ERTK

Employee **R**ight **t**o **K**now Program

Content adapted from:

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PURPOSE

This program manual is designed to implement the provisions of the Minnesota Employee Right to Know Act of 1983. This manual presents the major aspects of the standards. These standards require employers to evaluate their workplaces for the existence of hazardous substances, harmful physical agents, and infectious agents and to provide training and information to those employees covered under this act who are routinely exposed to those substances and agents.

SCOPE OF THE EMPLOYEE RIGHT TO KNOW PROGRAM

This Employee Right to Know Program has been developed in accordance to applicable state and federal regulations. It has been approved as the City's own right to know program by the appropriate administrative or governing authority identified below. The use of the word "City" shall be construed to mean the municipal city and such other departments of city government for which this program has been adopted.

This Employee Right to Know Program will be reviewed for relevant updates by the Safety Committee every two years.

See Appendix A for Approval and Revision History

Administrative Responsibilities

The following person is responsible for administering the Employee Right to Know Program at the City. This person has the primary responsibility to oversee the ERTK program and ensure that it is organized, implemented and updated as required by the Employee Right to Know Standard.

Program Administrator for City Departments Covered in this program.
Sharon Payne

To ensure an effective Employee Right to Know Program, the following supervisors are responsible for carrying out the details of this program in their work areas.

Supervisor	Department
Tanner Jones	Maintenance
Rod Olson	Stacy Wine & Spirits
John Wicklander	Stacy Sports Grill
Sharon Payne	City Clerk

Hazard Determination

The City recognizes/inventories a list of hazardous substances, harmful physical agents and infectious agents listed in subparts 5206.0400, 5206.0500 and 5206.0700 of the Employee Right to know rules. The City will exercise reasonable diligence in evaluating the workplace for the presence of recognized hazardous substances, harmful physical agents, and infectious agents and assure that employees are provided with the rights stated in the standard. The City understands that the hazardous substances list includes the majority of hazardous substances that will be encountered in Minnesota and that it does not include all hazardous substances and may not always be current. Therefore, the evaluations conducted by the specific manufacturer of the substances used at the City will be accepted and employees provided with the rights stated in the standard.

HAZARDOUS SUBSTANCES

The City has developed an inventory/list of all hazardous substances and the operations where they are used. The intent is to inform employees about the hazardous substances they may encounter in the workplace.

Commented [SP1]: Mark Ness Comment: Each Department Needs to do.

Work area supervisors or delegated employees will update the inventory/list whenever a new hazardous substance is introduced into that work area. Supervisors will report the name of the new hazardous substance and the operation where it will be used to the following individual so that it can be added to the inventory/list before employees in the work area use it.

Each Department Head

The inventory/list of hazardous substance used at the City/Utility is available for review at the following location(s).

Building	Location
Stacy City Hall	Bulletin Board by the Restrooms
Stacy Sports Grill	
Stacy Wine & Spirits	
Maintenance Building	
Treatment Plant	

Hazardous Substance Container Labeling

The following person is responsible for coordinating labeling activities among supervisors and employees to make sure they are uniform and follow the rules of the City.

Tanner Jones

The City understands that the manufacturer of a hazardous substance or mixture of hazardous substances, or of equipment which generates a harmful physical agent is obligated to provide the information necessary for the City to comply with Employee Right to know requirements. Supervisors at the City will evaluate containers arriving in their work area to ensure that the label, tag, or markings meet the following requirements:

1) Identifies the hazardous substance.
2) Appropriate hazard warning(s).
3) Name and address of the chemical manufacturer, importer or other responsible party.

Should a product be received that does not meet the above stated labeling requirements, the supervisors will immediately label, tag, or mark any hazardous substance container at the City so that it:

1) Identifies the hazardous substance and the identity corresponds with the name used on the SDS and inventory list.
2) Indicates the appropriate hazard warning
3) Does not conflict with labels from the Department of Transportation.

Supervisors will also ensure:

1) The label, tag, or marking is legible, in English, and is prominently displayed.

2) The incoming containers of hazardous substance include the manufacturer's name and address.

