials will be made available to employees.

If the Department of Labor and/or the Department of Health and Senior Services inspects your workplace for compliance with the HCS, the compliance officer will ask to see your written plan at the outset of the inspection. In general, the following items will be considered in evaluating your program.

The written program must describe how the requirements for labels and other forms of warning, material safety data sheets, and employee information and training, are going to be met in your facility. The following discussion provides the type of information compliance officers will be looking for to decide whether these elements of the hazard communication program have been properly addressed:

A. Labels and Other Forms of Warning.

In-plant containers of hazardous chemicals must be labeled, tagged, or marked with the identity of the material and appropriate hazard warnings. Chemical manufacturers, importers, and distributors are required to ensure that every container of hazardous chemicals they ship is appropriately labeled with such information and with the name and address of the producer or other responsible party. Employers purchasing chemicals can rely on the labels provided by their suppliers. If the material is subsequently transferred by the employer from a labeled container to another container, the employer will have to label that container unless it is subject to the portable container exemption. See N.J.A.C. 12:100-7.6 for specific labeling requirements.

The primary information to be obtained from an OSHA-required label is an identity for the material, and appropriate hazard warnings. The identity is any term, which appears on the label, the MSDS, and the list of chemicals, and thus links these three sources of information. The identity used by the supplier may be a common or trade name (“Black Magic Formula”), or a chemical name (1,1,1-trichloroethane). The hazard warning is a brief statement of the hazardous effects of the chemical (“flammable, causes lung damage”). Labels frequently contain other information, such as precautionary measures (“do not use near open flame”), but this information is provided voluntarily and is not required by the subchapter. Labels must be legible, and prominently displayed. There are no specific requirements for size or color, or any specified text.

With these requirements in mind, the compliance officer will be looking for the following types of information to ensure that labeling will be properly implemented in your facility:

1. Designation of person(s) responsible for ensuring labeling of in- plant containers;
2. Designation of person(s) responsible for ensuring labeling of any shipped containers;
3. Description of labeling system(s) used;
4. Description of written alternatives to labeling of in-plant containers (if used); and
5. Procedures to review and update label information when necessary.

Employers that are purchasing and using hazardous chemicals—rather than producing or distributing them—will primarily be concerned with ensuring that every purchased container is labeled. If materials are transferred into other containers, the employer must ensure that these are labeled as well, unless they fall under the portable container exemption (N.J.A.C 12:100-7.6). In terms of labeling systems, you can simply choose to use the labels provided by your suppliers on the containers. They will generally be verbal text labels, and do not usually include numerical rating systems or symbols that require special training. The most important thing to remember is that this is a continuing duty—all in- plant containers of hazardous chemicals must always be labeled. Therefore, it is important to designate someone to be responsible for ensuring that the labels are maintained as required on the containers in your facility, and that newly purchased materials are checked for labels prior to use.

B. Material Safety Data Sheets.

Chemical manufacturers and importers are required to obtain or develop a material safety data sheet (MSDS) for each hazardous chemical they produce or import. Distributors are responsible for ensuring that their customers are provided a copy of these MSDSs. Employers must have an MSDS for each hazardous chemical, which they use. Employers may rely on the information received from their suppliers. The specific requirements for material safety data sheets are in N.J.A.C. 12:100-7.7. There is no specified format for the MSDS under the rule, although there are specific information requirements. OSHA has developed a nonmandatory format, OSHA Form 174, which may be used by chemical manufacturers and importers to comply with the rule. The MSDS must be in English. You are entitled to receive from your supplier a data sheet that includes all of the information required under the rule. If you do not receive one automatically, you should request one. If you receive one that is obviously inadequate, with, for example, blank spaces that are not completed, you should request an appropriately completed one. If your request for a data sheet or for a corrected data sheet does not produce the information needed, you should contact the Department of Labor and/or the Department of Health and Senior Services for assistance in obtaining the MSDS.

The role of MSDSs under the subchapter is to provide detailed information on each hazardous chemical, including its potential hazardous effects, its physical and chemical characteristics, and recommendations for appropriate protective measures. This information should be useful to you as the employer responsible for designing protective programs, as well as to the workers. If you are not familiar with material safety data sheets and with chemical terminology, you may need to learn to use them yourself. A glossary of MSDS terms may be helpful in this regard. Generally speaking, most employers using hazardous chemicals will primarily be concerned with MSDS information regarding hazardous effects and recommended protective measures. Focus on the sections of the MSDS that are applicable to your situation.

MSDSs must be readily accessible to employees when they are in their work areas during their work shifts. This may be accomplished in many different ways. You must decide what is appropriate for your particular workplace. Some employers keep the MSDSs in a binder in a central location (for example, in the pick-up truck on a construction site). Others, particularly in workplaces with large numbers of chemicals, computerize the information and provide access through terminals. As long as employees can get the information when they need it, any approach may be used. The employees must have access to the MSDSs themselves— simply having a system where the information can be read to them over the phone is only permitted under the mobile worksite provision, N.J.A.C. 12:100-7.7(i), when employees must travel between workplaces during the shift. In this situation, they have access to the MSDSs prior to leaving the primary worksite, and when they return, so the telephone system is simply an emergency arrangement.

In order to ensure that you have a current MSDS for each chemical in the plant as required, and that employee access is provided, the compliance officers will be looking for the following types of information in your written program:

1. Designation of person(s) responsible for obtaining and maintaining the MSDSs;
2. How such sheets are to be maintained in the workplace (for example, in notebooks in the work area(s) or in a computer with terminal access), and how employees can obtain access to them when they are in their work area during the work shift;
3. Procedures to follow when the MSDS is not received at the time of the first shipment;
4. For producers, procedures to update the MSDS when new and significant health information is found; and
5. Description of alternatives to actual data sheets in the workplace, if used.

For employers using hazardous chemicals, the most important aspect of the written program in terms of MSDSs is to ensure that someone is responsible for obtaining and maintaining the MSDSs for every hazardous chemical in the workplace. The list of hazardous chemicals required to be maintained as part of the written program will serve as an inventory. As new chemicals are purchased, the list should be updated. Many companies have found it convenient to include on their purchase orders the name and address of the person designated in their company to receive MSDSs.

C. Employee Information and Training.

Each employee who may be “exposed” to hazardous chemicals when working must be provided information and trained prior to initial assignment to work with a hazardous chemical, and whenever the hazard changes. See N.J.A.C. 12:100-7.8 for specific requirements. Information and training may be done either by individual chemical, or by categories of hazards (such as flammability or carcinogenicity). If there are only a few chemicals in the workplace, then you may want to discuss each one individually. Where there are large numbers of chemicals, or the chemicals change frequently, you will probably want to train generally

based on the hazard categories (for example, flammable liquids, corrosive materials, carcinogens). Employees will have access to the substance- specific information on the labels and MSDSs.

Information and training is a critical part of the hazard communication program. Information regarding hazards and protective measures are provided to workers through written labels and material safety data sheets. However, through effective information and training, workers will learn to read and understand such information, determine how it can be obtained and used in their own workplaces, and understand the risks of exposure to the chemicals in their workplaces as well as the ways to protect themselves. A properly conducted training program will ensure comprehensive and understanding. It is not sufficient to either just read material to the workers, or simply hand them material to read. You want to create a climate where workers feel free to ask questions. This will help you to ensure that the information is understood. You must always remember that the underlying purpose of the HCS is to reduce the incidence of chemical source illnesses and injuries. This will be accomplished by modifying behavior through the provision of hazard information and information about protective measures. If your program works, you and your workers will better understand the chemical hazards within the workplace. The procedures you establish regarding, for example, purchasing, storage, and handling of these chemicals will improve, and thereby reduce the risks posed to employees exposed to the chemical hazards involved. Furthermore, your workers' comprehension will also be increased, and proper work practices will be followed in your workplace.

If you are going to do the training yourself, you will have to understand the material and be prepared to motivate the workers to learn. This is not always an easy task, but the benefits are worth the effort. More information regarding appropriate training can be found in OSHA Publication No. 2254 which contains voluntary training guidelines prepared by OSHA's Training Institute. A copy of this document is available from OSHA's Publications Office at (202) 219-4667. In reviewing your written program with regard to information and training, the following items need to be considered:

1. Designation of person(s) responsible for conducting training;
2. Format of the program to be used (audiovisuals, classroom instruction, etc.);
3. Elements of the training program (should be consistent with the elements in N.J.A.C. 12:100-7.8);

and

4. Procedure to train new employees at the time of their initial assignment to work with a hazardous chemical, and to train employees when a new hazard is introduced into the workplace.

The written program should provide enough details about the employer's plans in this area to assess whether or not a good faith effort is being made to train employees. The Department of Labor and/or the Department of Health and Senior Services does not expect that every worker will be able to recite all of the information about each chemical in the workplace. In general, the most important aspects of training under the HCS are to ensure that employees are aware that they are exposed to hazardous chemicals, that they know how to read and use labels and material safety data sheets, and that, as a consequence of learning this information, they are following the appropriate protective measures established by the employer. PEOSH compliance officers will be talking to employees to determine if they have received training, if they know they were exposed to hazardous chemicals, and if they know where to obtain substance-specific information on labels and MSDSs.

If you already have a training program, you may simply have to supplement it with whatever additional information is required under the HCS. For example, construction employers that are already in compliance with the construction training standard (29 CFR §1926.21) will have little extra training to do.

An employer can provide employees information and training through whatever means are found appropriate and protective. Although there would always have to be some training on-site (such as informing employees of the location and availability of the written program and MSDS5), employee training may be satisfied in part by general training about the requirements of the HCS and about chemical hazards on the job which is provided by, for example, trade associations, unions, colleges, and professional schools. In addition, previous training, education and experience of a worker may relieve the employer of some of the burdens of informing and training that worker. Regardless of the method relied upon, however, the employer is always ultimately responsible for ensuring that employees are adequately trained. If the compliance officer finds that the training is deficient, the employer will be cited for the deficiency regardless of who actually provided the training on behalf of the employer.

D. Other Requirements

In addition to these items, compliance officers will also be asking the following questions in assessing the adequacy of the program:

Does a list of the hazardous chemicals exist in each work area or at a central location?

Are methods the employer will use to inform employees of the hazards of nonroutine tasks outlined?

Are employees informed of the hazards associated with chemicals contained in unlabeled pipes in their work areas?

On multi-employer work sites, has the employer provided other employers with information about labeling systems and precautionary measures where the other employers have employees exposed to the initial employer's chemicals?

Is the written program made available to employees and their designated representatives?

If your program adequately addresses the means of communicating information to employees in your workplace, and provides answers to the basic questions outlined above, it will be found to be in compliance with the rule.

5. Checklist for Compliance.

The following checklist will help to ensure you are in compliance with the rule:

- Read and understood the requirements. _____
- Assigned responsibility for tasks. _____
- Prepared an inventory of chemicals. _____
- Ensured containers are labeled. _____
- Obtained MSDSs for each chemical. _____
- Prepared written program. _____
- Made MSDSs available to workers. _____
- Conducted training of workers. _____
- Established procedures to maintain current program. _____
- Established procedures to evaluate effectiveness. _____

6. Further Assistance.

If you have a question regarding compliance with the Hazard Communication Standard, you should contact:

New Jersey Department of Health and Senior Services
Public Employees Occupational Safety and Health Program
PO Box 360
Trenton, New Jersey 08625-0360
(609) 984-1863
Fax: (609) 984-2779
(www.state.nj.us/health/eoh/peoshweb)
e-mail: peosh@doh.state.nj.us

Or

New Jersey Department of Labor
Division of Public Safety and Occupational Safety and Health
PO Box 386
Trenton, New Jersey 08625-0386
(609) 292-7036
(www.state.nj.us/labor/lse/lspeosh.html)

Free consultation services are also available to assist employers, and information regarding these services can be obtained by contacting the programs listed above.

SUBCHAPTER 17. STANDARDS AND PUBLICATIONS REFERRED TO IN THIS CHAPTER

12:100-17.1 Documents referred to by reference

(a) The full title and edition of each of the standards or publications referred to in this chapter are as follows:

1. ACGHI, Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment (2003 Edition);
2-4 (No change.)
5. IARC, International Agency for Research on Cancer Monographs;
Recodify existing 5.-19. as 6-20. (No change in text.)
21. N.J.S.A. 34:6A-25 et seq., New Jersey Public Employees Occupational Safety and Health Act;
22. N.J.S.A. 34:13A- 1 et seq., Employer-Employee Relations Act; and
23. NTP, National Toxicology Program Annual Report on Carcinogens (10th Edition).

12:100-17.3 Availability of documents from issuing organization

Copies of the standards and publications referred to in this chapter may be obtained from the organizations listed below. The abbreviations preceding these standards and publications have the following meaning, and are the organizations issuing the standards and publications listed in N.J.A.C. 12:100-17.1:

ACGIH American Conference of Governmental Industrial Hygienists
1330 Kemper Meadow Drive
Cincinnati, OH 45240

ANSI American National Standards Institute
25 West 43rd Street
New York, New York 10036

CFR Code of Federal Regulations
Copies available from:
Superintendent of Documents
Government Printing Office
Washington, DC 20402 or

U.S. Government Printing Office
Government Book Store
Robert Morris Building
100 North 17th Street
Philadelphia, PA
Phone: (215) 636-1900

CGA Compressed Gas Association Inc.
1235 Jefferson Davis Highway, Suite 509
Arlington, VA 22202

IARC International Agency for Research on Cancer
World Health Organization
150 Cours Albert Thomas
69372 Lyon CEDEX 08
France

NFPA National Fire Protection Association
Batterymarch Park
Quincy, MA 02269

NIOSH National Institute of Occupational Safety and Health
Division of Technical Services
Cincinnati, Ohio 45226

NJAC New Jersey Administrative Code
Copies available from:
Office of Public Employee Safety
N.J. Department of Labor
P0 Box 386
Trenton, NJ 08625-0386

NJSA New Jersey Statutes Annotated
Copies available from:
Public Safety and Occupational Safety and Health
New Jersey Department of Labor
P0 Box 386
Trenton NJ 08625-0386

NTP National Toxicology Program
US Department of Health and Human Services
National Institutes of Health Sciences
Research Triangle Park, NC 27709

Appendix B

PEOSH Hazard Communication Standard Summary of Amendments

Public employers are now required to comply with both the PEOSH Hazard Communication Standard (HCS) and the New Jersey Worker and Community Right to Know (RTK) Act. All of the requirements of the RTK Act, with the exception of the education and training requirements, continue to be in effect and are administered through the New Jersey Department of Health and Senior Services Right to Know Program.

Public employee training requirements will now be solely enforced by the PEOSH Program under the PEOSH HCS, N.J.A.C. 12:100-7, which was adopted by the New Jersey Department of Labor on May 3, 2004. Certain provisions of RTK education and training have been added to the federal Hazard Communication Standard to create the PEOSH HCS. These amendments are summarized below.

- A. New definitions: N.J.A.C. 12:100-7.3
 - ◆ Hazardous Substance Fact Sheet (HSFS)
 - ◆ RTK Hazardous Substance List (RTK HSL)
 - ◆ RTK Survey
 - ◆ Technically Qualified Person
 - ◆ Workplace Hazardous Substance List
 - ◆ Workplace Survey

- B. New requirements added: N.J.A.C. 12:100-7.8
 - ◆ Training records must be maintained and made available
 - ◆ A list of the items to be included in the training records
 - ◆ Refresher training must be provided every two years
 - ◆ A “technically qualified person” must be used to conduct training
 - ◆ Information about applicable provisions of the RTK Act including the RTK Survey, RTK labeling, HSFS, RTK HSL, RTK Central File, and RTK poster must be provided during employee training
 - ◆ Copies of the RTK brochure must be provided during training
 - ◆ Chemical specific information must be made available through HSFSs
 - ◆ Employees shall be informed of the location and availability of HSFSs, the RTK Survey, and the RTK HSL
 - ◆ Training must be provided at no cost to employees, during regular working hours, and in a manner appropriate in content and vocabulary to the educational level, literacy, and language of the employee being trained.

Appendix C

Worksheet for Hazardous Chemical List

Name of Employer: _____

Name of Facility: _____

Date Prepared: _____

Prepared By: _____

Location: _____

Hazardous Products and Chemicals	For New Product/Chemicals (Date Added to List)	(Optional) Check Yes if on File	
		MSDS	HSFS
Product Name:			
Hazardous Chemical Ingredients:			
Product Name:			
Hazardous Chemical Ingredients:			
Product Name:			
Hazardous Chemical Ingredients:			

Note: Make Copies to List Additional Chemicals and for each location.

Appendix D

Sample Letter Requesting MSDSs

(Date)

(Name)
(Address)

Dear _____:

Please send me an up-to-date copy of your Material Safety Data Sheet (MSDS) for the product(s) listed below. The MSDS is needed for compliance with the New Jersey Public Employees Occupational Safety and Health Act Hazard Communication Standard, N.J.A.C. 12:100-7, which requires employers to obtain and maintain MSDSs for each hazardous product and chemical they use.

Product or Chemical Name and Identifying Information

(1) _____

(3) _____

(2) _____

(4) _____

If this product does not require an MSDS, please notify us in writing to that effect.

Please send the MSDS to:

(Name)
(Title)
(Company)
(Address)

If you have any questions regarding this request, please contact (name and telephone number).

Sincerely,

Public Employer

Appendix E

Hazard Communication Standard Compliance Checklist

(Year)

This checklist is not a requirement of the PEOSH Hazard Communication Standard. It is provided as a means of assisting employers in complying with the Standard. As each component of the Standard is completed, indicate the date it was completed and the initials of the person responsible for its completion. With some modifications, this checklist can also be used to review and update the written program.

	Initials	Date
1. Prepared a written hazard communication program.	_____	_____
2. Established a file for PEOSH HCS documentation.	_____	_____
3. Prepared a list of all hazardous chemicals at the facility.	_____	_____
4. Obtained MSDSs and HSFs for each hazardous chemical used.	_____	_____
5. Put a system in place for labeling hazardous chemicals.	_____	_____
6. Reviewed MSDSs for completeness.	_____	_____
7. MSDSs accessible in each work area.	_____	_____
8. Assigned person to review and update the written program.	_____	_____
9. Developed and presented an initial training program for employees	_____	_____
10. Developed and presented refresher training for employees.	_____	_____
11. Developed a system to notify employees of training.	_____	_____
12. Maintained documentation of employee training.	_____	_____
13. Trainer is technically qualified.	_____	_____
14. Put a system in place to notify subcontractors and their employees of hazards in the workplace.	_____	_____
15. Put a system in place to notify employees of subcontractor hazards.	_____	_____
16. Additional hazard warning system(s) in place. (If applicable.)	_____	_____
17. Updated the list of hazardous chemicals at the facility.	_____	_____

Appendix F

Documentation of Training

Name of Public Employer: _____

Type of Training: (Circle One) Initial Refresher

Trainer: _____

Location of Training: _____

Date of Training: _____

Time of Training: _____

Employee Name	Job Title	Signature	Department
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			

Appendix G

<p style="text-align: center;">OSHA: Occupational Safety and Health Administration U.S. Department of Labor</p>

Access to Employee Exposure and Medical Records. – 29 CFR Part 1910.1020

1910.1020(a)

“Purpose.” The purpose of this section is to provide employees and their designated representatives a right of access to relevant exposure and medical records; and to provide representatives of the Assistant Secretary a right of access to these records in order to fulfill responsibilities under the Occupational Safety and Health Act. Access by employees, their representatives, and the Assistant Secretary is necessary to yield both direct and indirect improvements in the detection, treatment, and prevention of occupational disease. Each employer is responsible for assuring compliance with this section, but the activities involved in complying with the access to medical records provisions can be carried out, on behalf of the employer, by the physician or other health care personnel in charge of employee medical records. Except as expressly provided, nothing in this section is intended to affect existing legal and ethical obligations concerning the maintenance and confidentiality of employee medical information, the duty to disclose information to a patient/employee or any other aspect of the medical-care relationship, or affect existing legal obligations concerning the protection of trade secret information.

1910.1020(b)

“Scope and Application”

1910.1020(b)(1)

This section applies to each general industry, maritime, and construction employer who makes, maintains, contracts for, or has access to employee exposure or medical records, or analyses thereof, pertaining to employees exposed to toxic substances or harmful physical agents.

1910.1020(b)(2)

This section applies to all employee exposure and medical records, and analyses thereof, of such employees, whether or not the records are mandated by specific occupational safety and health standards.

1910.1020(b)(3)

This section applies to all employee exposure and medical records, and analyses thereof, made or maintained in any manner, including on an in-house or contractual (e.g., fee-for service) basis. Each employer shall assure that the preservation and access requirements of this section are complied with regardless of the manner in which records are made or maintained.

1910.1020(c)

“Definitions”

1910.1020(c)(1)

“Access” means the right and opportunity to examine and copy.

1910.1020(c)(2)

“Analysis using exposure or medical records” means any compilation of data or any statistical study based at least in part on information collected from individual employee exposure or medical records or information

collected from health insurance claims records, provided that either the analysis has been reported to the employer or no further work is currently being done by the person responsible for preparing the analysis.

1910.1020(c)(3)

“Designated representative” means any individual or organization to whom an employee gives written authorization to exercise a right of access. For the purpose of access to employee exposure records and analyses using exposure or medical records, a recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

1910.1020(c)(4)

“Employee” means a current employee, a former employee, or an employee being assigned or transferred to work where there will be exposure to toxic substances or harmful physical agents. In the case of a deceased or legally incapacitated employee, the employee’s legal representatives may directly exercise all the employee’s right under this section.

1910.1020(c)(5)

“Employee exposure record” means a record containing any of the following kinds of information:

1910.1020(c)(5)(i)

Environmental (workplace) monitoring or measuring of a toxic substance or harmful physical agent, including personal, area, grab, wipe, or other form of sampling, as well as related collection and analytical methodologies, calculations, and other background data relevant to interpretation of the results obtained;

1910.1020(c)(5)(ii)

Biological monitoring results which directly assess the absorption of a toxic substance or harmful physical agent by body systems (e.g., the level of a chemical in the blood, urine, breath, hair, fingernails, etc.) but not including results which assess the biological effect of a substance or agent or which assess an employee’s use of alcohol or drugs;

1910.1020(c)(5)(iii)

Material safety data sheets indicating that the material may pose a hazard to human health; or

1910.1020(c)(5)(iv)

In the absence of the above, a chemical inventory or any other record which reveals where and when used and the identity (e.g., chemical, common, or trade name) of a toxic substance or harmful physical agent.

1910.1020(c)(6)

“Employee medical record” means a record concerning the health status of an employee which is made or maintained by a physician, nurse, or other health care personnel, or technician, including;

1910.1020(c)(6)(i)(A)

Medical and employment questionnaires or histories (including job description and occupational exposures),

1910.1020(c)(6)(i)(B)

The results of medical examinations (pre-employment, pre-assignment, periodic, or episodic) and laboratory tests (including chest and other X-ray examinations taken for the purpose of establishing a base-line or detecting occupational illnesses and all biological monitoring not defined as an “employee exposure record”),

1910.1020(c)(6)(i)(C)

Medical opinions, diagnoses, progress notes, and recommendations,

1910.1020(c)(6)(i)(D)

First aid records,

1910.1020(c)(6)(i)(E)

Descriptions of treatments and prescriptions, and

1910.1020(c)(6)(i)(F)

Employee medical complaints.

1910.1020(c)(6)(ii)

“Employee medical record” does not include medical information in the form of;

1910.1020(c)(6)(ii)(A)

Physical specimens (e.g., blood or urine samples) which are routinely discarded as a part of normal medical practice, or

1910.1020(c)(ii)(B)

Records concerning health insurance claims if maintained separately from the employer’s medical program and its records, and not accessible to the employer by the employee name or other direct personal identifier (e.g., social security number, payroll number, etc.), or

1910.1020(c)(6)(ii)(C)

Records created solely in preparation for litigation which are privileged from discovery under the applicable rules of procedure or evidence; or

1910.1020(c)(6)(ii)(D)

Records concerning voluntary employee assistance programs (alcohol, drug abuse, or personal counseling programs) if maintained separately from the employer’s medical program and its records.

1910.1020(c)(7)

“Employer” means a current employer, a former employer, or a successor employer.

1910.1020(c)(8)

“Exposure” or “exposed” means that an employee is subjected to a toxic substance or harmful physical agent in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes past exposure and potential (e.g., accidental or possible) exposure, but does not include situations where the employer can demonstrate that the toxic substance or harmful physical agent is not used, handled, stored, generated or present in the workplace in any manner different from typical non-occupational situations.