3) Chemical labels for OSHA specific standards comply with those regulations.

4) The labels on incoming containers of hazardous substances are not removed or defaced unless the container is immediately marked, tagged or labeled with required information.

5) Stationary processes that contain hazardous substances have the appropriate label or alternative warning attached that conveys the required information.

6) Contracted employers working at the facility are notified of the labeling procedure and understand the label (warning) system.

7) The City recognizes labeling that is in compliance with the following regulations meet the requirements of the Employee Right to Know Program:

8) Pesticides labeled in accordance with the Federal Insecticide, Fungicide and Rodenticide Act.

9) Any food, food additive, color additive, drug, or cosmetic including materials intended for use as ingredients in products labeled in accordance with the requirements of the Federal Food, Drug and Cosmetic Act.

10) Distilled spirits (beverages alcohols), wines, or malt beverages labeled in accordance with the Federal Alcohol Administration Act.

11) Any consumer products as defined in the Consumer Product Safety Act and labeled in accordance with the requirements of that act.

12) Any hazardous substance as defined in the Federal Hazardous Substance Act and labeled in accordance with the requirements that act.

In-House Label Explanation and Description

Supervisors will ensure that all secondary containers in the workplace are labeled according the following requirements:

1) Identifies the product and any hazardous substances.
2) Appropriate hazard warning(s).
3) The label, tag, or marking is legible, in English, and is prominently displayed.

The City uses the following label(s) for secondary containers

Commented [SP2]: Mark Ness Comment: ???

Safety Data Sheets (SDS)

The City will obtain and collect the safety data sheets (SDS) for all hazardous substances purchased from manufacturers, importers and distributors of said substances. A current hard copy or an electronic copy will be on file.

Where an in-house process generates hazardous substances, a "generic" SDS of the hazardous substance will be obtained and placed in the City's SDS file. The intent is to provide a "safety data sheet" for all hazardous substances encountered by employees in the workplace.

The following person in responsible for making sure the SDS file at the City's is maintained and updated as necessary:

Commented [SP3]: Mark Ness Comment: Who is the main contact. I think there should be a master list kept at City hall or on the server for all to access.

Department Heads

Supervisors will notify this person prior to the time that a new hazardous substance is used in the workplace so that the appropriate SDS can be obtained.

The SDS file (hard or electronic) at the City is located at the following location(s):

Building	Location
Stacy City Hall	Bulletin Board by the Restroom
Stacy Sports Grill	
Stacy Wine & Spirits	
Maintenance Shop	
Water Treatment Plant	

These files are available to all employees at the SDS file location or for more information contact your immediate supervisor.

HARMFUL PHYSICAL AGENTS

The City recognizes the list of harmful physical agents listed/inventoried below. The City will exercise reasonable diligence in evaluating the workplace for the presence of recognized harmful physical agents at a level that may be expected to approximate or exceed the permissible exposure limit or the applicable action level. The City understands that the list/inventory of harmful physical agents includes the majority of harmful physical agents that will be encountered in Minnesota (or other states). The City will make a diligent effort to ensure that this list is updated as necessary. The City will ensure that exposed employees are afforded their rights as established in the Employee Right to Know rules.

List of Harmful Physical Agents

1) Heat
2) Noise
3) Ionizing Radiation
4) Nonionizing Radiation

Harmful Physical Agent Labeling

The City will ensure that equipment or work areas that specifically generate harmful physical agents at a level that may be expected to approximate or exceed the permissible exposure limit or applicable action will be labeled, marked or tagged. Labeling will include:

1) The name of the physical agent.
2) The appropriate hazard warning.

INFECTIOUS AGENTS

The City recognizes the list of infectious agents listed in Minnesota rule 5260.0600. The City will exercise reasonable diligence in evaluating the workplace for the presence of recognized and other infectious agents. The City understands that the list of infectious agents includes the majority of communicable infectious agents that will be encountered in Minnesota. The City will make a diligent effort to ensure that the most current list is provided in this program. The City will ensure employees whom are routinely exposed are provided with the rights established in the Employee Right to Know rules.

BLOODBORNE PATHOGENS

The City maintains a separate bloodborne pathogens program that complies with the OSHA 1910.1030 regulations. This program covers all reasonably anticipated infectious agent exposures at the City.

EMPLOYEE TRAINING AND INFORMATION

The City provides each employee with information and training about the hazardous substances used in its operations and any exposure to harmful physical agents and/or infectious agents at a level that may be expected to approximate or exceed the permissible exposure limits. Additional employee training will be conducted whenever a new hazardous substance is introduced and/or the work situation changes that may increase the level of exposure to any harmful physical agent or infectious agent. New or transferred employees will receive the appropriate training and information specific to their work assignment, prior to beginning that assignment.

The following person is responsible for coordinating the employee information and training programs at the City.

The City will inform the employees of:

1) The requirements of the Minnesota Employee Right to Know law.

2) The operations where hazardous substances are used including the hazardous substances that are contained in unlabeled pipes.

3) The operations where exposure to harmful physical agents and harmful infectious agents may be expected.

4) The location of the written Employee Right to Know Program, the list/inventory of hazardous substance, and the corresponding material safety data sheets for those substances.

5) The labeling system employed at the City.

The City will train employees routinely exposed to hazardous substances:

Commented [SP4]: Mark Ness Comment: yearly ???

1) The name or names of the substance including any generic or chemical name, trade name, and commonly used name.

2) The level, if any and if known, at which exposure to the substance has been restricted according to standards. If no standard has been adopted, according to guidelines established by competent professional groups, which have conducted research to determine the hazardous properties of potentially hazardous substances.

3) The primary routes of entry and the known acute and chronic effects of exposure at hazardous levels.

4) The known symptoms of the effects.

5) Any potential for flammability, explosion, or reactivity of the substance.

6) Appropriate emergency treatment.

7) The known proper conditions for use of and exposure to the substance.

8) An explanation of the use and limitations of methods of control that will prevent or reduce exposure appropriate engineering controls and work practices, personal protective equipment and housekeeping.

9) An explanation of the basis for selection of personal protective equipment, including information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment.

10) Procedures for cleanup of leaks and spills.

11) The name, phone number, and address of a manufacturer of the hazardous substance.

12) The location of a written copy/electronic (SDS) of the above information

The City will train employees who may be routinely exposed to harmful physical agents. This training will include:

1) The name or names of the physical agent including any commonly used synonym.

2) The level, if any and if know, at which exposure to the physical agent has been restricted according to adopted standards, or, if no standard has been adopted, according to guidelines established by competent professional groups including but not limited to the American Conference of Governmental Industrial Hygienists, the Center for Disease Control, the Bureau of Radiological Health, and the American National Standards Institute.

3) The known acute and chronic effects of exposure at hazardous levels.

4) The known symptoms of exposure at hazardous levels.

5) The appropriate emergency treatment.

6) The known proper conditions for safe use of and exposure to the physical agent.

7) An explanation of the use and limitations of methods of control that will prevent or reduce exposure appropriate engineering controls and work practices, personal protective equipment and housekeeping.

8) An explanation of the basis for selection of personal protective equipment, including information on the types, proper use, limitations and location of personal protective equipment.

9) The name, phone number and address, if appropriate, of the manufacturer of the equipment which generates the harmful physical agent.

10) A written copy of all of the above information which shall be readily accessible in the area or areas in which the harmful physical agent is present and where the employee may be exposed to the agent through use, handling or otherwise.

The City will train employees who may be routinely exposed to infectious agents. This training will include:

1) A general explanation of the epidemiology and symptoms of infectious diseases including the hazards to special at-risk employee groups.

2) An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to infectious agents including blood and other infectious materials.

3) An explanation of the chain of infection, or infectious disease process, including agents, reservoirs, modes of escape from reservoirs, modes of transmission, modes of entry into host, and host susceptibility.

4) An explanation of the employer's exposure control program.

5) An explanation of the use and limitations of methods of control that will prevent or reduce exposure including universal precautions, appropriate engineering controls and work practices, personal protective equipment and housekeeping.

6) An explanation of the basis for selection of personal protective equipment, including information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment.