1910.1020(c)(9)

“Health Professional” means a physician, occupational health nurse, industrial hygienist, toxicologist, or epidemiologist, providing medical or other occupational health services to exposed employees.

1910.1020(c)(10)

“Record” means any item, collection, or grouping of information regardless of the form or process by which it is maintained (e.g., paper document, microfiche, microfilm, X-ray film, or automated data processing).

1910.1020(c)(11)

“Specific chemical identity” means a chemical name, Chemical Abstracts Service (CAS) Registry Number, or any other information that reveals the precise chemical designation of the substance.

1910.1020(c)(12)(i)

“Specific written consent” means a written authorization containing the following:

1910.1020(c)(12)(i)(A)

The name and signature of the employee authorizing the release of medical information.

1910.1020(c)(12)(i)(B)

The date of the written authorization,

1910.1020(c)(12)(i)(C)

The name of the individual or organization that is authorized to release the medical information,

1910.1020(c)(12)(i)(D)

The name of the designated representative (individual or organization) that is authorized to receive the released information,

1910.1020(c)(12)(i)(E)

A general description of the medical information that is authorized to be released,

1910.1020(c)(12)(i)(F)

A general description of the purpose for the release of the medical information, and

1910.1020(c)(12)(i)(G)

A date or condition upon which the written authorization will expire (if less than one year).

1910.1020(c)(12)(ii)

A written authorization does not operate to authorize the release of medical information not in existence on the date of written authorization, unless the release of future information is expressly authorized, and does not operate for more than one year from the date of written authorization.

1910.1020(c)(12)(iii)

A written authorization may be revoked in writing prospectively at any time.

1910.1020(c)(13)

“Toxic substance or harmful physical agent” means any chemical substance, biological agent (bacteria, virus, fungus, etc), or physical stress (noise, heat, cold, vibration, repetitive motion, ionizing and non-ionizing radiation, hypo – or hyperbaric pressure, etc.) which:

1910.1020(c)(13)(i)

Is listed in the latest printed edition of the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS) which is incorporated by reference as specified in Sec. 1910.6; or

1910.1020(c)(13)(ii)

Has yielded positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer; or

1910.1020(c)(13)(iii)

Is the subject of a material safety data sheet kept by or known to the employer indicating that the material may pose a hazard to human health.

1910.1020(c)(14)

“Trade secret” means any confidential formula, pattern, process, device, or information or compilation of information that is used in an employer’s business and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it.

1910.1020(d)

“Preservation of records.”

1910.1020(d)(1)

Unless a specific occupational safety and health standard provides a different period of time, each employer shall assure the preservation and retention of records as follows:

1910.1020(d)(1)(i)

“Employee medical records.” The medical record for each employee shall be preserved and maintained for at least the duration of employment plus thirty (30) years, except that the following types of records need not be retained for any specific period:

1910.1020(d)(1)(i)(A)

Health insurance claims records maintained separately from the employer’s medical program and its records.

1910.1020(d)(1)(i)(B)

First aid records (not including medical histories) of one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, and the like which do not involve medical treatment, loss of consciousness, restriction of work or motion, or transfer to another job, if made on-site by a non-physician and if maintained separately from the employer’s medical program and its records, and

1910.1020(d)(1)(i)(C)

The medical records of employees who have worked for less than (1) year for the employer need not be retained beyond the term of employment if they are provided to the employee upon the termination of employment.

1910.1020(d)(1)(ii)

“Employee exposure records.” Each employee exposure record shall be preserved and maintained for at least thirty (30) years, except that:

1910.1020(d)(1)(ii)(A)

Background data to environmental (workplace) monitoring or measuring, such as laboratory reports and worksheets, need only be retained for one (1) year so long as the sampling results, the collection methodology (sampling plan), a description of the analytical and mathematical methods used, and a summary of other background data relevant to interpretation of the results obtained, are retained for at least thirty (30) years; and

1910.1020(d)(1)(ii)(B)

Material safety data sheets and paragraph (c)(5)(iv) records concerning the identity of a substance or agent need not be retained for any specified period as long as some record of the identity (chemical name if known) of the substance or agent, where it was used, and when it was used to retain for at least thirty (30) years (1); and

Footnote(1) Material safety data sheets must be kept for those chemicals currently in use that are affected by the Hazard Communication Standard in accordance with 29 CFR 1910.1200 (g).

1910.1020(d)(1)(ii)(C)

Biological monitoring results designated as exposure records by specific occupational safety and health standards shall be preserved and maintained as required by the specific standard.

1910.1020(d)(1)(iii)

“Analyses using exposure or medical records.” Each analysis using exposure or medical records shall be preserved and maintained for at least thirty (30) years.

1910.1020(d)(2)

Nothing in this section is intended to mandate the form, manner, or process by which an employer preserves a record so long as the information contained in the record is preserved and retrievable, except that chest X-ray films shall be preserved in their original state.

1910.1020(e)

“Access to records.”

1910.1020(e)(1)

“General”

1910.1020(e)(1)(i)

Whenever an employee or designated representative requests access to a record, the employer shall assure that access is provided in a reasonable time, place, and manner. If the employer cannot reasonably provide access to the record within fifteen (15) working days, the employer shall within fifteen (15) working days apprise the employee or designated representative requesting the record of the reason for the delay and the earliest date when the record can be made available.

1910.1020(e)(1)(ii)

The employer may require of the requester only such information as should be readily known to the requester and which may be necessary to locate or identify the records being requested (e.g. dates and locations where the employee worked during the time period in question).

1910.1020(e)(1)(iii)

Whenever an employee or designated representative requests a copy of a record, the employer shall assure that either:

1910.1020(e)(1)(iii)(A)

A copy of the record is provided without cost to the employee or representative,

1910.1020(e)(1)(iii)(B)

The necessary mechanical copying facilities (e.g., photocopying) are made available without cost to the employee or representative for copying the record, or

1910.1020(e)(1)(iii)(c)

The record is loaned to the employee or representative for a reasonable time to enable a copy to be made.

1910.1020(e)(1)(iv)

In the case of an original X-ray, the employer may restrict access to on-site examination or make other suitable arrangements for the temporary loan of the X-ray.

1910.1020(e)(1)(v)

Whenever a record has been previously provided without cost to an employee or designated representative, the employer may charge reasonable, non-discriminatory administrative costs (i.e., search and copying expenses but not including overhead expenses) for a request by the employee or designated representative for additional copies of the record, except that

1910.1020(e)(1)(v)(A)

An employer shall not charge for an initial request for a copy of new information that has been added to a record which was previously provided; and

1910.1020(e)(1)(v)(B)

An employer shall not charge for an initial request by a recognized or certified collective bargaining agent for a copy of an employee exposure record or an analysis using exposure or medical records.

1910.1020(e)(1)(vi)

Nothing in this section is intended to preclude employees and collective bargaining agents from collectively bargaining to obtain access to information in addition to that available under this section.

1910.1020(e)(2)

“Employee and designated representative access.”

1910.1020(e)(2)(i)

“Employee exposure records.”

1910.1020(e)(2)(i)(A)

Except as limited by paragraph (f) of this section, each employer shall, upon request, assure the access to each employee and designated representative to employee exposure records relevant to the employee. For the purpose of this section, an exposure record relevant to the employee consists of:

1910.1020(e)(2)(i)(A)(1)

A record which measures or monitors the amount of a toxic substance or harmful physical agent to which the employee is or has been exposed.

1910.1020(e)(2)(i)(A)(2)

In the absence of such directly relevant records, such records of other employees with past or present job duties or working conditions related to or similar to those of the employee to the extent necessary to reasonably indicate the amount and nature of the toxic substances or harmful physical agents to which the employee is or has been subjected, and

1910.1020(e)(2)(i)(A)(3)

Exposure records to the extent necessary to reasonably indicate the amount and nature of the toxic substance or harmful physical agents at workplaces or under working conditions to which the employee is being assigned or transferred.

1910.1020(e)(2)(i)(B)

Requests by designated representatives for unconsented access to employee exposure records shall be in writing and shall specify with reasonable particularity:

1910.1020(e)(2)(i)(B)(1)

The record requested to be disclosed; and

1910.1020(e)(2)(i)(B)(2)

The occupational health need for gaining access to these records.

1910.1020(e)(2)(ii)

“Employee medical records”

1910.1020(e)(2)(ii)(A)

Each employer shall, upon request, assure the access of each employee to employee medical records of which the employee is the subject, except as provided in paragraph (e)(2)(ii)(D) of this section.

1910.1020(e)(2)(ii)(B)

Each employer shall, upon request, assure the access of each designated representative to the employee medical records of any employee who has given the designated representative specific written consent. Appendix A to this section contains a sample form which may be used to establish specific written consent for access to employee medical records.

1910.1020(e)(2)(ii)(C)

Whenever access to employee medical records is requested, a physician representing the employer may recommend that the employee or designated representative:

1910.1020(e)(2)(ii)(C)(1)

Consult with the physician for the purposes of reviewing and discussing the records requested,

1910.1020(e)(2)(ii)(C)(2)

Accept a summary of material facts and opinions in lieu of the records requested, or

1910.1020(e)(2)(ii)(C)(3)

Accept release of the requested records only to a physician or other designated representative.

1910.1020(e)(2)(ii)(D)

Whenever an employee requests access to his or her employee medical records, and a physician representing the employer believes that direct employee access to information contained in the records regarding a specific diagnosis of a terminal illness or a psychiatric condition could be detrimental to the employee's health, the employer may inform the employee that access will only be provided to a designated representative of the employee having specific written consent, and deny the employee's request for direct access to this information only. Where a designated representative with specific written consent requests access to information so withheld, the employer shall assure the access of the designated representative to this information, even when it is known that the designated representative will give the information to the employee.

1910.1020(e)(2)(ii)(E)

A physician, nurse, or other responsible health care personnel maintaining employee medical records may delete from requested medical records the identity of a family member, personal friend, or fellow employee who has provided confidential information concerning an employee's health status.

1910.1020(e)(2)(iii)

Analyses using exposure or medical records.

1910.1020(e)(2)(iii)(A)

Each employer shall, upon request, assure the access of each employee and designated representative to each analysis using exposure or medical records concerning the employee's working conditions or workplace.

1910.1020(e)(2)(iii)(B)

Whenever access is requested to an analysis which reports the contents of employee medical records by either direct identifier (name, address, social security number, payroll number, etc.) or by information which could reasonably be used under the circumstances indirectly to identify specific employees (exact age, height, weight, race, sex, date of initial employment, job title, etc.), the employer shall assure that personal identifiers are removed before access is provided. If the employer can demonstrate that removal of personal identifiers from an analysis is not feasible, access to the personally identifiable portions of the analysis need not be provided.

1910.1020(e)(3)

"OSHA access."

1910.1020(e)(3)(i)

Each employer shall, upon request, and without derogation of any rights under the Constitution of the Occupational Safety and Health Act of 1970, 29 U.S.C. 651 "et seq.," that the employer chooses to exercise, assure the prompt access of representatives of the Assistant Secretary of Labor for Occupational Safety and Health to employee exposure and medical records and to analyses using exposure or medical records. Rules of agency practice and procedure governing OSHA access to employee medical records are contained in 29 CFR 1913.10.

1910.1020(e)(3)(ii)

Whenever OSHA seeks access to personally identifiable employee medical information by presenting to the employer a written access order pursuant to 29 CFR 1913.10(d), the employer shall prominently post a copy of the written access order and its accompanying cover letter for at least fifteen (15) working days.

1910.1020(f)

"Trade secrets"

1910.1020(f)(1)

Except as provided in paragraph (f)(2) of this section, nothing in this section precludes an employer from deleting from records requested by a health professional, employee, or designated representative any trade secret data which discloses manufacturing processes, or discloses the percentage of a chemical substance in mixture, as long as the health professional, employee, or designated representative is notified that information has been deleted. Whenever deletion of trade secret information substantially impairs evaluation of the place

where or the time when exposure to a toxic substance or harmful physical agent occurred, the employer shall provide alternative information which is sufficient to permit the requesting party to identify where and when exposure occurred.

1910.1020(f)(2)

The employer may withhold the specific chemical identity, including the chemical name and other specific identification of a toxic substance from a disclosable record provided that:

1910.1020(f)(2)(i)

The claim that the information withheld is a trade secret can be supported;

1910.1020(f)(2)(ii)

All other available information on the properties and effects of the toxic substance is disclosed;

1910.1020(f)(2)(iii)

The employer informs the requesting party that the specific chemical identity is being withheld as a trade secret; and

1910.1020(f)(2)(iv)

The specific chemical identity is made available to health professionals, employees, and designated representatives in accordance with the specific applicable provision of this paragraph.