7) An explanation of the proper procedures for cleanup of blood or body fluids.

8) An explanation of the recommended immunization practices, including, but not limited to, the HBV vaccine, and the efficacy, safety, and benefits of being vaccinated.

9) Procedures to follow if an exposure incident occurs, method of reporting the incident, and information on the post-exposure evaluation and medical follow-up that will be available.

10) Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials.

11) An explanation of the signs, labels, tags, or color-coding used to denote biohazards.

12) The location of the regulatory text of this standard and explanation of its contents.

13) The location and contents of other pertinent information that explain the symptoms and effects of each infectious agent that the employee may be exposed to.

NOTE: The Bloodborne Pathogens Program addresses the aspects set forth in the above stated information.

The City generally schedules employee right to know training in conjunction with monthly safety meetings. Other sessions will be arranged as needed.

Commented [SP5]: Mark Ness Comment: Monthly meetings with employees?

Attendance records and a summary of the items covered in the monthly employee training and information sessions are located at (and may also be found electronically at):

Building	Location
City Hall	Clerk's Office

The following supervisors are responsible for: ensuring that employees for the respective department receive training whenever a new hazardous substance is introduced and/or the work situation changes that may increase the level of exposure to any harmful physical agent or infectious agent; and new or transferred employees receive the appropriate training and information specific to their work assignment, prior to beginning that assignment.

Supervisor	Department
Tanner Jones	Maintenance
Rod Olson	Stacy Wine & Spirits
John Wickland	Stacy Sports Grill
Sharon Payne	Clerks Office

SPECIAL CONSIDERATIONS

Non-Routine and Special Tasks

The program administrator, in cooperation with the above listed supervisors, will review known physical and health hazards with employees who must do non-routine and special tasks. This instruction will generally occur at the time the work is scheduled. However, in an emergency the review may occur immediately before the work begins.

If appropriate, the instruction will include:

1) Identification of the hazardous substance involved.

2) Methods of detecting the presence or release of the substances.

3) Specific physical and health hazards of the substance involved.

4) Measures the employee(s) can take to protect themselves from these hazards such as appropriate work practices, emergency procedures, and proper protective equipment.

5) An opportunity for employees to review the material safety data sheets for any of the hazardous chemicals involved.

CONTRACTORS

Contractors will be notified of the hazardous substances, harmful physical agents and infectious agents they may encounter at the City and the protective measures that can be taken to avoid them.

The following supervisors will complete the "Contractor Notification" form and give it to the contractor prior to the work beginning.

Supervisor	Department
Tanner Jones	Maintenance
Rod Olson	Stacy Wine & Spirits
John Wicklander	Stacy Sports Grill
Sharon Payne	Clerks Office

Contractors are required to notify the City of any hazardous substance brought onto a city work site and shall provide the city with a safety data sheet for each chemical. The department supervisor is responsible for obtaining this information and conveying it to any exposed City employee.

FORMS

Contractor Notification Form

Purpose:
The Minnesota Employee Right to Know law requires that the above named City/Utility notify on-site contractors of the hazardous substances, harmful physical agents and/or infectious agents they may encounter at this work place and the appropriate protective equipment necessary to avoid those hazards. This form is to be completed by the Department Supervisor and given to the contractor prior to starting the contracted work in an effort to meet the intent of that law.

Identification:	
Contractor Name:	
Contractor Phone:	
Contractor Address:	
Project Name:	
Project Location:	
Department Supervisor:	

The hazardous substances used by the City to which the contractors employee may be exposed are listed on the next page.

The safety data sheets for these chemicals can be found at the following locations(s):

Building	Contact Person
City Hall	Sharon Payne
Maintenance	Tanner Jones
Stacy Sports Grill	John Wicklander
Stacy Wine & Spirits	Rod Olson

Acknowledgement of Receipt of this form:

Contractor Date

City Representative Date

Hazardous Substances:

Harmful Substances Harmful Physical Agents Infectious Agents	Measures to take to avoid exposure	Personal Protective Equipment Required (Contractor Responsibility)

Inventory List/Inventory of Hazardous Chemicals:

Department _____

Contact Person _____

Chemical Identity Product Name	Operation Use of Product	MSDS Y/N	Extremely Hazardous Substance Y/N	Hazard Rating		
				H	F	R

APPENDIX A

Approval and Revision History

Revision Date	Approval Date

APPENDIX B Safety Data Sheet Checklist

Each SDS must contain the following information:

- ☐Product or chemical identity used on the label.
- ☐Manufacturer's name and address.
- ☐Chemical and common names of each hazardous ingredient.
- ☐Name, address and phone number for emergency information.
- ☐Preparation or revision date.
- ☐The hazardous chemical's physical and chemical characteristics (such as vapor pressure and flashpoint).
- ☐Physical hazards, including the potential for fire, explosion and reactivity.
- ☐Known health hazards.
- ☐OSHA permissible exposure limits (PEL), ACGIH Threshold Limit Value (TLV) or other exposure limits.
- ☐Emergency and first-aid procedures.
- ☐Whether OSHA, NTP or IARC lists the ingredients as a carcinogen.
- ☐Precautions for safe handling and use.
- ☐Control measures such as engineering controls, work practices or personal protective equipment.
- ☐Primary routes of entry.
- ☐Procedures for spills, leaks and clean-up.

APPENDIX C - Industrial sources of non-ionizing radiation*

Sources	Uses	Comments
Broadcast	AM Radio FM Radio VHF TV UHF TV	535-1605 kHz. 88-108 MHZ 54-72, 76-88, 174-216 MHZ 470-890 MHZ
Cathode-ray tubes	Information processing systems such as CRT-based video display terminals; CRT-TV monitors	10-50 kHz
Communications	Fixed systems; troposphere scatter; satellite communication; microwave point-to-point (relay); high-frequency radio. Mobile systems; CB radios; walkie-talkies	0.8-15 GHz; generally well controlled 27-800 MHZ; may produce high field strengths near antennae
Diathermy	Shortwave microwave	13.56 and 27.12 MHZ; 915 and 2450MHZ; may be continuous wave (CW) or pulsed wave (PW); consider duty cycle and leakage fields.
Dielectric heaters	Seal/emboss plastics; cure glues, resins, particle boards, and panels; bake sand cores; mold appliance covers and auto parts; heat paper products	1-100 MHZ; mainly 27.12 MHZ; may produce high E and/or H fields
Electronic Equipment	Switching regulator in copying machines, microcomputers, etc.	Usually shielded.
Electronic security systems	Intrusion alarms; theft detection; speed sensors; distance monitor; motion detection	Usually microwave frequencies
Electro-surgical devices	Cauterizing or coagulating tissues	May be CW or PW; solid state or spark-gap design
Hyperthermia	Same frequencies as diathermy	Applicators may be implantable
Induction heaters	Deep hardening; forging; welding; soft soldering; brazing; annealing ; tempering metals and semiconductors; heat and draw optical fibers; epitaxial growth; plasma torching	250-500 kHz and ELF; may produce high E and/or H fields
Lasers	Etching/engraving, welding, optical and other medical surgery, communications research	Gas, crystalline liquid and semi-conductor lasers
Microwave heaters (including microwave ovens)	Drying wood, paper, film, inks; thawing, cooking, baking, dehydrating, pasteurizing, and sterilizing foodstuffs; curing plastics; solvent desorption	915 and 2450 MHZ
Plasma processors	Chemical milling; nitriding steel; polymerization; modifying polymer surfaces; depositing and hardening coatings and films; etching, cleaning, or stripping photoresist.	0.1-27.12 MHZ; consider potential for exposure to plasma gases
Radar	Acquisition and tracking; air and auto traffic control; marine uses; surveillance	1-15 GHZ; usually PW
Spectroscopic instruments	Excite emissions from lamps/phototubes used in quantitative analysis	2.45 GHz
Welding	Production of pipe, tube, and beam; spot welding	RF-stabilized; 0.4-100 MHZ with harmonics

* Not all sources shown in this table are in the electromagnetic frequencies covered by ERTK.