1910.1020(f)(3)

Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a toxic substance is necessary for emergency or first-aid treatment, the employer shall immediately disclose the specific chemical identity of a trade secret chemical to the treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of paragraphs (f)(4) and (f)(5), as soon as circumstances permit.

1910.1020(f)(4)

In non-emergency situations, an employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under paragraph (f)(2) of this section, to a health professional, employee, or designated representative if:

1910.1020(f)(4)(i)

The request is in writing:

1910.1020(f)(4)(ii)

The request describes with reasonable detail one or more of the following occupational health needs for the information:

1910.1020(f)(4)(ii)(A)

To assess the hazards of the chemicals to which employees will be exposed;

1910.1020(f)(4)(ii)(B)

To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

1910.1020(f)(4)(ii)(C)

To conduct pre-assignment or periodic medical surveillance of exposed employees;

1910.1020(f)(4)(ii)(D)

To provide medical treatment to exposed employees;

1910.1020(f)(4)(ii)(E)

To select or assess appropriate personal protective equipment for exposed employees;

1910.1020(f)(4)(ii)(F)

To design or assess engineering controls or other protective measure for exposed employees; and

1910.1020(f)(4)(ii)(G)

To conduct studies to determine the health effects of exposure.

1910.1020(f)(4)(iii)

The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information would not enable the health professional, employee or designated representative to provide the occupational health services described in paragraph (f)(4)(ii) of this section;

1910.1020(f)(4)(iii)(A)

The properties and effects of the chemical;

1910.1020(f)(4)(iii)(B)

Measures for controlling workers' exposure to the chemical;

1910.1020(f)(4)(iii)(C)

Methods of monitoring and analyzing worker exposure to the chemical; and

1910.1020(f)(4)(iii)(D)

Methods of diagnosing and treating harmful exposures to the chemicals;

1910.1020(f)(4)(iv)

The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and

1910.1020(f)(4)(v)

The health professional, employee, or designated representative and the employer or contractor of the services of the health professional or designated representative agree in a written confidentiality agreement that the health professional, employee or designated representative will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to OSHA, as provided in paragraph (f)(9) of this section, except as authorized by the terms of the agreement or by the employer.

1910.1020(f)(5)

The confidentiality agreement authorized by paragraph (f)(4)(iv) of this section:

1910.1020(f)(5)(i)

May restrict the use of the information to the health purposes indicated in the written statement of need;

1910.1020(f)(5)(ii)

May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable pre-estimate of likely damages; and,

1910.1020(f)(5)(iii)

May not include requirements for the posting of a penalty bond.

1910.1020(f)(6)

Nothing in this section is meant to preclude the parties from pursuing non-contractual remedies to the extent permitted by law.

1910.1020(f)(7)

If the health professional, employee or designated representative receiving the trade secret information decides that there is a need to disclose it to OSHA, the employer who provided the information shall be informed by the health professional prior to, or at the same time as, such disclosure.

1910.1020(f)(8)

If the employer denies a written request for disclosure of a specific chemical identity, the denial must:

1910.1020(f)(8)(i)

Be provided to the health professional, employee or designated representative within thirty days of the request;

1910.1020(f)(8)(ii)

Be in writing;

1910.1020(f)(8)(iii)

Include evidence to support the claim that the specific chemical identity is a trade secret;

1910.1020(f)(8)(iv)

State the specific reasons why the request is being denied; and,

1910.1020(f)(8)(v)

Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific chemical identity.

1910.1020(f)(9)

The health professional, employee, or designated representative whose request for information is denied under paragraph (f)(4) of this section may refer the request and the written denial of the request to OSHA for consideration.

1910.1020(f)(10)

When a health professional, employee, or designated representative refers a denial to OSHA under paragraph (f)(9) of this section, OSHA shall consider the evidence to determine if:

1910.1020(f)(10)(i)

The employer has support the claim that the specific chemical identity is a trade secret;

1910.1020(f)(10)(ii)

The health professional, employee or designated representative has supported the claim that there is a medical or occupational health need for the information; and.

1910.1020(f)(10)(iii)

The health professional, employee or designated representative has demonstrated adequate means to protect the confidentiality.

1910.1020(f)(11)(i)

If OSHA determines that the specific chemical identity requested under paragraph (f)(4) of this section is not a "bona fide" trade secret, or that it is a trade secret but the requesting health professional, employee or designated representatives has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means for complying with the terms of such agreement, the employer will be subject to citation by OSHA.

1910.1020(f)(11)(ii)

If an employer demonstrates to OSHA that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the Assistant Secretary may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health needs are met without an undue risk of harm to the employer.

1910.1020(f)12

Notwithstanding the existence of a trade secret claim, an employer shall, upon request, disclose to the Assistant Secretary any information which this section requires the employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the Assistant Secretary so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

1910.1020(f)13

Nothing in this paragraph shall be construed as requiring the disclosure under any circumstances of process or percentage of mixture information which is a trade secret.

1910.1020(g)

“Employee information.”

1910.1020(g)(1)

Upon an employee’s first entering into employment, and at least annually thereafter, each employer shall inform current employees covered by this section of the following:

1910.1020(g)(1)(i)

The existence, location, and availability of any records covered by this section;

1910.1020(g)(1)(ii)

The person responsible for maintaining and providing access to records; and

1910.1020(g)(1)(iii)

Each employee’s rights of access to these records.

1910.1020(g)(2)

Each employer shall keep a copy of this section and its appendices, and make copies readily available, upon request, to employees. The employer shall also distribute to current employees any information materials concerning this section which are made available to the employer by the Assistant Secretary of Labor for Occupational Safety and Health.

1910.1020(h)

“Transfer of records”

1910.1020(h)(1)

Whenever an employer is ceasing to do business, the employer shall transfer all records subject to this section to the successor employer. The successor employer shall receive and maintain these records.

1910.1020(h)(2)

Whenever an employer is ceasing to do business and there is no successor employer to receive and maintain the records subject to this standard, the employer shall notify affected current employees of their rights of access to records at least three (3) months prior to the cessation of the employer’s business.

1910.1020(h)(3)

Whenever an employer either is ceasing to do business and there is no successor employer to receive and maintain the records, or intends to dispose of any records required to be preserved for at least thirty (30) years, the employer shall:

1910.1020(h)(3)(i)

Transfer the records to the Director of the National Institute for Occupational Safety and Health (NIOSH) if so required by a specific occupational safety and health standard; or

1910.1020(h)(3)(ii)

Notify the Director of NIOSH in writing of the impending disposal of records at least three (3) months prior to the disposal of the records.

1910.1020(h)(4)

Where an employer regularly disposes of records required to be preserved for at least thirty (30) years, the employer may, with at least (3) months notice, notify the Director of NIOSH on an annual basis of the records intended to be disposed of in the coming year.

1910.1020(i)

“Appendices.” The information contained in appendices A and B to this section is not intended, by itself, to create any additional obligations not otherwise imposed by this section nor detract from any existing obligation.

[61 FR5507, Feb. 13, 1996; 61 FR 9227, March 7, 1996; 61 FR 31427, June 20, 1996]

29 CFR 1910.1020 App A

Sample authorization letter for the release of employee medical record information to a designated representative (non-mandatory).

I, _____ (full name of worker/patient) hereby authorize _____ (individual or organization holding the medical records) to release to _____ (individual or organization authorized to receive the medical information), the following medical information from my personal medical records:

(Describe generally the information desired to be released).

I give my permission for this medical information to be used for the following purpose:

but I do not give permission for any other use or re-disclosure of this information.

(Note: Several extra lines are provided below so that you can place additional restrictions on this authorization letter if you want to. You may, however, leave these lines blank. On the other hand, you may want to (1) specify a particular expiration date for this letter (if less than one year); (2) describe medical information to be created in the future that you intended to be covered by this authorization letter; or (3) describe portions of the medical information in your records which you do not intend to be released as a result of this letter.)

Full name of Employee or Legal Representative

Signature of Employee or Legal Representative

Date of Signature

[61 FR 31427, June 20, 1996]

Appendix H

<p style="text-align: center;">OSHA: Occupational Safety and Health Administration U.S. Department of Labor</p>

Occupational Exposure to Hazardous Chemicals in Laboratories – 29 CFR Part 1910.1450

1910.1450(a)

Scope and application.

1910.1450(a)(1)

This section shall apply to all employers engaged in the laboratory use of hazardous chemicals as defined below.

1910.1450(a)(2)

Where this section applies, it shall supersede, for laboratories, the requirements of all other OSHA health standards in 29 CFR part 1910, subpart Z, except as follows:

1910.1450(a)(2)(i)

For any OSHA health standard, only the requirement to limit employee exposure to the specific permissible exposure limit shall apply for laboratories, unless that particular standard states otherwise or unless the conditions of paragraph (a)(2)(iii) of this section apply.

1910.1450(a)(2)(ii)

Prohibition of eye and skin contact where specified by any OSHA health standard shall be observed.

1910.1450(a)(2)(iii)

Where the action level (or in the absence of an action level, the permissible exposure limit) is routinely exceeded for an OSHA regulated substance with exposure monitoring and medical surveillance requirements paragraphs (d) and (g)(1)(ii) of this section shall apply.

1910.1450(a)(3)

This section shall not apply to:

..1910.1450(a)(3)(i)

1910.1450(a)(3)(i)

Uses of hazardous chemicals which do not meet the definition of laboratory use, and in such cases, the employer shall comply with the relevant standard in 29 CFR part 1910, subpart Z, even if such use occurs in a laboratory.

1910.1450(a)(3)(ii)

Laboratory uses of hazardous chemicals which provide no potential for employee exposure. Examples of such conditions might include:

1910.1450(a)(3)(ii)(A)

Procedures using chemically-impregnated test media such as Dip-and-Read tests where a reagent strip is dipped into the specimen to be tested and the results are interpreted by comparing the color reaction to a color chart supplied by the manufacturer of the test strip; and

1910.1450(a)(3)(ii)(B)

Commercially prepared kits such as those used in performing pregnancy tests in which all of the reagents needed to conduct the test are contained in the kit.

1910.1450(b)

Definitions --

Action level means a concentration designated in 29 CFR part 1910 for a specific substance, calculated as an eight (8)-hour time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance.

Assistant Secretary means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or designee.

Carcinogen (see select carcinogen)

Chemical Hygiene Officer means an employee who is designated by the employer, and who is qualified by training or experience, to provide technical guidance in the development and implementation of the provisions of the Chemical Hygiene Plan. This definition is not intended to place limitations on the position description or job classification that the designated individual shall hold within the employer's organizational structure.

Chemical Hygiene Plan means a written program developed and implemented by the employer which sets forth procedures, equipment, personal protective equipment and work practices that (i) are capable of protecting employees from the health hazards presented by hazardous chemicals used in that particular workplace and (ii) meets the requirements of paragraph (e) of this section.

Combustible liquid means any liquid having a flashpoint at or above 100 deg. F (37.8 deg. C), but below 200 deg. F (93.3 deg. C), except any mixture having components with flashpoints of 200 deg. F (93.3 deg. C), or higher, the total volume of which make up 99 percent or more of the total volume of the mixture.

Compressed gas means:

- (i) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70 deg. F (21.1 deg. C); or
- (ii) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130 deg. F (54.4 deg. C) regardless of the pressure at 70 deg. F (21.1 deg. C); or
- (iii) A liquid having a vapor pressure exceeding 40 psi at 100 deg. F (37.8 C) as determined by ASTM D-323-72.

Designated area means an area which may be used for work with "select carcinogens," reproductive toxins or substances which have a high degree of acute toxicity. A designated area may be the entire laboratory, an area of a laboratory or a device such as a laboratory hood.

Emergency means any occurrence such as, but not limited to, equipment failure, rupture of containers or failure of control equipment which results in an uncontrolled release of a hazardous chemical into the workplace.

Employee means an individual employed in a laboratory workplace who may be exposed to hazardous chemicals in the course of his or her assignments.

Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

Flammable means a chemical that falls into one of the following categories:

- (i) **Aerosol, flammable** means an aerosol that, when tested by the method described in 16 CFR 1500.45, yields a flame protection exceeding 18 inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;
- (ii) **Gas, flammable** means:
 - (A) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of 13 percent by volume or less; or
 - (B) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than 12 percent by volume, regardless of the lower limit.
- (iii) **Liquid, flammable** means any liquid having a flashpoint below 100 deg F (37.8 deg. C), except any mixture having components with flashpoints of 100 deg. C or higher, the total of which make up 99 percent or more of the total volume of the mixture.
- (iv) **Solid, flammable** means a solid, other than a blasting agent or explosive as defined in § 1910.109(a), that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

Flashpoint means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

- (i) Tagliabue Closed Tester (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24 - 1979 (ASTM D 56-79)) - for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100 deg. F (37.8 deg. C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or
- (ii) Pensky-Martens Closed Tester (See American National Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester, Z11.7 - 1979 (ASTM D 93-79)) - for liquids with a viscosity equal to or greater than 45 SUS at 100 deg. F (37.8 deg. C), or that contain suspended solids, or that have a tendency to form a surface film under test; or
- (iii) Setaflash Closed Tester (see American National Standard Method of test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified above.

Hazardous chemical means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic systems, and agents which damage the lungs, skin, eyes, or mucous membranes.

Appendices A and B of the Hazard Communication Standard (29 CFR 1910.1200) provide further guidance in defining the scope of health hazards and determining whether or not a chemical is to be considered hazardous for purposes of this standard.

Laboratory means a facility where the "laboratory use of hazardous chemicals" occurs. It is a workplace where relatively small quantities of hazardous chemicals are used on a non-production basis.

Laboratory scale means work with substances in which the containers used for reactions, transfers, and other handling of substances are designed to be easily and safely manipulated by one person. "Laboratory scale" excludes those workplaces whose function is to produce commercial quantities of materials.

Laboratory-type hood means a device located in a laboratory, enclosure on five sides with a movable sash or fixed partial enclosed on the remaining side; constructed and maintained to draw air from the laboratory and to prevent or minimize the escape of air contaminants into the laboratory; and allows chemical manipulations to be conducted in the enclosure without insertion of any portion of the employee's body other than hands and arms.

Walk-in hoods with adjustable sashes meet the above definition provided that the sashes are adjusted during use so that the airflow and the exhaust of air contaminants are not compromised and employees do not work inside the enclosure during the release of airborne hazardous chemicals.

Laboratory use of hazardous chemicals means handling or use of such chemicals in which all of the following conditions are met:

- (i) Chemical manipulations are carried out on a "laboratory scale;"
- (ii) Multiple chemical procedures or chemicals are used;
- (iii) The procedures involved are not part of a production process, nor in any way simulate a production process; and
- (iv) "Protective laboratory practices and equipment" are available and in common use to minimize the potential for employee exposure to hazardous chemicals.

Medical consultation means a consultation which takes place between an employee and a licensed physician for the purpose of determining what medical examinations or procedures, if any, are appropriate in cases where a significant exposure to a hazardous chemical may have taken place.

Organic peroxide means an organic compound that contains the bivalent -O-O- structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

Oxidizer means a chemical other than a blasting agent or explosive as defined in § 1910.109(a), that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer pyrophoric, unstable (reactive) or water-reactive.

Protective laboratory practices and equipment means those laboratory procedures, practices and equipment accepted by laboratory health and safety experts as effective, or that the employer can show to be effective, in minimizing the potential for employee exposure to hazardous chemicals.

Reproductive toxins means chemicals which affect the reproductive chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).

Select carcinogen means any substance which meets one of the following criteria:

- (i) It is regulated by OSHA as a carcinogen; or

- (ii) It is listed under the category, "known to be carcinogens," in the Annual Report on Carcinogens published by the National Toxicology Program (NTP)(latest edition); or
- (iii) It is listed under Group 1 ("carcinogenic to humans") by the International Agency for Research on Cancer Monographs (IARC) (latest editions); or
- (iv) It is listed in either Group 2A or 2B by IARC or under the category, "reasonably anticipated to be carcinogens" by NTP, and causes statistically significant tumor incidence in experimental animals in accordance with any of the following: criteria:
 - (A) After inhalation exposure of 6-7 hours per day, 5 days per week, for a significant portion of a lifetime to dosages of less than 10 mg/m³;
 - (B) After repeated skin application of less than 300 (mg/kg of body weight) per week; or
 - (C) After oral dosages of less than 50 mg/kg of body weight per day

Unstable (reactive) means a chemical which is the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

Water-reactive means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

1910.1450(c)

Permissible exposure limits. For laboratory uses of OSHA regulated substances, the employer shall assure that laboratory employees' exposures to such substances do not exceed the permissible exposure limits specified in 29 CFR part 1910, subpart Z.

..1910.1450(d)

1910.1450(d)

Employee exposure determination –

1910.1450(d)(1)

Initial monitoring. The employer shall measure the employee's exposure to any substance regulated by a standard which requires monitoring if there is reason to believe that exposure levels for that substance routinely exceed the action level (or in the absence of an action level, the PEL).

1910.1450(d)(2)

Periodic monitoring. If the initial monitoring prescribed by paragraph (d)(1) of this section discloses employee exposure over the action level (or in the absence of an action level, the PEL), the employer shall immediately comply with the exposure monitoring provisions of the relevant standard.

1910.1450(d)(3)

Termination of monitoring. Monitoring may be terminated in accordance with the relevant standard.

1910.1450(d)(4)

Employee notification of monitoring results. The employer shall, within 15 working days after the receipt of any monitoring results, notify the employee of these results in writing either individually or by posting results in an appropriate location that is accessible to employees.

1910.1450(e)

Chemical hygiene plan --General. (Appendix A of this section is non-mandatory but provides guidance to assist employers in the development of the Chemical Hygiene Plan).

1910.1450 (e)(I)

Where hazardous chemicals as defined by this standard are used in the workplace, the employer shall develop and carry out the provisions of a written Chemical Hygiene Plan which is:

1910.1450 (e)(I)(i)

Capable of protecting employees from health hazards associated with hazardous chemicals in that laboratory and

1910.1450 (e)(I)(ii)

Capable of keeping exposures below the limits specified in paragraph (c) of this section.

1910.1450 (e)(2)

The Chemical Hygiene Plan shall be readily available to employees, employee representatives and, upon request, to the Assistant Secretary.

1910.1450 (e)(3)

The Chemical Hygiene Plan shall include each of the following elements and shall indicate specific measures that the employer will take to ensure laboratory employee protection;

1910.1450 (e)(3)(i)

Standard operating procedures relevant to safety and health considerations to be followed when laboratory work involves the use of hazardous chemicals;

1910.1450(e)(3)(ii)

Criteria that the employer will use to determine and implement control measures to reduce employee exposure to hazardous chemicals including engineering controls, the use of personal protective equipment and hygiene practices; particular attention shall be given to the selection of control measures for chemicals that are known to be extremely hazardous;

1910.1450(e)(3)(iii)

A requirement that fume hoods and other protective equipment are functioning properly and specific measures that shall be taken to ensure proper and adequate performance of such equipment;

...1910.450(e)(3)(iv)

1910.1450(e)(3)(iv)

Provisions for employee information and training as prescribed in paragraph (f) of this section;

1910.1450(e)(3)(v)

The circumstances under which a particular laboratory operation, procedure or activity shall require prior approval from the employer or the employer's designee before implementation;

1910.1450(e)(3)(vi)

Provisions for medical consultation and medical examinations in accordance with paragraph (g) of this section;

1910.1450(e)(3)(vii)

Designation of personnel responsible for implementation of the Chemical Hygiene Plan including the assignment of a Chemical Hygiene Officer, and, if appropriate, establishment of a Chemical Hygiene Committee; and

1910.1450(e)(3)(viii)

Provisions for additional employee protection for work with particularly hazardous substances. These include "select carcinogens," reproductive toxins and substances which have a high degree of acute toxicity. Specific consideration shall be given to the following provisions which shall be included where appropriate:

1910.1450(e)(3)(viii)(A)

Establishment of a designated area;

1910.1450(e)(3)(viii)(B)

Use of containment devices such as fume hoods or glove boxes;

1910.1450(e)(3)(viii)(C)

Procedures for safe removal of contaminated waste; and

1910.1450(e)(3)(viii)(D)

Decontamination procedures.

1910.1450(e)(4)

The employer shall review and evaluate the effectiveness of the Chemical Hygiene Plan at least annually and update it as necessary.

1910.1450(f)

Employee information and training.

1910.1450(f)(1)

The employer shall provide employees with information and training to ensure that they are apprised of the hazards of chemicals present in their work area.

1910.1450(f)(2)

Such information shall be provided at the time of an employee's initial assignment to a work area where hazardous chemicals are present and prior to assignments involving new exposure situations. The frequency of refresher information and training shall be determined by the employer.

1910.1450(f)(3)

Information. Employees shall be informed of:

1910.1450(f)(3)(i)

The contents of this standard and its; appendices which shall be made available to employees;

1910.1450(f)(3)(ii)

the location and availability of the employer's Chemical Hygiene Plan;

..1910.1450(f)(3) (iii)

1910.1450(f)(3) (iii)

The permissible exposure limits for OSHA regulated substances or recommended exposure limits for other hazardous chemicals where there is no applicable OSHA standard;

1910.1450(f)(3)(iv)

Signs and symptoms associated with exposures to hazardous chemicals used in the laboratory; and

1910.1450(f)(3)(v)

The location and availability of known reference material on the hazards, safe handling, storage and disposal of hazardous chemicals found in the laboratory including, but not limited to, Material Safety Data Sheets received from the chemical supplier.

1910.1450(f)(4)

Training.

1910.1450(f)(4)(i)

Employee training shall include:

1910.1450(f)(4)(i)(A)

Methods and observations that may be used to detect the presence or release of a hazardous chemical (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);

1910.1450(f)(4)(i)(B)

The physical and health hazards of chemicals in the work area; and

1910.1450(f)(4)(i)(C)

The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used.

1910.1450(f)(4)(ii)

The employee shall be trained on the applicable details of the employer's written Chemical Hygiene Plan.

1910.1450(g)

Medical consultation and medical examinations.

1910.1450(g)(l)

The employer shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary, under the following circumstances:

1910.1450(g)(1)(i)

Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory, the employee shall be provided an opportunity to receive an appropriate medical examination.

1910.1450(g)(1)(ii)

Where exposure monitoring reveals an exposure level routinely above the action level (or in the absence of an action level, the PEL) for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements, medical surveillance shall be established for the affected employee as prescribed by the particular standard.

1910.1450(g)(1)(iii)

Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination.

...1910.1450(g)(2)

1910.1450(g)(2)

All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

1910.1450(g)(3)

Information provided to the physician. The employer shall provide the following information to the Physician:

1910.1450(g)(3)(i)

The identity of the hazardous chemical(s) to which the employee may have been exposed;

1910.1450(g)(3)(ii)

A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and

1910.1450(g)(3)(iii)

A description of the signs and symptoms of exposure that the employee is experiencing, if any.

1910.1450(g)(4)

Physician's written opinion.

1910.1450(g)(4)(i)

For examination or consultation required under this standard, the employer shall obtain a written opinion from the examining physician which shall include the following:

1910.1450(g)(4)(i)(A)

Any recommendation for further medical follow-up;

1910.1450(g)(4)(i)(B)

The results of the medical examination and any associated tests;

1910.1450(g)(4)(i)(C)

Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous workplace; and

1910.1450(g)(4)(i)(D)

A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.

1910.1450(g)(4)(ii)

The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

1910.1450(h)

Hazard identification.

1910.1450(h)(1)

With respect to labels and material safety data sheets:

1910.1450(h)(1)(i)

Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced.

1910.1450(h)(1)(ii)

Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees.

1910.1450(h)(2)

The following provisions shall apply to chemical substances developed in the laboratory:

...1910.1450(h)(2)(i)

1910.1450(h)(2)(i)

If the composition of the chemical substance which is produced exclusively for the laboratory's use is known, the employer shall determine if it is a hazardous chemical as defined in paragraph (b) of this section. If the chemical is determined to be hazardous, the employer shall provide appropriate training as required under paragraph (f) of this section.

1910.1450(h)(2)(ii)

If the chemical produced is a byproduct whose composition is not known, the employer shall assume that the substance is hazardous and shall implement paragraph (e) of this section.