APPENDIX D - Stress evaluation – heat

Heat stress may occur year round in areas with heat producing equipment such as in foundries, kitchen, or laundries. In Minnesota, high temperatures and humidity's are common during the summer with daily temperatures routinely varying up to 30 degrees. This variation does not always allow people to become acclimatized and stay acclimatized, thereby increasing the risk of heat stress.

Heat stress results from a combination of internal heat production from doing work and external heat exposure from the environment. Both aspects need to be addressed properly to control heat stress.

Two commonly used instruments to obtain heat stress measurements are the heat stress monitor and a sling psychrometer. The heat stress monitor measures several temperatures simultaneously and accounts for radiant heat and air movement. The sling psychrometer is a much cheaper and simpler device, but does not take into account radiant heat, and air movement must be determined separately.

The measurements obtained from either of these instruments are converted to one value, the wet bulb globe temperature (WBGT), for determining compliance with Minnesota Rules. WBGT is an index of heat stress indicating relative comfort. In considers temperature, humidity and air movement. The calculated value can be then compared to those found in Minnesota Rules 5205.0110, subpart 2a. (see this Appendix).

Minnesota Rules 5205.0110, subpart 2a, is the Minnesota standard for heat exposure. The standard is based on wet bulb globe temperature (WBGT) and level of work activity. Typically, one will determine the WBGT by using a heat stress monitor, or by using a sling psychrometer to obtain effective temperature, then converting effective temperature to WBGT. If the heat stress limit is approached or exceeded, Employee Right to Know requirements specified in Minnesota Rules 5206.0700, subparts 1 and 3, "Training Program for Harmful Physical Agents," and Minnesota Rules 5206.110, "Labeling harmful Physical Agents; Label Content," also apply.

APPENDIX E - Sources of information

This program manual was prepared using information provided by the following sources:

Minnesota Rules and Statutes
5206.0100 – 5206.2000
182.

Federal Regulations
29 CFR 1910.1200
29 CFR 1910.95 – 1910.97
29 CFR 1910.1030

Iowa Association of Municipal Utilities

American Industrial Hygiene Association

American Conference of Governmental Industrial Hygienists (ACGIH)

National Institute for Occupational Safety and Health (NIOSH)

National Toxicology Program (NTP)

Minnesota Department of Health – Environmental Health Division

Centers for Disease Control and Prevention

Occupational Safety and Health Administration (OSHA)

GLOSSARY

acidosis – a condition of decreased alkalinity of the blood.

ACGIH – American Conference of Governmental Industrial Hygienists, Inc.

action level – the exposure level which triggers some but not all requirements in certain OSHA standards.

acute toxicity – the adverse effects resulting from a single dose of or exposure to a substance.

alkali – any compound having highly basic properties.

anesthesia – loss of sensation or feeling.

asphyxia – lack of oxygen than thus interference with oxygenation of the blood.

asphyxiant – a vapor or gas that can cause unconsciousness or death by suffocation.

boiling point, BP – the temperature at which the vapor pressure of a liquid is equal to the surrounding atmospheric pressure.

BZ – breathing zone

carcinogen – a chemical that has been demonstrated to cause cancer in humans.

CAS number (chemical abstract service number) – an assigned number used to identify a material; the numbers have no chemical significance.

ceiling value, CV – the concentration that should not be exceeded during any part of the working exposure.

CFM (cubic feet per minute) – volume of air flow.

chemical pneumonitis – inflammation of the lungs due to chemical irritation.

CNS – central nervous system.

CO (carbon monoxide) – a colorless, odorless, highly poisonous gas, formed by the incomplete combustion of carbon or carbonaceous material, including gasoline. A chemical asphyxiant, it reduces the blood's ability to carry oxygen.