1910.1450(h)(2)(iii)

If the chemical substance is produced for another user outside of the laboratory, the employer shall comply with the Hazard Communication Standard (29 CFR 1910.1200) including the requirements for preparation of material safety data sheet and labeling.

1910.1450(i)

Use of respirators. Where the use of respirators is necessary to maintain exposure below permissible exposure limits, the employer shall provide, at no cost to the employee, the proper respiratory equipment. Respirators shall be selected and used in accordance with the requirements of 29 CFR 1910.134.

1910.1450(j)

Recordkeeping.

1910.1450(j)(1)

The employer shall establish and maintain for each employee an accurate record of any measurements taken to monitor employee exposures and any medical consultation and examinations including tests or written opinions required by this standard.

1910.1450(j)(2)

The employer shall assure that such records are kept, transferred, and made available in accordance with 29 CFR 1910.1020.

1910.1450(k)

Dates --

1910.1450(k)(1)

Effective date. This section shall become effective May 1, 1990.

1910.1450(k)(2)

Start-up dates.

1910.1450(k)(2)(i)

Employers shall have developed and implemented a written Chemical Hygiene Plan no later than January 31, 1991.

1910.1450(k)(2)(ii)

Paragraph (a)(2) of this section shall not take effect until the employer has developed and implemented a written Chemical Hygiene Plan.

1910.1450(l)

Appendices. The information contained in the appendices is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligation.

[55 FR 3327, Jan. 31, 1990; 55 FR ,7967, March, 6, 1990; 55 FR 12777, March 30, 1990; 61 FR 5507, Feb. 13, 1996]

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Occupational Safety & Health Administration

Table of Contents

Foreword

Corresponding Sections of the Standard and This Appendix

A. General Principles

1. Minimize all Chemical Exposures
2. Avoid Underestimation of Risk
3. Provide Adequate Ventilation
4. Institute a Chemical Hygiene Program
5. Observe the PELs and TLVs

B. Responsibilities

1. Chief Executive Officer
2. Supervisor of Administrative Unit
3. Chemical Hygiene Officer
4. Laboratory Supervisor
5. Project Director
6. Laboratory Worker

C. The Laboratory Facility

1. Design
2. Maintenance
3. Usage
4. Ventilation

D. Components of the Chemical Hygiene Plan

1. Basic Rules and Procedures
2. Chemical Procurement, Distribution, and Storage
3. Environmental Monitoring
4. Housekeeping, Maintenance and Inspections

- 5. Medical Program
- 6. Personal Protective Apparel and Equipment
- 7. Records
- 8. Signs and Labels
- 9. Spills and Accidents
- 10. Training and Information
- 11. Waste Disposal
- E. General Procedures for Working With Chemicals
 - 1. General Rules for all Laboratory Work with Chemicals
 - 2. Allergens and Embryotoxins
 - 3. Chemicals of Moderate Chronic or High Acute Toxicity
 - 4. Chemicals of High Chronic Toxicity
 - 5. Animal Work with Chemicals of High Chronic Toxicity
- F. Safety Recommendations
- G. Material Safety Data Sheets

Foreword

As guidance for each employer's development of an appropriate laboratory Chemical Hygiene Plan, the following non-mandatory recommendations are provided. They were extracted from "Prudent Practices" for Handling Hazardous Chemicals in Laboratories" (referred to below as "Prudent Practices"), which was published in 1981 by the National Research Council and is available from the National Academy Press, 2101 Constitution Ave., NW., Washington DC 20418.

"Prudent Practices" is cited because of its wide distribution and acceptance and because of its preparation by members of the laboratory community through the sponsorship of the National Research Council. However, none of the recommendations given here will modify any requirements of the laboratory standard. This Appendix merely presents pertinent recommendations from "Prudent Practices", organized into a form convenient for quick reference during operation of a laboratory facility and during development and application of a Chemical Hygiene Plan. Users of this appendix should consult "Prudent Practices" for a more extended presentation and justification for each recommendation.

"Prudent Practices" deal with both safety and chemical hazards while the laboratory standard is concerned primarily with chemical hazards. Therefore, only those recommendations directed primarily toward control of toxic exposures are cited in this appendix, with the term "chemical hygiene" being substituted for the word "safety". However, since conditions producing or threatening physical injury often pose toxic risks as well, page references concerning major categories of safety hazards in the laboratory are given in section F.

The recommendations from "Prudent Practices" have been paraphrased, combined, or otherwise reorganized, and headings have been added. However, their sense has not been changed.

Corresponding Sections of the Standard and this Appendix

The following table is given for the convenience of those who are developing a Chemical Hygiene Plan which will satisfy the requirements of paragraph (e) of the standard. It indicates those sections of this appendix which are most pertinent to each of the sections of paragraph (e) and related paragraphs.

Paragraph and topic in laboratory standard	Relevant Appendix Selection
(e)(3)(i) Standard operating procedures for handling toxic chemicals	C, D, E
(e)(3)(ii) Criteria to be used for implementation of measures to reduce exposures.	D
(e)(3)(iii) Fume hood performance	C4b
(e)(3)(iv) Employee information and training (including emergency procedures)	D10, D9
(e)(3)(v) Requirements for prior approval of laboratory activities	E2b, E4b
(e)(3)(vi) Medical consultation and medical examinations.	D5, E4f
(e)(3)(vii) Chemical hygiene responsibilities	B
(e)(3)(viii) Special precautions for work with particularly hazardous substances	E2, E3, E4

In this appendix, those recommendations directed primarily at administrators and supervisors are given in sections A-D. Those recommendations of primary concern to employees who are actually handling laboratory chemicals are given in section E. (Reference to page numbers in "Prudent Practices" are given in parentheses.)

A. General Principles for Work with Laboratory Chemicals

In addition to the more detailed recommendations listed below in sections B-E, "Prudent Practices" expresses certain general principles, including the following:

1. It is prudent to minimize all chemical exposures. Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals should be adopted, rather than specific guidelines for particular chemicals (2,10). Skin contact with chemicals should be avoided as a cardinal rule (198).
2. Avoid underestimation of risk. Even for substances of no known significant hazard, exposure should be minimized; for work with substances which present special hazards, special precautions should be taken (10, 37, 38). One should assume that any mixture will be more toxic than its most toxic component (30, 103) and that all substances of unknown toxicity are toxic (3, 34).
3. Provide adequate ventilation. The best way to prevent exposure to airborne substances is to prevent their escape into the working atmosphere by use of hoods and other ventilation devices (32, 198).
4. Institute a chemical hygiene program. A mandatory chemical hygiene program designed to minimize exposures is needed; it should be a regular, continuing effort, not merely a standby or short-term activity (6,11). Its recommendations should be followed in academic teaching laboratories as well as by full-time laboratory workers (13).
5. Observe the PELs, TLVs. The Permissible Exposure Limits of OSHA and the Threshold Limit Values of the American Conference of Governmental Industrial Hygienists should not be exceeded (13).

B. Chemical Hygiene Responsibilities

Responsibility for chemical hygiene rests at all levels (6, 11, 21) including the:

1. Chief executive officer, who has ultimate responsibility for chemical hygiene within the institution and must, with other administrators, provide continuing support for institutional chemical hygiene (7, 11).

2. Supervisor of the department or other administrative unit, who is responsible for chemical hygiene in that unit (7).

3. Chemical hygiene officer(s), whose appointment is essential (7) and who must:

(a) Work with administrators and other employees to develop and implement appropriate chemical hygiene policies and practices (7);

(b) Monitor procurement, use, and disposal of chemicals used in the lab (8);

(c) See that appropriate audits are maintained (8);

(d) Help project directors develop precautions and adequate facilities (10);

(e) Know the current legal requirements concerning regulated substances (50); and

(f) Seek ways to improve the chemical hygiene program (8, 11).

4. Laboratory supervisor, who has overall responsibility for chemical hygiene in the laboratory (21) including responsibility to:

(a) Ensure that workers know and follow the chemical hygiene rules, that protective equipment is available and in working order, and that appropriate training has been provided (21, 22);

(b) Provide regular, formal chemical hygiene and housekeeping inspections including routine inspections of emergency equipment (21, 171);

(c) Know the current legal requirements concerning regulated substances (50, 231);

(d) Determine the required levels of protective apparel and equipment (156, 160, 162); and

(e) Ensure that facilities and training for use of any material being ordered are adequate (215).

5. Project director or director of other specific operation, who has primary responsibility for chemical hygiene procedures for that operation (7).

6. Laboratory worker, who is responsible for:

(a) Planning and conducting each operation in accordance with the institutional chemical hygiene procedures (7, 21, 22, 230); and

(b) Developing good personal chemical hygiene habits (22).

C. The Laboratory Facility

1. Design. The laboratory facility should have:

(a) An appropriate general ventilation system (see C4 below) with air intakes and exhausts located so as to avoid intake of contaminated air (194);

(b) Adequate, well-ventilated stockrooms/storerooms (218, 219).

(c) Laboratory hoods and sinks (12, 162);

(d) Other safety equipment including eyewash fountains and drench showers (162, 169); and

(e) Arrangements for waste disposal (12, 240).

2. Maintenance. Chemical-hygiene-related equipment (hoods, incinerator, etc.) should undergo continual appraisal and be modified if inadequate (11, 12).

3. Usage. The work conducted (10) and its scale (12) must be appropriate to the physical facilities available and, especially, to the quality of ventilation (13).

4. Ventilation - (a) General laboratory ventilation. This system should: Provide a source of air for breathing and for input to local ventilation devices (199); it should not be relied on for protection from toxic substances released into the laboratory (198); ensure that laboratory air is continually replaced, preventing increase of air concentrations of toxic substances during the working day (194); direct air flow into the laboratory from non-laboratory areas and out to the exterior of the building (194).

(b) Hoods. A laboratory hood with 2.5 linear feet of hood space per person should be provided for every 2 workers if they spend most of their time working with chemicals (199); each hood should have a continuous monitoring device to allow convenient confirmation of adequate hood performance before use (200, 209). If this is not possible, work with substances of unknown toxicity should be avoided (13) or other types of local ventilation devices should be provided (199). See pp. 201-206 for a discussion of hood design, construction, and evaluation.

(c) Other local ventilation devices. Ventilated storage cabinets, canopy hoods, snorkels, etc. should be provided as needed (199). Each canopy hood and snorkel should have a separate exhaust duct (207).

(d) Special ventilation areas. Exhaust air from glove boxes and isolation rooms should be passed through scrubbers or other treatment before release into the regular exhaust system (208). Cold rooms and warm rooms should have provisions for rapid escape and for escape in the event of electrical failure (209).

(e) Modifications. Any alteration of the ventilation system should be made only if thorough testing indicates that worker protection from airborne toxic substances will continue to be adequate (12, 193, 204).

(f) Performance. Rate: 4-12 room air changes/hour is normally adequate general ventilation if local exhaust systems such as hoods are used as the primary method of control (194).

(g) Quality. General air flow should not be turbulent and should be relatively uniform throughout the laboratory, with no high velocity or static areas (194, 195); airflow into and within the hood should not be excessively turbulent (200); hood face velocity should be adequate (typically 60-100 fpm) (200, 204).

(h) Evaluation. Quality and quantity of ventilation should be evaluated on installation (202), regularly monitored (at least every 3 months) (6, 12, 14, 195), and reevaluated whenever a change in local ventilation devices is made (12, 195, 207). See pp 195-198 for methods of evaluation and for calculation of estimated airborne contaminant concentrations.

D. Components of the Chemical Hygiene Plan

1. Basic Rules and Procedures (Recommendations for these are given in section E, below)

2. Chemical Procurement, Distribution, and Storage

(a) Procurement. Before a substance is received, information on proper handling, storage, and disposal should be known to those who will be involved (215, 216). No container should be accepted without an adequate identifying label (216). Preferably, all substances should be received in a central location (216).

(b) Stockrooms/storerooms. Toxic substances should be segregated in a well-identified area with local exhaust ventilation (221). Chemicals which are highly toxic (227) or other chemicals whose containers have been opened should be in unbreakable secondary containers (219). Stored chemicals should be examined periodically (at least annually) for replacement, deterioration, and container integrity (218-19).

Stockrooms/storerooms should not be used as preparation or repackaging areas, should be open during normal working hours, and should be controlled by one person (219).

(c) Distribution. When chemicals are hand carried, the container should be placed in an outside container or bucket. Freight-only elevators should be used if possible (223).