CO2 (carbon dioxide) – a colorless, odorless, incombustible gas formed during respiration, combustion, and organic decomposition and used in food refrigeration, carbonated beverages, inert atmospheres, fire extinguishers, and aerosols. High concentrations can create hazardous oxygen-deficient environments that can cause asphyxiation.

combustible – OSHA defines combustible liquid as any liquid having a flash point at or above 100F (38C), but below 200F (93.3).

conjunctivitis – inflammation of the conjuctiva, the delicate membrane that lines th eyelids.

corrosive – a chemical that causes visible destruction of or irreversible alterations in living tissue.

cutaneous – pertaining to the skin.

dermal – used on or applied to the skin.

dermatitis – inflammation of the skin.

dyspnea – a sense of difficulty in breathing; shortness of breath.

edema – an abnormal accumulation of clear, watery fluid in the tissues.

evaporation rate – the rate at which a particular material will vaporize from the liquid or solid state to the gas state.

f/cc – fibers per cubic centimeter of air.

flammable – describes any solid, liquid or gas that will ignite easily and burn rapidly. Has a flash point below 100F (38C).

flash point – the lowest temperature at which a flammable liquid gives off sufficient vapors to form an ignitable mixture.

FPM (feet per minute) – velocity of air flow.

grounding – a safety practice to conduct an electrical charge to the ground.

hazardous material – a substance or mixture of substances having properties capable of producing adverse health or safety effects.

hematuria – the presence of blood in the urine.

HEPA (high-efficiency particulate air purifying) – most efficient mechanical filter commonly available.

IARC – International Agency for Research on Cancer.

IDLH – immediately dangerous to life and health.

jaundice – yellowish discoloration of tissues.

LC 50 – the lethal concentration of a material in air that on the basis of laboratory tests is expected to kill 50 percent of a group of test animals.

LD 50 – the lowest published lethal dose that will kill 50 percent of a group of test animals.

LEL (lower explosive limit) – refers to the lowest concentration of gas or vapor that will burn or explode if an ignition source is present.

LFM or lfm (linear feet per minute) – velocity of air flow.

mg/m3 – milligrams of material per cubic meter of air.

mutagen – a chemical or physical agent that induces genetic mutations.

narcosis – stupor or unconsciousness produced by a narcotic drug or chemical.

NFPA – National Fire Protection Association

NIOSH – National Institute for Occupational Safety and Health

NTP – National Toxicology Program

odor threshold – the lowest concentration of a material's vapor in air that can be detected by smell.

particulate – small, separate pieces of an airborne material.

peak – maximum instantaneous allowable exposure for hazardous substances.

PEL (permissible exposure limit) – an exposure limit established by OSHA.

pH – the value that represents the acidity or alkalinity of an aqueous solution [pH 7 = neutral; pH 0 = strong acid; pH 14 = strong alkaline.]

ppb (parts per billion) – parts of material per billion parts of air.

ppm (parts per million) – parts of material per million parts of air.

psychotropic – acting on the mind.

pulmonary edema – fluid in the lungs.

pyrophoric – a material that will ignite spontaneously in air below 130F (54C).

Reactivity – a description of the tendency of a substance to undergo chemical reaction either by itself or with other materials with the release of energy.

reproduction health hazard – any agent that has a harmful effect on the adult male or female reproductive system of the developing fetus or child.

SDS – safety data sheet

sensitization – an immune-response reaction state in which further exposure elicits an immune or allergic response.

silicosis – a condition of massive fibrosis of the lungs causing shortness of breath.

skin – notation used to indicate possible exposure to a chemical by absorption through the skin.

specific gravity –

STEL – short term exposure limit.

subcutaneous – beneath the skin.

target organ effects – chemically caused effects upon specifically listed organs an systems.

teratogen – an agent or substance that caused physical defects in developing embryo.

TLV (threshold limit value) – a term established by ACGIH to express the airborne concentration of a material to which nearly all workers can be exposed day after day without adverse effects.

TWA (time-weighted average) – the expression for average exposure which accounts for fluctuating levels during a given time period.

UEL (upper explosive limit) – the highest concentration of a material in air that will produce an explosion.

unstable – tending toward decomposition or other unwanted chemical change during normal handling or storage.

vapor density – the weight of a vapor or gas compared to the equal volume of air.

vapor pressure –

vertigo – a feeling of revolving in space; dizziness, giddiness.

viscosity – measurement of the flow properties of a material.

water reactive – a chemical that releases a hazardous gas, often violently, upon contact with water.