(d) Laboratory storage. Amounts permitted should be as small as practical. Storage on bench tops and in hoods is inadvisable. Exposure to heat or direct sunlight should be avoided. Periodic inventories should be conducted, with unneeded items being discarded or returned to the storeroom/stockroom (225-6, 229).

3. Environmental Monitoring

Regular instrumental monitoring of airborne concentrations is not usually justified or practical in laboratories but may be appropriate when testing or redesigning hoods or other ventilation devices (12) or when a highly toxic substance is stored or used regularly (e.g., 3 times/week) (13).

4. Housekeeping, Maintenance, and Inspections

(a) Cleaning. Floors should be cleaned regularly (24).

(b) Inspections. Formal housekeeping and chemical hygiene inspections should be held at least quarterly (6, 21) for units which have frequent personnel changes and semiannually for others; informal inspections should be continual (21).

(c) Maintenance. Eye wash fountains should be inspected at intervals of not less than 3 months (6). Respirators for routine use should be inspected periodically by the laboratory supervisor (169). Other safety equipment should be inspected regularly. (e.g., every 3-6 months) (6, 24, 171). Procedures to prevent restarting of out-of-service equipment should be established (25).

(d) Passageways. Stairways and hallways should not be used as storage areas (24). Access to exits, emergency equipment, and utility controls should never be blocked (24).

5. Medical Program

(a) Compliance with regulations. Regular medical surveillance should be established to the extent required by regulations (12).

(b) Routine surveillance. Anyone whose work involves regular and frequent handling of toxicologically significant quantities of a chemical should consult a qualified physician to determine on an individual basis whether a regular schedule of medical surveillance is desirable (11, 50).

(c) First aid. Personnel trained in first aid should be available during working hours and an emergency room with medical personnel should be nearby (173). See pp. 176-178 for description of some emergency first aid procedures.

6. Protective Apparel and Equipment

These should include for each laboratory:

- (a) Protective apparel compatible with the required degree of protection for substances being handled (158-161);
- (b) An easily accessible drench-type safety shower (162, 169);
- (c) An eyewash fountain (162)
- (d) A fire extinguisher (162-164);
- (e) Respiratory protection (164-9), fire alarm and telephone for emergency use (162) should be available nearby; and
- (f) Other items designated by the laboratory supervisor (156, 160).

7. Records

- (a) Accident records should be written and retained (174).
- (b) Chemical Hygiene Plan records should document that the facilities and precautions were compatible with current knowledge and regulations (7).
- (c) Inventory and usage records for high-risk substances should be kept as specified in sections E3e below.
- (d) Medical records should be retained by the institution in accordance with the requirements of state and federal regulations (12).

8. Signs and Labels

Prominent signs and labels of the following types should be posted:

- (a) Emergency telephone numbers of emergency personnel/facilities, supervisors, and laboratory workers (28);
- (b) Identity labels, showing contents of containers (including waste receptacles) and associated hazards (27, 48);
- (c) Location signs for safety showers, eyewash stations, other safety and first aid equipment, exits (27) and areas where food and beverage consumption and storage are permitted (24); and
- (d) Warnings at areas or equipment where special or unusual hazards exist (27).

9. Spills and Accidents

- (a) A written emergency plan should be established and communicated to all personnel; it should include procedures for ventilation failure (200), evacuation, medical care, reporting, and drills (172).
- (b) There should be an alarm system to alert people in all parts of the facility including isolation areas such as cold rooms (172).
- (c) A spill control policy should be developed and should include consideration of prevention, containment, cleanup, and reporting (175).

(d) All accidents or near accidents should be carefully analyzed with the results distributed to all who might benefit (8, 28).

10. Information and Training Program

(a) Aim: To assure that all individuals at risk are adequately informed about the work in the laboratory, its risks, and what to do if an accident occurs (5, 15).

(b) Emergency and Personal Protection Training: Every laboratory worker should know the location and proper use of available protective apparel and equipment (154, 169).

Some of the full-time personnel of the laboratory should be trained in the proper use of emergency equipment and procedures (6).

Such training as well as first aid instruction should be available to (154) and encouraged for (176) everyone who might need it.

(c) Receiving and stockroom/storeroom personnel should know about hazards, handling equipment, protective apparel, and relevant regulations (217).

(d) Frequency of Training: The training and education program should be a regular, continuing activity - not simply an annual presentation (15).

(e) Literature/Consultation: Literature and consulting advice concerning chemical hygiene should be readily available to laboratory personnel, who should be encouraged to use these information resources (14).

11. Waste Disposal Program.

(a) Aim: To assure that minimal harm to people, other organisms, and the environment will result from the disposal of waste laboratory chemicals (5).

(b) Content (14, 232, 233, 240): The waste disposal program should specify how waste is to be collected, segregated, stored, and transported and include consideration of what materials can be incinerated. Transport from the institution must be in accordance with DOT regulations (244).

(c) Discarding Chemical Stocks: Unlabeled containers of chemicals and solutions should undergo prompt disposal; if partially used, they should not be opened (24, 27).
Before a worker's employment in the laboratory ends, chemicals for which that person was responsible should be discarded or returned to storage (226).

(d) Frequency of Disposal: Waste should be removed from laboratories to a central waste storage area at least once per week and from the central waste storage area at regular intervals (14).

(e) Method of Disposal: Incineration in an environmentally acceptable manner is the most practical disposal method for combustible laboratory waste (14, 238, 241).

Indiscriminate disposal by pouring waste chemicals down the drain (14, 231, 242) or adding them to mixed refuse for landfill burial is unacceptable (14).

Hoods should not be used as a means of disposal for volatile chemicals (40, 200).

Disposal by recycling (233, 243) or chemical decontamination (40, 230) should be used when possible.

E. Basic Rules and Procedures for Working with Chemicals

The Chemical Hygiene Plan should require that laboratory workers know and follow its rules and procedures. In addition to the procedures of the sub programs mentioned above, these should include the rules listed below.

1. General Rules

The following should be used for essentially all laboratory work with chemicals:

(a) Accidents and spills - Eye Contact: Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention (33, 172).

Ingestion: Encourage the victim to drink large amounts of water (178).

Skin Contact: Promptly flush the affected area with water (33, 172, 178) and remove any contaminated clothing (172, 178). If symptoms persist after washing, seek medical attention (33).

Clean-up. Promptly clean up spills, using appropriate protective apparel and equipment and proper disposal (24, 33). See pp. 233-237 for specific clean-up recommendations.

(b) Avoidance of "routine" exposure: Develop and encourage safe habits (23); avoid unnecessary exposure to chemicals by any route (23);

Do not smell or taste chemicals (32). Vent apparatus which may discharge toxic chemicals (vacuum pumps, distillation columns, etc.) into local exhaust devices (199).

Inspect gloves (157) and test glove boxes (208) before use.

Do not allow release of toxic substances in cold rooms and warm rooms, since these have contained recirculated atmospheres (209).

(c) Choice of chemicals: Use only those chemicals for which the quality of the available ventilation system is appropriate (13).

(d) Eating, smoking, etc.: Avoid eating, drinking, smoking, gum chewing, or application of cosmetics in areas where laboratory chemicals are present (22, 24, 32, 40); wash hands before conducting these activities (23, 24).

Avoid storage, handling, or consumption of food or beverages in storage areas, refrigerators, glassware or utensils which are also used for laboratory operations (23, 24, 226).

(e) Equipment and glassware: Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware (25). Use extra care with Dewar flasks and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur (25). Use equipment only for its designed purpose (23, 26).

(f) Exiting: Wash areas of exposed skin well before leaving the laboratory (23).

(g) Horseplay: Avoid practical jokes or other behavior which might confuse, startle or distract another worker (23).

(h) Mouth suction: Do not use mouth suction for pipeting or starting a siphon (23, 32).

(i) Personal apparel: Confine long hair and loose clothing (23, 158). Wear shoes at all times in the laboratory but do not wear sandals, perforated shoes, or sneakers (158).

(j) Personal housekeeping: Keep the work area clean and uncluttered, with chemicals and equipment being properly labeled and stored; clean up the work area on completion of an operation or at the end of each day (24).

(k) Personal protection: Assure that appropriate eye protection (154-156) is worn by all persons, including visitors, where chemicals are stored or handled (22, 23, 33, 154).

Wear appropriate gloves when the potential for contact with toxic materials exists (157); inspect the gloves before each use, wash them before removal, and replace them periodically (157). (A table of resistance to chemicals of common glove materials is given p. 159).

Use appropriate (164-168) respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls (164-5), inspecting the respirator before use (169).

Use any other protective and emergency apparel and equipment as appropriate (22, 157-162).

Avoid use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken (155).

Remove laboratory coats immediately on significant contamination (161).

(l) Planning: Seek information and advice about hazards (7), plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation (22, 23).

(m) Unattended operations: Leave lights on, place an appropriate sign on the door, and provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) to an unattended operation (27, 128).

(n) Use of hood: Use the hood for operations which might result in release of toxic chemical vapors or dust (198-9).

As a rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a TLV of less than 50 ppm (13).

Confirm adequate hood performance before use; keep hood closed at all times except when adjustments within the hood are being made (200); keep materials stored in hoods to a minimum and do not allow them to block vents or air flow (200).

Leave the hood "on" when it is not in active use if toxic substances are stored in it or if it is uncertain whether adequate general laboratory ventilation will be maintained when it is "off" (200).

(o) Vigilance: Be alert to unsafe conditions and see that they are corrected when detected (22).

(p) Waste disposal: Assure that the plan for each laboratory operation includes plans and training for waste disposal (230).

Deposit chemical waste in appropriately labeled receptacles and follow all other waste disposal procedures of the Chemical Hygiene Plan (22, 24).

Do not discharge to the sewer concentrated acids or bases (231); highly toxic, malodorous, or lachrymatory substances (231); or any substances which might interfere with the biological activity of waste water treatment plants, create fire or explosion hazards, cause structural damage or obstruct flow (242).

(q) Working alone: Avoid working alone in a building; do not work alone in a laboratory if the procedures being conducted are hazardous (28).

2. Working with Allergens and Embryotoxins

(a) Allergens (examples: diazomethane, isocyanates, bichromates): Wear suitable gloves to prevent hand contact with allergens or substances of unknown allergenic activity (35).

(b) Embryotoxins (34-5) (examples: organomercurials, lead compounds, formamide): If you are a woman of childbearing age, handle these substances only in a hood whose satisfactory performance has been confirmed, using appropriate protective apparel (especially gloves) to prevent skin contact.

Review each use of these materials with the research supervisor and review continuing uses annually or whenever a procedural change is made.

Store these substances, properly labeled, in an adequately ventilated area in an unbreakable secondary container.

Notify supervisors of all incidents of exposure or spills; consult a qualified physician when appropriate.

3. Work with Chemicals of Moderate Chronic or High Acute Toxicity

Examples: diisopropylfluorophosphate (41), hydrofluoric acid (43), hydrogen cyanide (45).

Supplemental rules to be followed in addition to those mentioned above (Procedure B of "Prudent Practices", pp. 39-41):

(a) Aim: To minimize exposure to these toxic substances by any route using all reasonable precautions (39).

(b) Applicability: These precautions are appropriate for substances with moderate chronic or high acute toxicity used in significant quantities (39).

(c) Location: Use and store these substances only in areas of restricted access with special warning signs (40, 229).

Always use a hood (previously evaluated to confirm adequate performance with a face velocity of at least 60 linear feet per minute) (40) or other containment device for procedures which may result in the generation of aerosols or vapors containing the substance (39); trap released vapors to prevent their discharge with the hood exhaust (40).

(d) Personal protection: Always avoid skin contact by use of gloves and long sleeves (and other protective apparel as appropriate) (39). Always wash hands and arms immediately after working with these materials (40).

(e) Records: Maintain records of the amounts of these materials on hand, amounts used, and the names of the workers involved (40, 229).

(f) Prevention of spills and accidents: Be prepared for accidents and spills (41).

Assure that at least 2 people are present at all times if a compound in use is highly toxic or of unknown toxicity (39).

Store breakable containers of these substances in chemically resistant trays; also work and mount apparatus above such trays or cover work and storage surfaces with removable, absorbent, plastic backed paper (40).

If a major spill occurs outside the hood, evacuate the area; assure that cleanup personnel wear suitable protective apparel and equipment (41).

(g) Waste: Thoroughly decontaminate or incinerate contaminated clothing or shoes (41). If possible, chemically decontaminate by chemical conversion (40).

Store contaminated waste in closed, suitably labeled, impervious containers (for liquids, in glass or plastic bottles half-filled with vermiculite) (40).

4. Work with Chemicals of High Chronic Toxicity

(Examples: dimethylmercury and nickel carbonyl (48), benzo-a-pyrene (51), N-nitrosodiethylamine (54), other human carcinogens or substances with high carcinogenic potency in animals (38).)

Further supplemental rules to be followed, in addition to all these mentioned above, for work with substances of known high chronic toxicity (in quantities above a few milligrams to a few grams, depending on the substance) (47). (Procedure A of "Prudent Practices" pp. 47-50).

(a) Access: Conduct all transfers and work with these substances in a "controlled area": a restricted access hood, glove box, or portion of a lab, designated for use of highly toxic substances, for which all people with access are aware of the substances being used and necessary precautions (48).

(b) Approvals: Prepare a plan for use and disposal of these materials and obtain the approval of the laboratory supervisor (48).

(c) Non-contamination/Decontamination: Protect vacuum pumps against contamination by scrubbers or HEPA filters and vent them into the hood (49). Decontaminate vacuum pumps or other contaminated equipment, including glassware, in the hood before removing them from the controlled area (49, 50).

Decontaminate the controlled area before normal work is resumed there (50).

(d) Exiting: On leaving a controlled area, remove any protective apparel (placing it in an appropriate, labeled container) and thoroughly wash hands, forearms, face, and neck (49).

(e) Housekeeping: Use a wet mop or a vacuum cleaner equipped with a HEPA filter instead of dry sweeping if the toxic substance was a dry powder (50).

(f) Medical surveillance: If using toxicologically significant quantities of such a substance on a regular basis (e.g., 3 times per week), consult a qualified physician concerning desirability of regular medical surveillance (50).

(g) Records: Keep accurate records of the amounts of these substances stored (229) and used, the dates of use, and names of users (48).

(h) Signs and labels: Assure that the controlled area is conspicuously marked with warning and restricted access signs (49) and that all containers of these substances are appropriately labeled with identity and warning labels (48).

(i) Spills: Assure that contingency plans, equipment, and materials to minimize exposures of people and property in case of accident are available (233-4).

(j) Storage: Store containers of these chemicals only in a ventilated, limited access (48, 227, 229) area in appropriately labeled, unbreakable, chemically resistant, secondary containers (48, 229).

(k) Glove boxes: For a negative pressure glove box, ventilation rate must be at least 2 volume changes/hour and pressure at least 0.5 inches of water (48). For a positive pressure glove box, thoroughly check for leaks before each use (49). In either case, trap the exit gases or filter them through a HEPA filter and then release them into the hood (49).

(l) Waste: Use chemical decontamination whenever possible; ensure that containers of contaminated waste (including washings from contaminated flasks) are transferred from the controlled area in a secondary container under the supervision of authorized personnel (49, 50, 233).

5. Animal Work with Chemicals of High Chronic Toxicity

(a) Access: For large scale studies, special facilities with restricted access are preferable (56).

(b) Administration of the toxic substance: When possible, administer the substance by injection or gavage instead of in the diet. If administration is in the diet, use a caging system under negative pressure or under laminar air flow directed toward HEPA filters (56).

(c) Aerosol suppression: Devise procedures which minimize formation and dispersal of contaminated aerosols, including those from food, urine, and feces (e.g., use HEPA filtered vacuum equipment for cleaning, moisten contaminated bedding before removal from the cage, mix diets in closed containers in a hood) (55, 56).

(d) Personal protection: When working in the animal room, wear plastic or rubber gloves, fully buttoned laboratory coat or jumpsuit and, if needed because of incomplete suppression of aerosols, other apparel and equipment (shoe and head coverings, respirator) (56).

(e) Waste disposal: Dispose of contaminated animal tissues and excreta by incineration if the available incinerator can convert the contaminant to non-toxic products (238); otherwise, package the waste appropriately for burial in an EPA-approved site (239).

F. Safety Recommendations

The above recommendations from "Prudent Practices" do not include those which are directed primarily toward prevention of physical injury rather than toxic exposure. However, failure of precautions against injury will often have the secondary effect of causing toxic exposures. Therefore, we list below page references for recommendations concerning some of the major categories of safety hazards which also have implications for chemical hygiene:

1. Corrosive agents: (35-6)

2. Electrically powered laboratory apparatus: (179-92)

3. Fires, explosions: (26, 57-74, 162-64, 174-5, 219-20, 226-7)

4. Low temperature procedures: (26, 88)

5. Pressurized and vacuum operations (including use of compressed gas cylinders): (27, 75-101)

G. Material Safety Data Sheets

Material safety data sheets are presented in "Prudent Practices" for the chemicals listed below. (Asterisks denote that comprehensive material safety data sheets are provided).

- Acetyl peroxide (105)

- Acrolein (106)

- Acrylonitrile

Ammonia (anhydrous)(91)

- Aniline (109)

- Benzene (110)

- Benzo[a]pyrene (112)

- Bis(chloromethyl) ether (113)

Boron trichloride (91)

Boron trifluoride (92)

Bromine (114)

- Tert-butyl hydroperoxide (148)
- Carbon disulfide (116)

Carbon monoxide (92)

- Carbon tetrachloride (118)

*Chlorine (119)

Chlorine trifluoride (94)

- Chloroform (121)

Chloromethane (93)

- Diethyl ether (122)

Diisopropyl fluorophosphate (41)

- Dimethylformamide (123)
- Dimethyl sulfate (125)
- Dioxane (126)
- Ethylene dibromide (128)
- Fluorine (95)
- Formaldehyde (130)
- Hydrazine and salts (132)

Hydrofluoric acid (43)

Hydrogen bromide (98)

Hydrogen chloride (98)

- Hydrogen cyanide (133)
- Hydrogen sulfide (135)

Mercury and compounds (52)

- Methanol (137)
- Morpholine (138)
- Nickel carbonyl (99)
- Nitrobenzene (139)

Nitrogen dioxide (100)

N-nitrosodiethylamine (54)

- Peracetic acid (141)
- Phenol (142)
- Phosgene (143)
- Pyridine (144)
- Sodium azide (145)
- Sodium cyanide (147)

Sulfur dioxide (101)

- Trichloroethylene (149)
- Vinyl chloride (150)

Occupational Safety & Health Administration
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U.S. Department of Labor Occupational Safety & Health Administration
Regulations (Standards - 29 CFR)
References (Non-Mandatory) - 1910.1450 App B

The following references are provided to assist the employer in the development of a Chemical Hygiene Plan. The materials listed below are offered as non-mandatory guidance. References listed here do not imply specific endorsement of a book, opinion, technique, policy or a specific solution for a safety or health problem. Other references not listed here may better meet the needs of a specific laboratory

(a) Materials for the development of the Chemical Hygiene Plan:

1. American Chemical Society, Safety in Academic Chemistry Laboratories, 4th edition, 1985.
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Occupational Safety & Health Administration
200 Constitution Avenue, NW
Washington, DC 20210

APPENDIX DEVELOPMENTAL DISABILITIES VII AWARENESS ACT

Developmental Disabilities Awareness Act

N.J.S.A. 26:2-189. Legislative findings and declarations

The Legislature finds and declares that:

a. Autism is a developmental disorder of brain function which is typically manifested in impaired social interaction, problems with verbal and nonverbal communication and imagination, and unusual or severely limited activities and interests. These symptoms generally appear during the first three years of childhood and continue throughout life.

According to the federal Centers for Disease Control and Prevention, or CDC, one of every 94 children in this State has autism, which is the highest rate among the states examined by the CDC in the most comprehensive study of the prevalence of autism to date;

b. In addition to those diagnosed with autism every year, there are an estimated 4.5 million individuals with intellectual and other developmental disabilities living in the United States, including approximately 200,000 individuals in New Jersey.

Developmental disabilities are a diverse group of severe chronic conditions that are due to mental or physical impairments which are manifested in problems with major life activities such as language, mobility, learning, self-help, and independent living. Developmental disabilities begin anytime during development up to 22 years of age and usually last throughout a person's lifetime.

Intellectual disability is characterized both by a significantly below-average score on a test of mental ability or intelligence and by limitations in the ability to function in areas of daily life, such as communication, self-care, and getting along in social situations and school activities. Intellectual disability is sometimes referred to as a cognitive disability or mental retardation. Intellectual disabilities include, but are not limited to, Down syndrome, fetal alcohol syndrome, fragile X syndrome, Cri-du-chat syndrome, Prader-Willi syndrome, as well as infections such as congenital cytomegalovirus or birth defects that affect the brain such as hydrocephalus or cortical atrophy. Other causes of intellectual disability include serious head injury, stroke or certain infections such as meningitis; and

c. Firefighters, emergency medical technicians, and police officers may unexpectedly encounter or be asked to locate a person diagnosed with autism or an intellectual or other developmental disability. Given the high number of individuals affected by these disabilities, it is altogether fitting and proper to ensure that emergency responders are uniformly trained in recognizing the behavioral symptoms and characteristics of a child or adult with one or more of these disabilities, and are educated in the high risks associated with these disabilities as well as basic response techniques.

N.J.S.A. 26:2-190. Training curriculum for emergency responders; time to complete training

a. The Commissioner of Health and Senior Services and the Commissioner of Human Services, in consultation with the New Jersey Fire and Emergency Medical Services Institute and the New Jersey State First Aid Council, shall develop a training curriculum with the purpose of informing emergency responders of the risks associated with autism or an intellectual or other developmental disability, as well as providing instruction in appropriate recognition and response techniques concerning these disabilities. The curriculum shall be incorporated into existing time requirements for training and continuing education of emergency responders.

b. Prior to certification by the Department of Health and Senior Services, each emergency medical technician trained in basic life support services as defined in section 1 of P.L.1985, c. 351 (C.26:2K-21) shall be required to satisfactorily complete the training developed under subsection a. of this section. Every emergency medical technician certified prior to the effective date of this act shall, within 36 months of the effective date of this act [FN1], satisfactorily complete the training in recognition and response techniques concerning these disabilities, through existing continuing education requirements.

c. The Commissioner of Health and Senior Services shall adopt rules and regulations, pursuant to the “Administrative Procedure Act,” P.L.1968, c. 410 (C.52:14B-1 et seq.), to effectuate the purposes of this act.

N.J.S.A. 52:27D-25jj. Training course in recognition and response techniques to certain intellectual and developmental disabilities

a. The Division of Fire Safety in the Department of Community Affairs, in consultation with the New Jersey Fire and Emergency Medical Services Institute, shall adopt a training course regarding the risks associated with autism or an intellectual or other developmental disability and appropriate recognition and response techniques concerning these disabilities, based on the curriculum developed by the Departments of Health and Senior Services and Human Services pursuant to subsection a. of section 2 of P.L.2008, c. 80 (C.26:2-190). The course curriculum and instruction shall be administered to every firefighter recruit, volunteer or paid.

b. Each person, volunteer or paid, who is engaged in fire suppression, firefighting, or fire rescue before the effective date of this act [FN1] shall, within 36 months of the effective date of this act, satisfactorily complete a training course in recognition and response techniques concerning these disabilities.

c. The Commissioner of Community Affairs shall adopt rules and regulations, pursuant to the “Administrative Procedure Act,” P.L.1968, c. 410 (C.52:14B-1 et seq.), to effectuate the purposes of this act.

N.J.S.A. 52:17B-71.9. Training course in recognition and response techniques to certain intellectual and developmental disabilities

a. The Police Training Commission in the Department of Law and Public Safety shall adopt a training course regarding the risks associated with autism or an intellectual or other developmental disability and appropriate recognition and response techniques concerning these disabilities based on the curriculum developed by the Departments of Health and Senior Services and Human Services pursuant to subsection a. of section 2 of P.L.2008, c. 80 (C.26:2-190). The training course shall be administered by the employing agency as part of the in-service training provided to each local police officer in each law enforcement unit operating in this State.

b. Prior to being appointed to permanent status as a local police officer in a law enforcement unit, an individual shall be required to complete the training course adopted under subsection a. of this section. Every local police officer appointed prior to the effective date of this act shall, within 36 months of the effective date of this act [FN1], satisfactorily complete a training course in recognition and response techniques concerning these disabilities.

c. The Police Training Commission shall adopt rules and regulations, pursuant to the “Administrative Procedure Act,” P.L.1968, c. 410 (C.52:14B-1 et seq.), to effectuate the purposes of this act.